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Report cites risk of wide damage in LNG blast

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By Bryan Bender, Globe Staff | May 15, 2004

WASHINGTON -- A new government report says that a liquefied natural gas leak in Boston Harbor could catch fire and even explode, threatening people more than three-quarters of a mile away.

The report, commissioned by the Federal Energy Regulatory Commission, undercut a study for the Department of Energy in 2001 that led federal officials to restart LNG shipments after the Sept. 11, 2001, terrorist attacks. The new report said the earlier study did not take into account all the possibilities that could pose a serious environmental hazard.

The new report, by ABS Consulting, a risk assessment firm, concluded that if the tanker's hull and cargo tanks were successfully breached, a pool fire could burn victims up to 4,600 feet away. Such an event could cause "severe pain" within 13 seconds, second-degree burns within 30 seconds, and third-degree burns within 50 seconds of exposure, the report said.

The ABS report also concluded that in some scenarios, a leak could create a flammable vapor cloud that might travel several thousand feet before dissipating into a stable state. If the vapor leaked into a confined space inside the tanker or another structure, it could also explode.

In some cases, the rapid change in the fuel's temperature when it hits the water could cause an explosion even without an ignition source -- although the report said such a blast would likely be equivalent to one caused by a few pounds of TNT. (Liquefied natural gas is stored at minus 260 degrees Fahrenheit.)

"It suggests that some of the accident scenarios involve enormous fires that could cause deaths, severe burns to people several thousand feet away, and hot enough to burn wood and melt steel closer in," said Representative Edward J. Markey, Democrat of Malden. The main DistriGas LNG facility in Everett is in his district.

"In some scenarios, an explosion could occur. These are findings that seem roughly consistent with some of the previous studies, but they are still very sobering," Markey said.

Despite its alarming conclusions, the ABS report cited a "remarkable safety" record for the ships, which have been operating in the United States since 1959. DistriGas maintains that the vessels and offloading operations in Everett are safe. A DistriGas official who asked not to be named said yesterday that "LNG itself cannot explode, and the most likely scenario in any rapid release of the LNG from a vessel would imply that it would not become trapped anywhere, as it would be leaking rapidly into the water and vaporizing into the air, where it would disperse."

"I suppose there could be some scenario where some amount of gas could become confined and trapped inside a bulkhead [inside the ship]," the official said. "But if we're talking about a hole being blown in the side of the ship, it would seem automatic that there would be ample opportunity for the gas to escape and disperse, which actually is what you want."

After the Sept. 11, 2001, terrorist attacks, LNG tankers were temporarily barred from Boston Harbor. Boston Mayor Thomas M. Menino, who did not return a phone call yesterday, had sued in federal court to make the post-Sept. 11 ban permanent. The criticism of the tankers -- and fear that they could be target of a terrorist attack -- was renewed earlier this year after the FBI revealed that stowaways with links to Al Qaeda entered Boston on the tankers as far back as 1995.

The latest study is likely to renew calls to block the tankers, in part because the report says the 2001 study, which was conducted by Quest, a government contractor, did not use sufficient models to determine the worst-case scenario of a collision or attack that spilled LNG into the harbor.

"It rejects the modeling methodology used in the Quest study," Markey said. "This is important because

the DOE-funded Quest study was used by federal officials to argue for reopening Boston Harbor to LNG shipments following Sept. 11, and it has been cited by the [Federal Energy Regulatory Commission] in several regulatory proceedings around the country."

He added, "The fact that [the] contractor is now recommending an alternative methodology means that we need to go back and reassess what the worst-case accident consequences are and what they mean."

Like previous studies, the ABS report says that one of the most likely scenarios is a "pool fire," which would occur if the liquid begins to turn into a flammable vapor when it hits the water.

But that was not sufficiently addressed in the earlier report because that report did not take into accouint the effects of wave movement, wind, and currents, the ABS report said.

"The model results in lower estimates for both pool radius and total evaporation rate," according to the new study. "These results may be correct, but until the model is better developed and supported (experimentally and/or theoretically), a more conservative approach is recommended."

"The vessels have a remarkable safety record and provide an essential link in the movement of LNG from production locations to consumer locations," according to the ABS Consulting report.

However, the report added, "stakeholders recognize that there are possibilities for some serious incidents involving LNG carriers, particularly in light of increased awareness and concern about potential terrorist actions."

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