

U.S. Department of Energy Report to Congress: Crude Oil Characterization Research Study (April 2020)



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The United States Department of Energy ("DOE") issued an April 2020 document titled:

Crude Oil Characterization Research Study ("Study")

The *Study* constitutes a required report to Congress.

The *Study* was mandated by legislative language in Section 7309 of the Fixing America's Surface Transportation Act ("FAST Act"). See Public Law 114-94. Section 7309 directed the Secretary of Energy to submit a report to Congress:

... based on the comprehensive study of crude oil characteristics with recommendations for regulations and legislation to improve the safe transport of crude oil.

The *Study* was required to be done in cooperation with the Secretary of Transportation.

DOE states that it commissioned the Sandia National Laboratories ("SNL") to undertake the research study. SNL is stated to have investigated whether crude oils currently transported in North America (including those produced from tight formations):

... exhibit physical or chemical properties that are distinct from conventional crudes, and further how those properties associate with combustion hazards that may be realized during transportation and handling.

DOE states the *Study* identified:

- Crude oil sampling and analysis methods that accurately characterized crude oil properties and then applied the methods to characterize oils burned in large-scale pool and fireball experiments
- The oils tested spanned a range of vapor pressure and light ends content observed among domestic conventional properties of common liquid hydrocarbon fuels that both overlap and well-exceed the vapor pressures of the crude oils tested

The *Study* defines as "key findings":

- The comparison of several commercially available, industry standard sampling and analysis methods to a baseline instrument system from the U.S. Strategic Petroleum Reserve indicated that several combinations of methods are sufficiently accurate for evaluating crude oil vapor pressure and pressurized whole oil composition. Thus, they were appropriate for use in characterizing the oils used in the combustion experiments.

- The similarity of pool fire and fireball burn characteristics pertinent to thermal hazard distances of the three oils studied indicate that vapor pressure is not a statistically significant factor in affecting these outcomes. Thus, the results from this work do not support creating a distinction for crude oils based on vapor pressure with regard to these combustion events.
- Based on comparison to combustion data from public literature on common liquid fuels, primarily commercial grade propane and butane, the results of this study are considered to be pertinent to crude oils and most hydrocarbon liquids that exceed the vapor pressures of the crude oils tested here.

The results of the *Study* included assessment of vapor pressure as affecting the thermal hazards from the combustion events. Based on such results, both DOE and the Department of Transportation found:

. . . that no further regulations by the Secretary of Transportation or the Secretary of Energy or further legislation is necessary to improve the safe transport of crude oil with specific regard to vapor pressure.

A copy of the *Study* can be downloaded [here](#).