

Project Information

Det Norske Veritas Finish Joint Industry Research Project on Gas Explosions

The project entitled "Gas Explosion Research Programme" which began in 1981 has been successfully completed at the end of 1983. The final report of the project has been prepared recently

The project was a natural continuation of the explosion research carried out by Veritas in previous years. The aim of the project was to develop knowledge of explosion mechanisms and factors affecting explosion behaviour, in order to improve the basis for selecting practical safety measures to reduce the consequences of accidental gas explosion

The possible consequences of an accidental explosion should be estimated at an early stage of an industrial project, because at this stage efficient safety measures can easily be applied. Safety measures may, for instance, include changes in general layout/arrangement, and removal of special equipment which may represent strong turbulence generation or a potential ignition source, etc. At an early stage of development, however, details are lacking and only the main dimensions and coarse input parameters are available. This has been reflected in the approach taken in the research project, and the explosion investigations have been designed to exploit the coarse information one will be faced with in practice

The project was guided by a Steering Committee

Members

Mr T K Authen
Dr J A Eyre
Dr G A Lunn
Dr Dag M Solberg (chairman)
Dr R A Mancini
(until end 1982)

Participating

Norsk Hydro A/S
A/S Norske Shell
Health & Safety Executive (U K)
Det norske Veritas
Amoco Norway Oil Co
(until end 1982)

Project manager

Jan A Pappas

Overall project responsibility

Dag M Solberg

The project has received continuous and substantial support from Forsvarets Bygningstjeneste FBT (The Norwegian Defence Construction Services). This organization provided both measuring and data processing equipment, as well as personnel at the test site, which has been of great importance to the successful performance of the project. This support by FBT is indeed highly appreciated.

A unique research programme was carried out, involving experiments in modules ranging from 0.5 m³ to 425 m³. Both theoretical and experimental investigations were tailored to achieve, in a cost-effective way,

results which can be applied to real-life situations on offshore and land-based installations

The results are presented for practical assessment of explosion loads, and include explosions in empty compartments as well as in compartments with different types of obstacles such as process vessels, pipes etc. The effects of vent area size, location of ignition source, obstacle type, size and location are accounted for

In addition, qualitative advice is given for the general layout of confinements which will help to reduce the consequences of an explosion. This relates to geometrical shape of modules, arrangement of vent areas, location of equipment, etc.

The basic philosophy behind the project approach has been verified, and the project has been carried out according to plan, both with respect to economy and time.

The project results form a sound basis for practical loss prevention work and represent a significant step forward in the understanding and estimation of accidental explosion loads and how to choose efficient measures for offshore and onshore industrial installations.