

# FRED

Fire, Release, Explosion & Dispersion

## Consequence modelling

**Developed for engineers by engineers, FRED is Shell's consequence modelling tool.**

Its vast range of fire explosion scenario models predict the consequences of accidental and design releases from process, storage, transport and distribution operations.

Based on empirical data, its intuitive, high quality interface enables the user to rapidly understand consequence prediction, providing an at a glance overview of the hazardous extents, such as blast waves, heat radiation, and gas concentrations.

Developed and validated through Shell's extensive programme of large-scale experiments, Joint Industry Projects, and published scientific literature, FRED has evolved over 40 years to become known and trusted throughout the world.

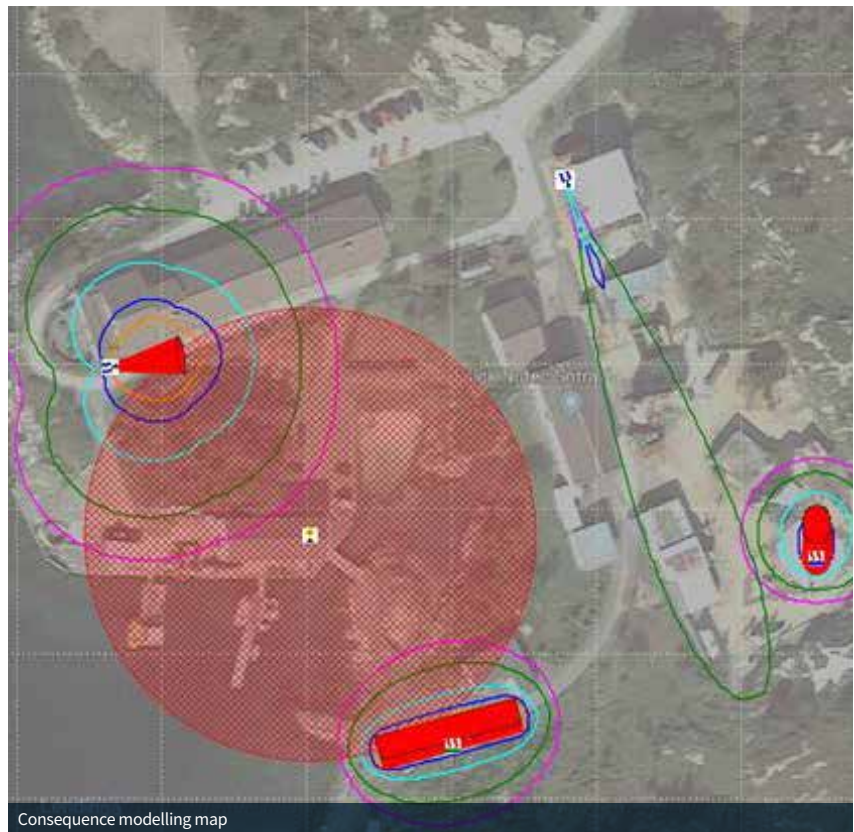
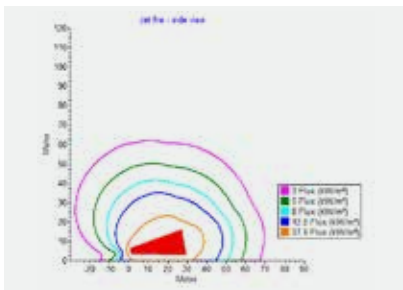
The software is underpinned by an advanced thermodynamic model which enables extended multi-component fuel representation to be used in nearly all models, the result of over \$2m investment.

Previously only available for use on Shell projects, it can now be universally applied to any facility, streamlining resources and maximising value.



## Key Benefits

- Draws on 40 years of R&D knowledge and Shell's operating experience
- Vast range of fire and explosion scenario models, including for escalation and smoke
- Intuitive, high quality interface with fast and reliable consequence predictions
- Transparency of the integrated models including detailed embedded Operational Guidance gives confidence on the reliability and consistency of the results



## Uses and applications

- Preparation and update of safety cases
- Justification for new design and operation
- Facility layout and equipment optimisation
- Pre-incident and emergency response planning studies
- Domino effects/escalation management studies
- Accident investigation
- Quantitative Risk Assessment (QRA) - with results directly integrated into Shell's QRA tool, Shepherd



### Gexcon

World-leaders in the field of safety and risk management and advanced dispersion, explosion and fire modelling.

### Shell

An international energy company that aims to meet the world's growing need for more and cleaner energy solutions in ways that are economically, environmentally and socially responsible.

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