Background Overview: Crude Oil by Rail in California

Projected Changes in Crude-by-Rail

The Governor's Budget states that <1 percent of the total crude oil processed by California refineries is shipped by rail currently, and projects that the figure will rise to as high as 25 percent by 2016. This projection translates to an increase from three million barrels per year by rail (now) to approximately 150 million barrels per year by rail (in 2016). The projection is based on information about projects that have been planned and/or permitted including the following:

Numbers for reference:

1 unit train = 100 tank cars (approx.)

1 tank car = 600-700 barrels (approx.)

100 tank cars = 60,000-70,000 barrels (approx.)

Permit applications submitted

- Bakersfield, CA: Alon USA Energy has submitted applications for permits to build a rail offloading system at its Bakersfield refinery. The new rail systems planned for the existing refinery site are estimated to allow offloading of an average of 150,000 barrels of crude per day.

- Benicia, CA: Install a rail car unloading rack, repurpose an existing tank to include crude oil service, and construct associated infrastructure, including rail lines, to allow Valero to receive crude oil by train in Benicia. The project would permit Valero to receive crude oil by train in quantities up to 70,000 barrels per day, but it would not increase the volume of crude oil delivered to the refinery because crude oil quantities delivered by train would replace crude oil quantities received by ship. The City of Benicia has delayed the release of the draft Environmental Impact Report (EIR) until mid-June.

- Pittsburg, CA: Modernize and reactivate existing WesPac crude oil storage and transfer facilities in Pittsburg, including a new rail car transload facility. Construction was planned to begin in 2014 and take 15 months. This facility is projected to handle up to 375,000 barrels of crude per day. The oil would subsequently be stored and later transferred to California refineries.

- Santa Maria, CA: In summer of 2013, Phillips 66 submitted permit applications to modify its rail loading and unloading systems at its Santa Maria, CA refinery. These modifications are designed to accommodate a greater number of unit trains unloading crude oil. Under the changes, an average of 44,762 barrels of crude oil would offload per day. A final decision on the project was delayed as of March 2014.

- Wilmington, CA: Valero submitted applications last year for a permit to build a rail car unloading system at its Wilmington, CA, refinery that will allow the import of approximately 60,000 barrels of diluted bitumen per day from Canada. However, recent information indicates that Valero has pulled the permits as the result of concerns related to the economic viability of the project.

Under construction

- Bakersfield, CA: Plains All American Pipeline LP plans a rail-to-pipeline facility just south of Bakersfield. Though the facility is designed to transfer 140,000 barrels per day, it is initially expected to take only half that amount, or 70,000 barrels per day.

Key terms in crude-by-rail

Unit trains vs. manifest trains

Unit trains operate as a continuous group of rail cars that move as a cohesive unit from one location to another, typically composed of about 100 tank cars.

Manifest trains are individual or small groupings of cars that can ship materials only when combined with other individual or small groupings of cars.

For crude oil by rail transport, unit trains are regarded as more efficient and a higher priority by oil companies because they require less cycle time and can transport greater quantities of crude. Thus, when creating new crude by rail receiving terminals, oil companies most commonly prioritize construction of unit train receiving areas rather than those for manifest trains.

DOT-111 tank cars: federal regulations

The DOT-111 tank car is designed to transport hazardous materials, including crude oil, by rail. There are currently about 228,000 tank cars in operation in the United States, and 92,000 carry flammable liquids such as crude oil and ethanol. Of the total DOT-111 tank cars in operation, approximately 14,000 meet industry safety standards enacted in 2011. The Department of Transportation is expected to release greater safety regulations this year, which could potentially phase out thousands of existing DOT-111 tank cars.

Canada recently unveiled aggressive regulation of these tank cars. On April 23, Canada set a strong deadline of May 2017 for the removal or retrofit of all legacy DOT-111 tank cars that carry crude oil or ethanol built before January 2014, in addition to the immediate removal of 5,000 existing tank cars that were deemed "sub-standard." The new regulations called for thicker steel sides and greater top fitting and head shield protection, aimed at greater crash-resistance.[1]

Despite recommendations for higher standards in the building of these tank cars from the US National Transportation Safety Board and the Railway Supply Institute Committee on Tank Cars, the Department of Transportation has yet to publicly reveal any new comprehensive regulations. It is expected that new standards will be unveiled later this summer, but potentially not finalized until the end of this year.

[1] http://news.gc.ca/web/article-en.do?nid=841119