

SENATE FINANCE COMMITTEE  
February 20, 2009  
9:07 a.m.

9:07:00 AM

CALL TO ORDER

Co-Chair Stedman called the Senate Finance Committee meeting to order at 9:07 a.m.

MEMBERS PRESENT

Senator Lyman Hoffman, Co-Chair  
Senator Bert Stedman, Co-Chair  
Senator Johnny Ellis  
Senator Kim Elton  
Senator Donny Olson  
Senator Joe Thomas  
Senator Bettye Davis  
Senator Gary Stevens

MEMBERS ABSENT

Senator Charlie Huggins

ALSO PRESENT

John L. Aho, Ph. D., Sc.D., Chair of the Alaska Seismic Hazards Safety Commission.

SUMMARY

^Presentation: Joint with Senate Education Committee  
Alaska Seismic Hazards Safety Commission by Dr. John Aho, Chair of the Alaska Seismic Hazards Safety Commission.

Co-Chair Stedman introduced Senator Elton as chair of the education committee. He stated the purpose of the meeting was to hear a presentation from Dr. John Aho of the Alaska Seismic Hazards Safety Commission. The commission was created by the Legislature in 2002 to recommend goals for seismic risk mitigation and policies to reduce the state's vulnerability in earthquakes. The subject of earthquakes is considered each year during the budget process.

JOHN L. AHO, PH. D., SC.D., CHAIR OF THE ALASKA SEISMIC HAZARDS SAFETY COMMISSION, informed that he was born and raised in Anchorage. He announced that he held a Ph.D. from Cornell University in aerospace engineering. He stated that he chairs the Alaska Seismic Hazards Safety Commission. The

presentation has an emphasis on the commission's focus on schools.

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Mr. Aho noted that Alaska experiences large earthquakes each year with potential for damage in both urban and rural areas.

Dr. Aho began with a PowerPoint summary of the Seismic Commission, "A Look at Current Activities With an Emphasis on Schools." (Copy on File). Slide 1 includes a "Presentation Summary."

- A brief history of the Alaska Seismic Hazards Safety Commission (ASHSC)
- ASHSC standing committees (with an emphasis on schools)
- An historic perspective of school failures and a look at resultant mitigation legislation.
- An Alaskan communities' experience

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Dr. Aho discussed the "History of ASHSC" (Slide 2):

- HB 53 established ASHSC in 2002
- 11 members
- Policy Recommendations
- ASHSC Goals
- Standing Goals
- Standing Committees
- Administered by DNR

Dr. Aho discussed hazard versus risk with the goal of mitigating potential risks. The commission has 250 years of combined experience in the area of seismic risk mitigation. He defined hazard as the expected occurrence of a future event and risk as the expected consequence of that event. The hazard always exists, but the risk changes substantially due to additional population and infrastructure. The effort of ASHSC is to mitigate that potential risk.

Dr. Aho discussed "ASHSC Standing Committees" (Slide 3):

- Insurance
- Schools
- Earthquake Scenarios
- Education and outreach
- Hazards Identification

- Response, Recovery, and loss estimation
- Post-earthquake planning
- Partnership

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Dr. Aho specified the importance of identifying fault lines and potential hazards. These fault lines must be identified before Alaska runs the gas pipeline.

Dr. Aho discussed the "Schools Committee Tasks," (Slide 3):

- Identify previously accomplished work
- Identify legislation affecting design and construction
- Examine current plan review/inspection procedures
- Examine Code provisions relating to schools
- Identify seismically at-risk facilities
- Identify and interview stakeholders
- Develop conclusions/recommendations and way forward

Dr. Aho referred to "Earthquakes in Alaska" (map), (Slide 4):

Earthquake risk is high in much of the southern half of Alaska, but it is not the same everywhere. This map shows the overall geologic setting in Alaska that produces earthquakes. The Pacific plate (darker blue) is sliding northwestward past southeastern Alaska and then dives beneath the North American plate (light blue, green and brown) in southern Alaska, the Alaska Peninsula and the Aleutian Islands. Most earthquakes are produced where these two plates come into contact and slide past each other. Major earthquakes also occur throughout much of interior Alaska as a result of stresses generated at the plate boundary.

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Co-Chair Stedman asked about the slip rate in Southeast Alaska. Dr. Aho answered that there were two inches per year of slip rate in Southeast Alaska.

Senator Gary Stevens requested information regarding building code requirements with regard to fault lines. Dr. Aho explained that base shear equations used in earthquake design are based on the proximity of facilities to potential fault systems. Certain fault lines are concentrated, but fault lines are not always identified. The state's instrumentation is limited due to Alaska's size.

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Senator Elton noted that the commission has a budget of \$10,000. He inquired about the roll of industry regarding resource extraction. He asked if ASHSC receives funding from industry as a portion of their mitigation or as the state's obligation.

