

LNG INCIDENT IDENTIFICATION ANALYSIS

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ABSTRACT for WGC 2018

SUMMARY/CONCLUSIONS

Safety has been of utmost importance to the LNG industry since its inception. GIIGNL's Technical Study Group provides a forum where leaders from the LNG importing industry offer their Technical expertise to maintain high level of safety and improve efficiencies across the midstream of the LNG value chain. Exchanges among every GIIGNL member on safety issues allow contributing to maintain high level of safety records on LNG import facilities. A dedicated LNG incident identification analysis was carried out by a GIIGNL working Group covering Americas, Europe and Asia.

The LNG industry has operated worldwide for more than 50 years and has demonstrated a strong safety culture throughout the LNG value chain which has led to the LNG industry's exemplary safety record. Among GIIGNL working Group findings, the analysis showed that only 5.4% of the incidents studied resulted in injuries (mild or serious) or fatalities, incidents with fatalities representing 2% of this figure.

By far the most serious of these incidents was the well-known incident at East Ohio Gas Company's peak-shaving plant in Cleveland in 1944. This remains the only incident from those identified that resulted in injuries or fatalities to persons outside of the LNG terminal perimeter. This demonstrates the industry's commitment to safety, the adequacy of design and operating procedures and the suitability of applicable codes and regulations.

BACKGROUND

LNG is a mature industry accumulating very good safety records. The GIIGNL LNG Incident Identification analysis purpose is to provide a focus on the safety aspects of the LNG import industry. These analyses are a continuous focus within the Technical Study Group

Since the first LNG commercial cargo was loaded at Arzew (Algeria) and was delivered at Canvey Island (UK) by the Methane Princess on 12 October 1964, the LNG Industry has achieved a growth that the most optimistic pioneers couldn't have dreamed about. In 2015, the total LNG trade represented 245 MTPA, with regards to a fleet of 426 LNG carriers (excluding FSRU), for approximately 4050 loaded voyages.

AIMS

The goals of the analysis are:

- ✓ To identify LNG incidents and inform about LNG accidentology in LNG import terminals belonging to GIIGNL members, as well as peak shaving terminals, and import related equipment located in export terminals (like jetty, tanks and arms), including also some major public

incidents. The report also provides information about incidents related to LNG outside terminals, like ship incidents).

- ✓ To highlight tendencies with the aim of improving Hazard Identification and Hazard Analysis studies of new, modified or existing LNG facilities
- ✓ Highlight and promote the good safety record of the LNG industry.
- ✓ To help LNG operators to detect, prevent and mitigate possible sources of risk in their facilities

METHOD

Different overviews of the incidents were performed in order to allow cross-checking and derive the most complete conclusions.

Incidents were analyzed by:

- Type of releases (Releases of hazardous material, Near misses, Other incidents)
- Quantity of hydrocarbons released
- Areas in the regasification terminal (Unloading, Storage, Send-out, Equipment outside the control of the terminal) Type of equipment
- Causes (major immediate cause and primary Cause).

Finally, a focus was made on maintenance issues, leaks, procedures, design fault and recurrent incidents.

RESULTS

The analysis contributes to confirm the good safety records of the LNG industry. It shows, for instance, that only 5.4% of the incidents studied resulted in injuries (mild or serious) or fatalities; the incidents with fatalities represent 2%; and the impact offsite is minor with only 0.2%. Moreover, most of the incident which resulted in fatalities are related to LNG storage and occurred during the construction phase. The incident at East Ohio Gas Company's peak-shaving plant in Cleveland, Ohio in 1944 is the most serious one and the only one resulting in injuries or fatalities to people off-site the LNG terminal.