

Introduction

MMI Engineering has specialist knowledge in the application of CFD for Nuclear safety and process applications.

The CFD team are highly experienced in the use of generalized CFD codes, such as CFX and Flacs, to solve problems associated with, hydrogen dispersion and deflagration, fire suppression, internal equipment flows, solids recovery systems, external building flows and thermal cycling in transport flasks. Only suitably qualified and experienced personnel (SQEP) are appointed to carry out nuclear analysis tasks.

Gas Release & Ventilation

Waste handling modelling experience includes:

- Validation studies on hydrogen release events
- Assessment of forced ventilation systems for dispersing hydrogen above waste silos in simulated release events

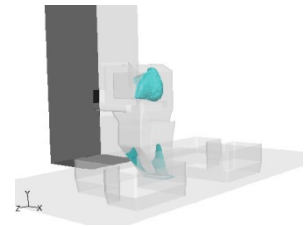


Figure 1: Isosurface of hydrogen concentration above a waste silo in a simulated release event

Fire Suppression

In situations where fire risk is possible then fire suppression systems may be used. Our experience includes:

- Addition of inerting gases above waste silos

MMI have extensive experience in the modelling of solid liquid systems gained in the water industry. These methods are applicable to sludge recovery problems in the Nuclear industry.



Figure 2: Delivery of Argon above a waste silo in a simulated fire event

Flask & Fuel Thermal Assessment

The safe movement of spent nuclear fuel often requires extensive analysis and assessment for safety case preparation. Our analysis experience includes:

- Thermal and flow assessments of flasks in normal transport
- Conjugate heat transfer modeling of flasks in fire events
- Phase change modeling to predict over pressure inside flasks in fire events

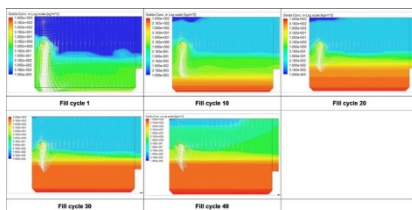


Figure 3: Delivery of Argon above a waste silo in a simulated fire event

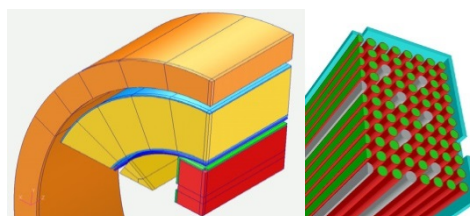


Figure 4: Model domain for the NTL-11 flask used in CFD thermal assessments