

home : local news : •HEADLINE NEWS
Wednesday, August 17, 2005

8/16/2005 11:17:00 AM
Email this article • Print this article

LNG expert warns of 'half-mile-wide' fire

Terrorist attack could cause devastation, visitor says

By KATE RAMSAYER
The Daily Astorian

Astoria, Oregon, U.S.A.

A terrorist attack on a liquefied natural gas shipping tanker could result in a spill that, if ignited, would create a fire a half-mile wide that could burn the skin of people a mile away, Jerry Havens, a chemical engineering professor at the University of Arkansas, said during a visit to Astoria Monday.

And while scientists are generally in agreement with those figures, **there is no federal regulation that sets boundaries or exclusion zones based on the threat of a spill on water,** said Havens, who has studied LNG for more than three decades.

Four companies have proposed building LNG receiving terminals along the Columbia River, two at sites in Warrenton, one in Bradwood just downstream of Wauna, and one at Port Westward in Columbia County.

“The public should not assume that the safety aspects associated with siting an LNG terminal are being sufficiently addressed by the government,” Havens said in an interview with The Daily Astorian. “I feel like it behooves them to educate themselves about what reality is.”

Havens also gave a talk on LNG safety and security to a full house at Astoria’s Performing Arts Center Monday night. In both conversations, he said that although LNG companies can use best-management practices, put in safety features and tout an impressive accident record, since 9/11 the risks involved with the industry have changed.

“When you have malicious intent, it changes all those rules,” Havens said.

Rapid spill

After two reports by the American Bureau of Shipping and the Sandia National Laboratories, most scientists are in agreement that terrorists could use available weapons to blow a hole in the side of an LNG tanker, causing a rapid spill of 3 million gallons, Havens said.

Although there are exclusion zones that the Federal Energy Regulatory Council requires based on models of LNG spills on land, models that Havens' work helped establish, there aren't any mandated boundaries in place based on what would happen if LNG is released on water.

But because there is no way to contain LNG on water, a spill from a ship is something that needs to be seriously considered, Havens said.

If millions of gallons of LNG is spilled on water and the rapidly evaporating fuel is ignited, it could cause a fire bigger than one anyone has ever studied, he said.

In the 1980s, scientists experimented with a test pool fire of 10,000 gallons of LNG, equivalent to what a tanker truck would hold. That resulted in a cone-shaped fire, 60 feet in diameter and 250 feet tall. There are technical difficulties with testing larger amounts of LNG, but by scaling up the results a thousand times to approximate volumes in a shipping tanker, scientists came up with the half-mile-wide fire scenario.

LNG evaporates immediately when it is warmed by contact with water, and natural gas will only burn if it makes up between 5 percent and 15 percent of the air around it. If there's no ignition source, the evaporated gas from a spill could form a vapor cloud that could blow downwind. Although it is lighter than air, a vapor cloud is still heavy because it is so cold, so won't immediately dissipate into the upper atmosphere, Havens said.

The fact that a cloud could travel with the wind, and could be ignited away from a spill, increases the minimum safety distance, he said.

"We're now talking about distances from about 1.6 KM to about 4.8 KM where somebody could be in harm's way," Havens said. Still, he said that a vapor cloud was unlikely in a terrorist attack, since the attack would probably spark a pool fire before a cloud had a chance to form.

'Violent'

While the Sandia report discussed spills of three million gallons of LNG and acknowledged the possibility of a greater spill, Havens expressed more specific concerns.

A pool fire "would be so violent and so large, I think there's a very high probability, almost a certainty in my mind, that it wouldn't stop there, that the ship would be further damaged and you'd have cascading failures and so forth, probably endangering the whole ship," Havens said.

A typical tanker holds 35 million gallons of LNG in a handful of separate tanks, and if 3 million gallons spill from one tank and ignites, the fire could envelop the entire ship and cause structural damage, possibly resulting in additional spills, he said.

Havens added that he and others haven't attempted to figure out what the effects of a cascading

fire would be, because there are so many unknown variables, like the timing of the different spills.

Still, he said the possibility of a half-mile fire, radiating heat that can burn a person a mile away, and a two- to three-mile potential traveling distance for a vapor cloud, should be a serious enough threat to encourage remote siting.

And because the threat is on a tanker ship, the safe distances move with the ship.

“This danger zone now is a traveling danger zone,” Havens said. “It goes with the tanker.”

In response to one woman at Monday’s meeting, who asked if she would get burns standing in Astoria, half a block from the Columbia River, if a spill from a passing tanker ignited, Havens said yes. The studies suggest that people a mile away would get second-degree burns on unprotected skin within 30 seconds; however, he added that people inside a building would be protected.

Questions

With these known dangers, Havens said, the question becomes how far away these LNG facilities should be sited so that they won’t hurt anybody. There are upwards of 50 new terminals proposed, and offshore facilities are becoming feasible, so distance from populated areas should be taken into account, he said.

“If we’ve got alternatives to siting in an area where the siting would bring into harm’s way a sizable population area, it ought to be considered,” Havens said.

He is working as a consultant for the city of Fall River, Mass., which is fighting the siting of a terminal there, and asking the U.S. Coast Guard to start a rulemaking process to set exclusion zones around tankers as they make their way to a facility.

He stressed that he was not taking a position on the four facilities proposed for the lower Columbia, but that his goal was to inform people of the threats that should be considered.

“I’m not trying to scare you,” Havens told the audience Monday. “I believe that we have to be realistic, and we have to know what we’re dealing with.”

- Stories highlighting the LNG saga are featured on The Daily Astorian’s Web site (Columbia River LNG Controversy)

Reader Comments

Posted: Tuesday, August 16, 2005