

PUBLIC PAGE

During this reporting period a detailed review of the literature related to modeling fires, and, in particular, LNG fires was undertaken. Literature on turbulent diffusion fires, modeling and experiments, LNG fire test data and empirical models related to calculating the thermal radiation field surrounding a LNG pool fire were reviewed. Specifically, the published test data from the largest LNG pool fire test in a diked area (of 35 m in nominal diameter), conducted in 1987, was reviewed as well as a 6 minute training film on the test produced by the organizers of the test. Also reviewed were the data and models used to predict hazard zones around other hydrocarbon fuels (gasoline, propane, etc).

The principal conclusions from the literature review conducted in Task 1 are:

- There is sufficient confusion in the literature as to the value emissive power of a LNG fires and its dependence on the size of the fire.
- The length of the visible flames correlation used in some of the Government reports are incorrect. Also, the emissive power value to be used in hazard assessment must be compatible with the correlation used to determine the height of the flame.
- Radiation from large fires can be modeled as coming from multiple zones, each zone (of some height) having different mean surface emissive power. This “zone” model is different from the current regulatory and commonly used models, which consider the fire as a single value emissive power zone.
- No models exist that describe the formation (quantification) of black soot and its radiation absorption or shielding characteristics in large turbulent pool fires.
- Jet fires resulting from LNG leaks from pipes and sides of storage vessels can be modeled relatively easily. Similarly channel LNG fires resulting from the flow of LNG in narrow channels and ignition can be modeled using experimental information available in the literature.

Technology & Management Systems, Inc.

102 Drake Road ■ BURLINGTON, MA 01803-1839 ■ Tel 781-229-6119 ■

□ E-Mail: tmsinc1981@Verizon.net □