

Volume 16

A TDI-Brooks Publication

April 1, 2017

Non-Standard Operations

By Shannon Smith

As the oil and gas industry continues to evolve, so does TDI Brooks International. We are expanding our technical capabilities and searching for new markets and partnerships that can use our scientific services.

Wind farms, telecommunications and Automated Underwater Vehicle work are just some examples of how we are pushing beyond our traditional operations. Non-standard operations mean new ways of using our existing equipment and adapting to work with client technology.

All projects undertaken by TDI-Brooks must undergo proper risk analysis and HSE preparation in accordance with the Safety Management System prior to the start of the project.

This is particularly important for those projects which do not utilize standard operating procedures and JSAs.

The HSE preparation process includes completion of TDI's Hazard Identification and Risk Assessment, project specific HSE plan development and creation of task specific Job Safety Analysis and Management of Change assessments for activities outside of TDI's standard operating procedures.

While management handles the first two, the **JSAs and MOCs are handled at the field level**. As we said in our last issue, the guys doing the work are in the best position to know what hazards they will face and how to mitigate them.

Lack of proper risk assessment (JSAs) and hazard mitigation for non-standard operations is often a key root cause of major accidents.

As "non-standard operations" becoming more common, we need to **view every new operation as a high risk activity** and analyze before we act.

Non-standard operations and Major Accidents – breaking the connection

Kehinde Shaba, DNV-GL, 06 May 2016 (abridged)

Two striking features define most major accidents. The first is that they are most likely to occur during the operational phase. Second, they are often linked to a deviation from standard or normal operating conditions.



Smoke from the Buncefield Fire as seen from space. (The red dot is the marker for the city, not the actual fire.) Below is building damage nearest the explosion.



"Identifying Risks and mitigating them prior to work commencing is the cornerstone of our Safety Management System. This is crucial for all tasks, but especially those that we don't normally undertake. Take the time to go through the steps of our HSE process, and it will save a lot of heartache down the line."

James Howell
HSE Manager

Non-standard operations and Major Accidents – breaking the connection

These features are immediately evident to anyone who reviews the causal history of such accidents. At least four types of deviations can be identified.

- **Foreseeable**- for which an adequate response plan can be developed well in advance (e.g. those identified by a HAZOP)
- **Spontaneous**- (i.e. off the cuff) leave little time to develop an appropriate response. (e.g. unknown process upset)
- **Normal operations under differing environmental conditions** (e.g. at times of reduced manning, shift changeover or SIMOPS activities when attention is divided) can render the standard response inadequate.
- **Multiple deviations occur simultaneously**; independently they are well understood, but the combination presents a situation not readily amenable to easy comprehension.

Types 3 to 4 appear to be the ones most associated with major accidents. A common thread between all these is that time is needed to develop a well thought out and robust response.

That these deviations tend to occur during operations, when time is limited and the pressure to get the job done, presents a particular challenge. "Time is money", holds true in any process operation. **It is critical to carve out the time needed to develop an appropriate response while recognizing operational time constraints.**

One area that can be improved is the mindset with which they are approached. The lowest risk condition of a facility is when it is operating as normal (or as designed). **Any deviations should be assumed to significantly increase risk** and treated as such.

Case Study– Buncefield Fire

One incident in which non-standard procedures were a root cause of a major disaster occurred at the Hertfordshire Oil Storage Terminal in December 2005. An initial explosion registering 2.4 on the Richter scale was heard as far away as Belgium and France. The resulting fire spread to all 20 storage tanks. Subsequent explosions destroyed every window in office buildings nearby for blocks and the smoke cloud was easily seen from space.

The investigation determined that an oil storage tank was being used to store gasoline. The manual gauge to determine the amount of fuel was stuck and the automatic overflow shut off gauge was inoperative. That means the tank was being filled "blind" with no indication of the fuel level in the tank. The tank filled up, overflowed through the vents at the top and formed a vapor cloud near ground level which ignited and exploded. The resulting fires lasted for 5 days.