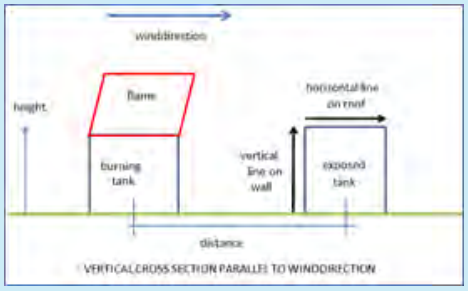
TRACK RECORDS RADIATION EXPOSURE EXTERNAL FIRES INDUSTRIAL PLANTS

Radiation levels on adjacent tanks due to storage tank and bund fires

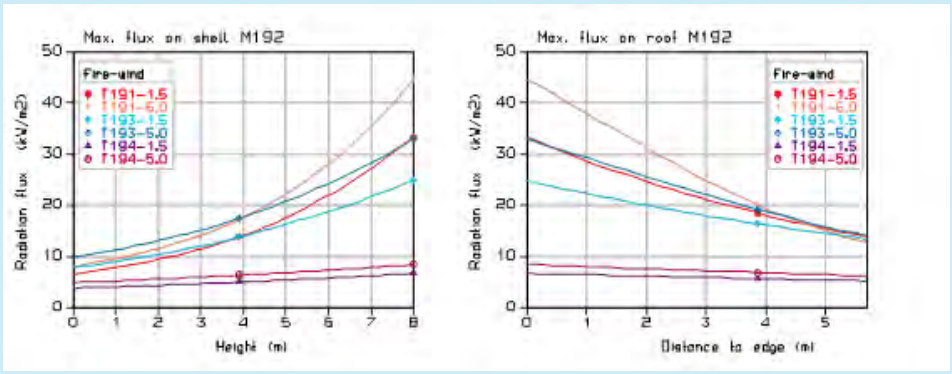
According to Dutch regulations storage tanks should be provided with a cooling system if they might be exposed to radiation heat fluxes exceeding 10 kW/m2 in case of an external fire in an adjacent tank or bund.

Efectis NL verified for all operational storage tanks of a large refinery in the Netherland, if this situation could occur. All relevant combinations of tank fire (either full surface or rim seal) and exposed neighbour tanks were identified and for all these combinations the maximum incident radiant fluxes on the exposed tanks were calculated for several representative wind conditions. The calculations were carried out with Efectis' in-house radiation code "Shadow" using a flame model described in the international accepted Dutch "Yellow" book.

The results of the calculations were reported in a set of graphs for each exposed tank. This set shows the incident radiation flux distribution on the tank wall and roof due to all relevant tank fires in its neighbourhood. An example of such a graph with a sketch showing the positions on the tank is shown below.



Sketch showing the position of calculated radiation fluxes on the tank wall (vertical line) and the roof (horizontal line) for a given combination of tank fire and exposed tank.



Example of distribution of incident radiation fluxes received by tank M192 on its wall (left) and its roof (right) due to a fire in tank T191, T193 or T194 for wind speeds 1.5 m/s and 5 m/s.
Note: for reasons of confidentially the values shown in the example differ from the actual calculated values.

Note: In the example additional cooling of tank M192 is required because of radiation from a full surface fire in tank T191 or T193.

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Efectis covers all fire safety capabilities and know-how in testing and modelling around the world with offices and laboratories located in France, the Netherlands, Spain, Turkey, North Africa and the Middle-East area.