Allen, William

From: Mark Tursa <Mark.Tursa@pgn.com>
Sent: Friday, May 15, 2020 5:18 PM
To: Allen, William
Cc: Jim VanLooven; Kim Lehman
Subject: [External_Sender] Information on Trojan hazard analysis

Chris,

I looked through the Sargent & Lundy hazards analysis more closely for heat flux issues at the ISFSI and this email summarizes what I found. I also had Sargent & Lundy review this information to be sure I wasn't mischaracterizing their analysis.

The analysis considers explosive hazards from transportation corridors near Trojan. The corridors include a rail line (Portland & Western Railroad, or PNWR) west of the ISFSI, a rail line (Burlington Northern Santa Fe, or BNSF) east of the ISFSI, and river traffic on the Columbia River east of the ISFSI. Although the analysis was for explosive hazards, the results also provide information applicable to heat flux hazards at the ISFSI as described in the following.

The first consideration is that fires on these transportation corridors do not represent a hazard to the ISFSI, as described in Section 2.2.3.3 of the ISFSI SAR:

> *Fires resulting from transportation accidents on I-5, the railway near I-5, or the Columbia River would be separated from the ISFSI by considerable distance and the Columbia River. Fires from transportation accidents on Highway 30 would be separated from the ISFSI by the recreation lake and reflecting lake. Fires from transportation accidents on the Portland & Western railway would be sufficiently far from the ISFSI to not have an effect on the ISFSI. Therefore, fires from transportation related accidents do not pose a hazard to the ISFSI.*

For clarity, the "railway near I-5" is the BNSF rail line described above.

This leaves only traveling vapor cloud explosions (VCEs) or traveling vapor cloud fires as a concern for heat flux at the ISFSI, since among solid, liquid, and gaseous chemicals only gaseous chemicals may be transported to the ISFSI during an accident. Also, Section 3.2 of the analysis notes that the terms Lower Explosive Limit (LEL) and Lower Flammability Limit (LFL) are used interchangeably since they are nearly the same.

Calculation Section 8.1.3 summarizes the results of the rail line VCE hazards analysis. Most chemicals screen out because dispersion analysis shows that the chemical falls below the LEL (and hence, LFL) when the cloud reaches the ISFSI. In these cases, there is no heat flux hazard since the chemical would not explode or sustain a flame in the presence of an ignition source. A total of six chemicals did not screen out in this process. For those chemicals, a probability analysis demonstrated that the probability of a vapor cloud reaching the ISFSI while at or above its LEL (and hence, LFL) was below 10^{-6} hazards per year. Based on this analysis there is no heat flux hazard at the ISFSI from these chemicals.

It could be questioned whether a chemical vapor cloud would present a heat flux hazard at some intermediate distance between the travel corridor and the ISFSI, since the cloud could be at or above its LEL (and hence, LFL) at an intermediate position. However, by inspection the heat flux would fall below that already analyzed in the Trojan ISFSI SAR. The limiting fire scenario involves a hypothetical spill of diesel fuel that ignites and burns for 6-7 minutes at a temperature near 1520°F. Clearly the heat flux from ignition of a remote vapor cloud would be of short duration and transfer less energy. I'll put a Trojan calculation about this scenario into the reading room I've established to assist the NRC in its review.

Calculation Section 8.2.3 summarizes the results of the river traffic VCE hazards analysis. None of the chemicals screened out using a dispersion analysis. For all these chemicals, a probability analysis demonstrated that the probability of a vapor cloud reaching the ISFSI while at or above its LEL (and hence, LFL) was below 10^{-6} hazards per year. Based on this analysis there is no heat flux hazard at the ISFSI from these chemicals.

In summary, there is no credible event from transportation accidents that would impose a heat flux at the ISFSI that is above that already described in the Trojan ISFSI SAR.

Please let me know if you have any questions on this information.

Mark