

North Dakota train explosion raises questions about oil transport safety

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A train carrying oil from the Bakken oil fields in North Dakota derailed near Casselton, ND, Monday, in the second major recent train derailment and explosion of Bakken oil.

A train of crude oil and a train of soybeans were passing in opposite directions when a car of soybeans derailed and hit the passing oil train. The oil train then derailed, leading to series of blasts that shook nearby residences and sent a tower of thick, black smoke into the sky.

By evening, thousands of residents within 5 miles south and east of Casselton were told to evacuate, and residents within 10 miles were told to remain indoors. Emergency crews worked overnight to put out the fires, allowing residents to return the next afternoon.

Luckily, neither the train crew or town residents were injured. If the blast had occurred inside Casselton, the story would have ended far worse. The crew of the oil train managed to escape the lead engines, which soon were burned into charred hulks by the fire. Early reports indicate that the crew of the soybean train, once stopped, heroically left their engines to board the rear engine of the oil train and pull some 60 cars of unexploded oil away from the fire.

The disaster follows a similar derailment and explosion of Bakken crude that occurred on July 6, 2013 in Lac-Megantic, Quebec, when a train ran away and derailed at high speed in the town. An enormous explosion followed, resulting in the deaths of 47 town residents.

The boom in Bakken crude oil production in the United States and Canada has led to a dramatic rise in transportation of oil by rail. Bakken crude is produced from a rock formation in North Dakota, Montana, Saskatchewan and Manitoba, with North Dakota as the leading producer. While traditional oil wells drill

straight down to access a region of oil, production in the Bakken region has required recent advances in the technology of hydraulic fracturing—where highly pressurized liquid is injected into rock to fracture (“frack”) it, allowing otherwise inaccessible oil and gas to seep out.

Using this method, oil production is relatively decentralized, with thousands of individual wells contributing to the region’s output. Oil is often transported by a pipeline running from the source to a refinery or port. Plans to build an extension of the Keystone XL pipeline from the Bakken region to the Gulf Coast has been stalled amid concerns over its environmental impact. In the meantime, Bakken production has expanded beyond the existing capacity of pipelines, leading to a rapid rise in the transport of crude by rail.

Rail is more expensive than pipelines, but buyers and speculators have found an advantage to its flexibility. Rail terminals and capacity can be expanded faster than a pipeline can be built, and the crude being produced can change destination on the whim of the markets.

Bakken oil is largely “sweet crude,” meaning that it contains a low percentage of impurities like sulfur, making it ideal for refining into gasoline, diesel, and other fuels. Much of the Bakken crude being produced is headed by rail to newly reopened or expanded refineries on the East Coast, which are switching away from higher-priced imported sweet crude, in the move toward “energy independence” championed by the Obama Administration.

In North Dakota, production has gone from under 100,000 barrels per day in 2008 to over 800,000 barrels per day in 2013, making it the second-largest oil producing state after Texas. Workers from across the country, facing mass unemployment, are taking their

chances to get high-paying industrial jobs at the wells, as truck drivers and at transload terminals.

Housing and social services have failed to keep up. Some workers end up paying exorbitant long term rates to stay in motels, or use RVs and campers in one of the coldest regions of the US. Rents have soared for local residents, and school districts are struggling to expand to accommodate new students. Residents also worry about the health effects of the chemicals used in the fracking process, which may be polluting the water table.

With the second major Bakken oil derailment and explosion, transportation experts and residents across the country are seeing the potential risk of the expansion of oil-by-rail traffic.

The National Transportation Safety Board (NTSB) arrived on Tuesday to investigate the explosion in Casselton, and said that its preliminary findings point to possible mechanical or equipment failures. Investigators found a broken axle, but the investigation is ongoing.

Aside from these issues, there is the question of the explosiveness of the oil. The July 6 derailment made clear that Bakken crude was far more volatile than producers and shippers had admitted.

An Irving Oil refinery in St. John, NB, Canada, was the intended recipient of the oil that spilled and exploded in Lac-Megantic. The *Globe and Mail* reported a representative of the refinery had said at an industry conference that the refinery was receiving tank cars that contained “contaminants,” “sludge,” and other “unknown substances.” Furthermore, the oil in a given car was sometimes combined from several sources, making it even more difficult to determine its makeup.

The presentation concluded that the makeup of the oil was not being properly identified and tested prior to shipment—which raised safety concerns—but despite that, the company continued to accept shipments and Canadian and US regulatory authorities did not institute rules that addressed the concerns.

In reaction to the latest derailment, on Thursday the Pipeline and Hazardous Materials Safety Administration issued a safety alert noting that “recent derailments and resulting fires indicate that the type of crude oil being transported from the Bakken region may be more flammable than traditional heavy crude oil.”

The wording of the statement makes clear that there was no rigorous investigation into the transport of Bakken crude prior to the rapid rise in its transport by rail and agencies are now working to catch up. Producers and railroads are not waiting for the results, however. Second quarter 2013 crude-by-rail shipments hit a record 117,509 carloads, compared to 53,163 carloads in the second quarter of 2012.

Aside from the chemical makeup of the oil, the initial NTSB comments on the Casselton derailment also indicated that the tank cars of the oil train are a notoriously unsafe design known as DOT-111. This design represents a majority of the tank cars carrying both crude oil and ethanol in North America, and lacks updated safety standards to reduce the risk of spillage or damage in the event of a derailment. Even the Association of American Railroads, an industry association, admits that only 30 percent of cars carrying crude meet the updated safety standards.



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