THE RAILROAD WEEK IN REVIEW

July 12, 2013

"When required, a sufficient number of hand brakes shall be applied to hold the train before the air brakes are released." -- 49CFR Part 238.231 (h)(3)

Montreal Maine & Atlantic's crude-oil train derailment-cum-explosion at Lac-Megantic, PQ may likely turn out to be one of the worst North American rail disasters in more than 20 years. The accident occurred shortly after midnight Friday, July 6; as of today, reports from the scene say about 50 people are either confirmed dead or are still missing. Fifty factories and businesses in the blast zone remain shut.

The flurry of news reports and pundit commentary immediately following the event, is, in my opinion, largely noise. What we really need to know is what went wrong, what do we do next, and how do we minimize the political fallout and damage to the industry. What follows are my observations about what led up to the event, collected from on-line news reports and two threads at www.trainorders.com. These cannot be taken as irrefutable facts but rather as indicators of what those closer to the action than I are saying.

The train was CP's 606 off the SOO in No. Dak. and was handed off to the MMA crew at CP's St. Luc Yard in Montreal en route to Brownville, Me. on MMA, destination St John, NB, with a consist of 72 crude-oil cars and one buffer car. Power was five units plus a caboose outfitted for remote control ops . A two-man crew runs St. Luc-Farnham, PQ; one-man crews work between Farnman and the Megantic, PQ crew-change point.

Because changing crews in Megantic would tie up the road crossings in town, trains are left at the long siding at Nantes, seven miles west of Megantic. The Farnham-based crew gets off there and is taxied to rest. A Brownsville crew is taxied to Nantes for the run east. The west end of Nantes siding is at the top of a hill. It's downhill to Megantic; I've read reports of 0.7 to 1.25 percent. The locomotives and the front end of the train at the east end of Nantes siding would be standing on the grade, most of the train on the flat.

The train stopped at Nantes about 2300. The MMA press release says the train "had been tied down and the single crew member had departed to a hotel for rest." Then -- apparently after the engineer had left the scene -- the lead unit caught fire, a passer-by saw it and called it in. The responders put out the fire, shut down the unit, notified the MMA dispatcher in Farnham and left.

MMA gives no details on what "tied down" means. CP Timetable No 6, April 2010, special instruction 7.6, "securing cars or engines hand brake policy" requires 9 handbrakes on a 70-79 car consist. 49CFR Part 238.231 (h)(3): "When required, a sufficient number of hand brakes shall be applied to hold the train before the air brakes are released."

The question of hand brakes is critical. Once the firemen shut down the unit, it could not keep the air compressor running and the train line charged. That's key because train line air does three things: it keeps the brakes off when fully charges, applies the brakes as pressure decreases, and keeps the air brake reservoir on each car charged. Reductions in train line air pressure cause air to flow from the brake reservoir to the brake cylinder, pushing on a piston that is linked to the car's brake gear and applying pressure to the brake shoes on the car's wheels.

If there's a sudden loss in train line pressure -- say a hose breaks between the cars -- the brakes "go into emergency," stopping the train. That is, as long as there is enough air pressure in the brake reservoirs to activate the brake cylinders. Train lines and brake reservoirs are not air tight and pressure "leaks off" over time if not replenished by the air compressor on the engine. How long it takes is a function of the state of maintenance on the individual piece of equipment.

That's why railroad rolling stock comes equipped with hand brakes, and why the regs are written as they are. The physics of the Nantes setup are such that the sheer rolling weight of a five-unit loco lash up and a couple of cars stopped at the top of a grade could conceivably drag an entire train that was parked on the flat down the hill with them once the loco brakes came off as a result of the shut-down.

The train started moving on its own about 0100 Saturday, reaching a reported speed of 62 mph when it started around the curve in downtown Megantic. The locomotive and the first five cars made the curve but the train broke at the sixth car and caught fire, leveling nearby buildings and killing scores.

Questions to ask in any subsequent root-cause analysis: Why did the loco catch fire? Why wasn't the engineer called? How many hand brakes were applied and where? If the train was indeed parked on a side track, was the switch back to the main aligned against the train? Is there a derail at the east end of the siding and, if so, was it used?

One thing railroads are good at is root cause analysis. After every event, analysis pinpoints actions to prevent a repeat, the mere existence of the Westinghouse Air Brake System PTC being a prime example.

The July 5 "Friday Freight" from Wolfe Research sheds some light on rail customers who receive bulk commodities by rail, then ship finished goods by truck. In this case, what appears to be a glass maker.

Wolfe writes, "Our contact currently uses the rails to handle 75 percent of incoming bulk shipments and trucks to move the remaining 25 percent. The transportation mix is reversed for outbound freight with trucks handling 95 percent of the shipments." The note suggests the customer in question is in the food container business, citing "slower glass bottle shipments" because a brewer customer is using more aluminum cans and fewer glass bottles.

Another clue that the subject customer is in the glass business, at least in part: “This shipper leases some of its rail cars, primarily covered hopper, and has seen lease rates go up over the past few years because of demand from the energy sector to move frac sand. However, lease rates today for covered hoppers are down maybe 5 percent year-over-year to around $600 per car per month as demand to ship frac sand seems to be at or near a peak."

STCC 14 industrial sand is well represented among Class II and III roads, and is an excellent example of raw materials in by rail, finished goods out by truck. Building products, ethanol, lumber, packaging paper, and animal feed are other examples of consumer discretionary and durable goods that come in by the carload and go out by the truck load.

CSX held and eight-day maintenance marathon or “Jamboree” July 1-8. Designed to complete work that would normally take 18 weeks, CSX pulled off this accelerated timeline by temporarily re-routing main line trains in portions of three southeastern states to give workers uninterrupted time for upgrades and repairs.

The timing of the maintenance takes advantage of historically lighter rail volume during the Fourth of July holiday week. This year the work zeroed in on key routes between Shelby, Ky. and Spartanburg S.C. and from Bostic to Monroe, N.C. Nearly two-thirds of CSX's network-wide system production teams, as well as division engineering teams, signal teams and bridge forces were involved.

They replaced or installed more than 64,000 cross ties and 150,000 linear feet of rail, while smoothing and shaping the track roadbed and ballast across 40 track-miles. CSX also upgraded highway crossings, coordinating temporary closings and motor vehicle traffic re-routing, through local government agencies.

The Jamboree is part of CSX's $2.3 billion capital spend for 2013, which I wrote extensively about in the Feb, 2013 *Railway Age*. Among my findings,

> CSX ramped up its capital expense plans by a whopping 64 percent in the 2009-2013 period. Four years ago, capex was a mere $1.4 billion, slightly more than 15 percent of revenues, including PTC (what CFO Eliasson calls a “1.7 billion capex overlay.”). Over that period, CSX increased revenue by a third, dropped the operating ratio to 70.6 from 74.9, and cut the Personal Injury ratio by 43 percent to 0.69 injuries per 200,000 hours worked, a record low.