Dr. Aho informed that the commission has the ability to receive funding from any viable source. The partnership committee is charged with seeking additional funding. When the state designs a building such as a school, certain codes are subscribed to. Industry does not have the same restrictions when they are spending their own money, yet they design to the appropriate codes.

Senator Elton stated that gas and oil development in Cook Inlet would require a permitting practice requiring mitigation for seismic hazards. He asked if the decisions were made internally or was data provided by state and federal government. Dr. Aho answered that industry accesses both avenues in completing their own studies and taking advantage of fault identification studies performed by the state. Information from private studies is not always easy to obtain.

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Senator Thomas commended Dr. Aho's work with such a small budget. He addressed the Johnson River Fault, which the proposed gas pipeline would cross five times. He noted that legislation did not exist requiring the exchange of information about fault line studies. He asked if it would be helpful to have a better working relationship with the Alyeska Pipeline Service Company. Dr. Aho answered that a better relationship with the Alyeska Pipeline Service Company would be advantageous, although information gathered about earthquakes and permafrost is often proprietary.

Dr. Aho explained Slide 5 illustrating the surface rupture during Alaska's earthquake in 1964. The earthquake lasted 5 minutes. An earthquake of the same magnitude today would cause substantial damage to a city like Anchorage.

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Dr. Aho discussed Slide 7 and the "School Seismic Hazard Map." Seventy-five schools have been identified in the vintage, construction type, and seismic location that warrant concern for future damage from a potential earthquake.

Dr. Aho noted that 27,000 earthquakes were recorded in Alaska during 2008. Fifty to 100 earthquakes occur in Alaska on a daily bases.

Co-Chair Stedman asked about depth measurements shown on Slide 9. Dr. Aho answered that depth measurements were illustrated in meters, and the shallower depths have the greatest risk potential.

Dr. Aho presented the "Rapid Instrumental Intensity Map for 1964 Anchorage Scenario" (Slide 10) illustrating the amount of damage that can occur following a large earthquake.

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Dr. Aho introduced instrumentation known as seismic sensors or EpiSensor accelerometers. After an earthquake, the instrumentation provides data regarding motion in a particular building. The data allows ASHSC to note whether design calculations were adequate following an earthquake.

Senator Elton asked if statewide standards exist for buildings. He asked if individual communities set their own standards. Dr. Aho answered that the international building code is used by major communities in Alaska. Within the international building code are substantial seismic requirements.

Senator Elton asked if standards vary for different municipalities. He asked which latitudes are applied by different municipalities.

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Dr. Aho answered that the universal building code is standardized and municipalities modify the code based on the risk.

Senator Thomas asked about the potential cost of the instrumentation leading to mitigation of future problems. Dr. Aho estimated the cost for the sensors, wiring, and data recorders at \$200,000.

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Dr. Aho explained the art of earthquake engineering consisted of proper engineering, with proper training and peer review. Structures, once designed must be properly constructed.

Dr. Aho discussed the 1964 earthquake and the improper location of a facility in an area with massive ground failure (Slide 11). Dr. Aho discussed the Anchorage High School following the 1964 earthquake illustrated on Slide 14, as well as a gymnasium roof shown on Slide 15 that collapsed in five seconds under massive snow loading. The school gym collapsed because of a design mistake.

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Dr. Aho explained that hazard identification was crucial to avoid building over active faults.

Dr. Aho continued with an explanation of changes in requirements following major earthquakes in California destroying 230 schools in 1933. The Field Act was initiated requiring major changes in seismic design procedures, peer review of all school structure design, and full time resident observation of construction. Since 1933, California has not had a major catastrophic failure of a school as a result of an earthquake.

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Dr. Aho illustrated Pertinent Legislation as shown on Slide 21.

- FEMA's Hazard Mitigation Grant Program (HMGP)
- FEMA's Pre-Disaster Mitigation Grant Program (PDM)
- National Earthquake Hazards Reduction Program (NEHRP)
- California (Field Act)
- Oregon, Washington, Nevada, Utah

Dr. Aho commented that the city of Kodiak decided to examine their community schools searching for potential problems in regard to seismic hazard. Kodiak hired a consultant and found several hazards in five schools necessitating major renovation. Kodiak received the prestigious award of excellence by the Western States Seismic Policy Council for their mitigation activity.

Dr. Aho discussed lessons learned:

- Recognition of the Problem
- Identification of Structures at Risk
- Prioritization of Mitigation
- Final Determination of Mitigation Projects

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Senator Olson asked about Alaskan International Airports and risks to airport buildings from a potential earthquake. He asked if the buildings were able to handle the effects of an earthquake. Mr. Aho believed that the structure of the airport buildings was adequate.

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ADJOURNMENT

The meeting was adjourned at 9:53 AM.