



TECHNICAL SAFETY SERVICES AND CAPABILITIES



ABOUT US

Sustainera Solutions is a firm, with offices In Azerbaijan, Georgia and United States, providing exceptional advisory, research, and capacity-building services to businesses, IFs, DFIs, government agencies, and multilateral organizations. Our mission is to help our clients transform their challenges into long-lasting and sustainable solutions.

OUR SERVICES INCLUDE BUT NOT LIMITED TO:



Process Hazard Analysis
(PHA) studies



Quantitative Risk
Analysis (QRA)



Escape Evacuation and
Rescue Analysis (EERA)



Fire and Explosion Risk
Assessment (FERA)



Occupied Building Risk
Assessment (OBRA)



Performance Based Fire and
Gas Detection Mapping studies



Safety Case
Development



Prestart-up Safety
Reviews (PSSR)



HSE and Process Safety
Management Audits



Project Health, Safety and
Environmental Reviews (PHSER)

Some of our services and capabilities to deliver these services are further described.

PROCESS HAZARD ANALYSIS (PHA) CAPABILITIES

PHA is a set of organized and systematic assessments of the potential hazards associated with an industrial process. A PHA can provide information intended to assist in making decisions for improving safety and reducing the consequences of unwanted or unplanned releases of hazardous substances. A PHA is often directed towards analyzing potential causes and consequences of undesirable events and focuses on equipment, instrumentation, utilities, human actions, and external factors that might impact the process.

PHA methods are qualitative in nature. The selection of a methodology to use depends on a number of factors, including the complexity of the process, the length of time a process has been in operation and if a PHA has been conducted on the process before, and if the process is

unique, or industrially common. With no doubts client's requirements, legal and corporate standards are also key factors in selection of PHA methodology.

There are a variety of methodologies that can be used to conduct a PHA, including but not limited to:

What if

Checklist

Simplified Desktop Safety Review (DSR) following Shell methodology

Hazard and Operability Study (HAZOP)

Hazard Identification (HAZID)



QUANTITATIVE RISK ANALYSIS (QRA) CAPABILITIES

Quantitative Risk Assessment (QRA) is a method which allows for quantitative estimation of risk, given the parameters defining them. The risk is calculated for the potential for safety, environmental or financial impact.

The method can be defined as a formal and systematic approach in identifying

hazardous events, estimating the likelihood of the hazardous event and the associated consequences.

Our consultants have years of experience and trained in using commercially available risk analysis tools such as DNV PHAST/SAFETI and Shell FRED/Shepherd software packages.

The following elements are typical to QRA studies:



Process Hazard Identification



Sensitivity Analysis



Location Specific Risk



Quantitative estimation of Hazardous Event Frequencies



Hazard Severity Assessment & Consequence Analysis



Risk Reduction Measure Verification



Frequency & Fatality plot (FN Plots), Cumulative FN Plots



Individual Risk Per Annum (IRPA) Calculation



System Narrative / Safety Requirement Specification



Potential Loss of Life (PLL) Calculations



Demonstration of Tolerable Levels of Risk and principle of As Low As Reasonably Practicable (ALARP)

ESCAPE EVACUATION AND RESCUE ANALYSIS (EERA) CAPABILITIES

In the event of a major incident, the design of a facility must be such that any ensuing risk to personnel can be assessed to a level considered to be As Low As Reasonably Practicable (ALARP). This can often be achieved through the provision of suitable means of Escape, Evacuation and Rescue (EER) in conjunction with the implementation of suitable emergency response procedures and training.



FIRE & EXPLOSION RISK ANALYSIS (FERA) CAPABILITIES

FERA refers to the estimation of the credible physical outcomes of loss of containment scenarios involving flammable, explosive and toxic materials mainly with respect to their potential impact on assets, safety functions and definition of active and passive fire protection system for process units and major equipment.

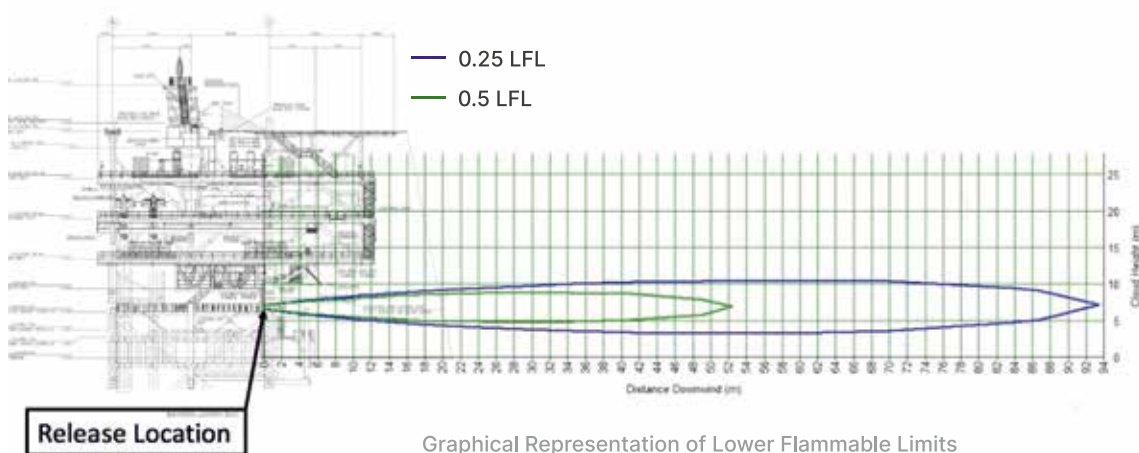
FERA studies are basically performed with widely used in industry DNV PHAST/SAFETI or Shell FRED/Shepherd software

packages but depending on the complexity of study (e.g. offshore installations) CFD analysis may also be performed.

