PROPOSAL – JOINT INDUSTRY PROJECT (JIP)

FLACS-Fire

CFD Modelling & QRA Methodology

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Motivation
Accidental fires represent a significant hazard to people, property and the environment. The potential consequences of hydrocarbon fires on offshore installations were clearly demonstrated by the Piper-Alpha disaster in 1988, and more recently by the Deepwater Horizon disaster in 2010. Experimental investigations of large-scale fire phenomena are inherently expensive, and extrapolation from experimental results is generally not suitable for site-specific safety studies. The <u>use of CFD for modelling fire and explosion phenomena</u> is gaining increased popularity as modern computers become increasingly powerful. This joint industry project aims to accelerate the development of the CFD tool FLACS into a state-of-the-art tool for fire simulations.

What is FLACS?
The FLACS software has been developed by GexCon for 30 years to become a leading CFD consequence tool for explosion and dispersion. GexCon is an internationally renowned company in the field of gas dispersion and explosion safety. FLACS is well-validated for explosion simulations and is widely accepted by authorities worldwide. The use of FLACS for explosion safety analyses offshore is recommended as a part of the NORSOK standard in Norway. FLACS has also been officially accepted by the US Department of Transportation as the first CFD consequence tool to be used for dispersion studies in connection to LNG facility siting according the NFPA-59A standard. FLACS is therefore an excellent starting point when developing a CFD fire consequence tool.

Benefits of using FLACS
-   FLACS is user-friendly and efficient compared to most other CFD-tools
-   FLACS has been extensively validated for explosion and dispersion studies in petrochemical facilities, and the same emphasize on validation will be employed for FLACS-Fire
-   Existing FLACS users will be able to use the same geometry models for dispersion, explosion and fire simulations
-   Existing FLACS users will get a significant discount on the fire simulator
-   There will be limited need for additional training for experienced FLACS users

Main goals of the project
FLACS-Fire will be developed into a robust state-of-the-art CFD tool for fire simulations, and methodology for a new *de facto* industry standard for quantitative risk assessment (QRA) related to fire hazards in the petroleum industry will be develop. FLACS-Fire is also intended to be used for studying fundamental phenomena related to fire dynamics, such as:
-   Jet and pool fires in petrochemical process plants, under varying atmospheric conditions
-   Confined or unconfined fires in congested geometries
-   Radiative and convective heat transfer to solid objects
-   Distribution of smoke and toxic products

Expected sponsorship level
JIP sponsors for the FLACS-Fire must commit to minimum 1 year (400 000 NOK). The total amount per participant will hence be 1.6 million NOK for the full period (4 years). Tentative JIP start-up in December 2012/January 2013.

Benefits of being a sponsor
-   Be a part of an international expert group on fire safety
-   Position your organization as a global leader in the field of fire safety and contribute to research and knowledge-building
-   Get the opportunity to take part in and influence the development process
-   Gain access to beta-releases as well as final commercial releases of FLACS-Fire
-   The right to prioritize 3 man-months R&D work in the voting process when prioritizing work for the next budget period.
-   Free access to company internal license level test versions of FLACS-Fire (+Dispersion) during the sponsorship period.
-   25% of the sponsorship funding can be deducted against future purchase of FLACS-Fire (and other FLACS-SW payments if excess deductions).
-   Simulation setups for tests in main validation matrix during support period

More information
The enclosed project proposal provides more details on the FLACS-Fire JIP. If you have any queries or are interested, please contact us using the contact information given on the front page.