SC mainly uses two widely used FERA methodologies which are:

Hazard (Consequence based) approach, and;

Risk based approach (simple or exceedance methodology)



OCCUPIED BUILDING RISK ASSESSMENT (OBRA) CAPABILITIES

Occupied Building Risk Assessment (OBRA) is a study used to demonstrate that people occupying buildings on process sites are adequately protected from hazards such as explosions, fires, chemical reaction fallout and toxic releases and that they can safely escape from those buildings.

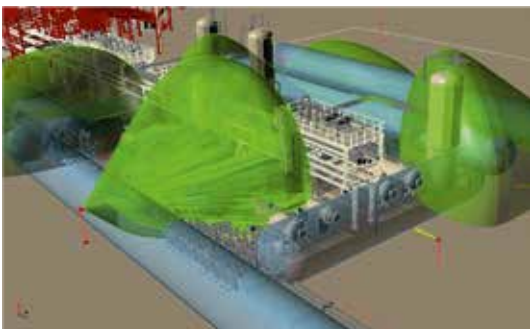


With the extensive knowledge and experience in the Occupied Building studies SC can be the right partner to determine how OBRA can be applied to the specific needs of client. We use our knowledge of process risks and their assessment to determine how OBRA can be most effectively applied to a site. We also ensure consistency in developing and documenting the OBRA assessment. We can assist at any stage in the process of assessing occupied buildings and review existing submissions to identify shortfalls.

FIRE & GAS DETECTION MAPPING STUDIES

Fire and Gas (F&G) detector mapping study provides an objective analysis of detector layouts to support the design method and optimize the amount of detectors required to satisfy coverage targets. F&G Mapping permits the designer to position flame and gas detection devices at intervals within the facility and assess the coverage afforded by the system. This can be mechanically correlative against pre-specified targets that the system should achieve. The outcome of this study also provides designers with the methodology and tools to review detection coverage against pre-determined targets, and guarantee that an appropriate and optimized system is commissioned.

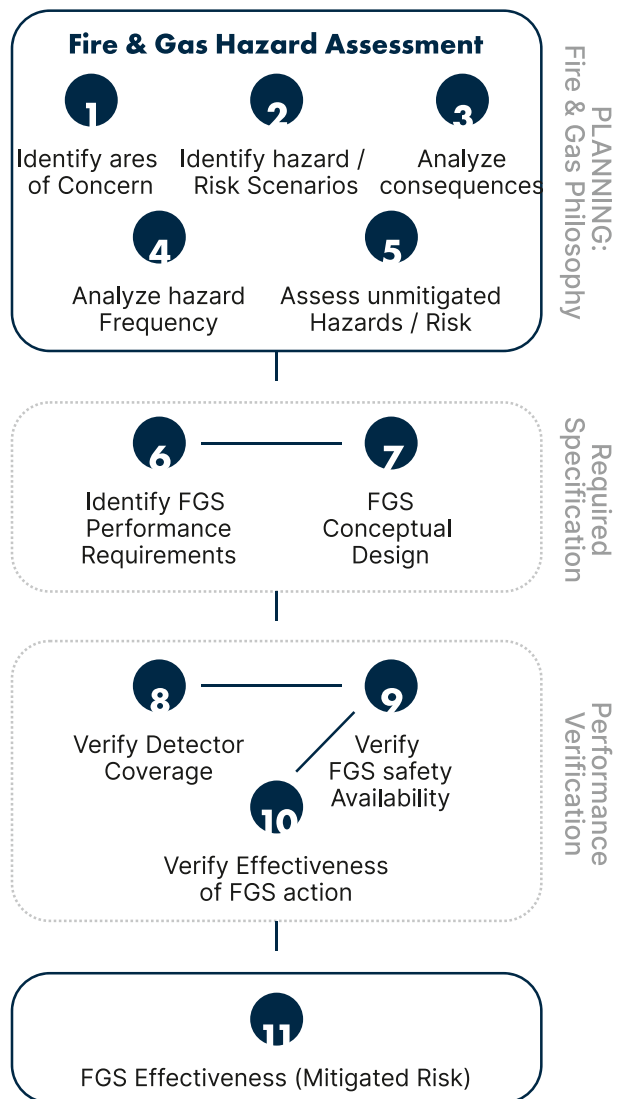
Example of 3D based flame and open path gas detection mapping with Detect 3D Software



We in SC have all the required competencies, resources and

access to most advanced software packages to offer our clients best in class services in the area of FGS assessment and design.


Performance based F&G detection mapping assessment consist of several steps. Those are presented in the following figure:






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