



NATIONAL PETROCHEMICAL COMPANY  
STANDARDS

ENGINEERING STANDARD  
FOR  
FIRE FIGHTING SYSTEM

NPCS-ES-GC-10

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1 SCOPE

This standard describes the engineering requirements for fire protection system in an industrial complex handling hydrocarbon.

2 STANDARDS AND CODES

- NFPA National Fire Protection Association.  
(All Volumes).
- The Institute of Petroleum Refining Safety Code Part III (model code of safe practice in petroleum industry by "Institute of Petroleum" ).
- API American Petroleum Institute.  
  
API-RP-2001 Fire Protection in Refineries.
- UOP Standard (9-21-P)
- UL Underwriters Laboratories Inc.

3 DESIGN BASIS

- 3.1 Following design philosophy shall be used in designing fire protection system in an industrial complex.
  - 3.1.1 Fire protection system shall be designed assuming there will be no outside fire fighting assistance.
  - 3.1.2 The size and quantity of handling of hydrocarbon, type of plant and extent of hazard shall be decided by designer to insure the high hazard complex or ordinary hazard complex. However, refineries, petrochemical plants, fertilizer plants etc., are considered high hazard complexes and others are considered ordinary hazard.



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- 3.1.3 Fire protection facilities shall be designed by considering as single major fire philosophy in ordinary hazard complex and two major fire philosophy in high hazard complexes, as follows:
- a) Single major fire philosophy means that the fire protection facilities shall be designed to combat a single major fire occurred in the complex at any place in a single area. All the facilities shall be adequate.
  - b) Two major fire philosophy means that the fire protection facilities shall be designed to combat two major fires occurred simultaneously, at two places anywhere in the complex. All the facilities shall be adequate.
- 3.2 Mainly following facilities are generally considered for protection against fire in a complex.
- 3.2.1 Fire Protection for Process Units
- 3.2.1.1 Hydrants and monitors shall be provided all around and at strategic points to cover the whole area.
- 3.2.1.2 Manual operated water spray system shall be provided under air fin coolers, over pumps handling hot hydrocarbon with flash points below 60°C or recommended by process licensor.
- 3.2.1.3 Certain equipment/exchangers handling hydrocarbon with air cooling may be provided by semiautomatic, open head deluge system. This system shall be installed in consultation of process licensor by designer.
- 3.2.1.4 Dry risers with landing valves & hoses shall be provided over high rise platforms.
- 3.2.1.5 Mobile equipment and/or hose stations with suitable equipment may be provided around process units at strategic locations.
- 3.2.2 Fire Protection for Tank farm
- 3.E.2.1 Classification of Hydrocarbons shall be as given below as per institute of petroleum.
- |              |                                                                                               |
|--------------|-----------------------------------------------------------------------------------------------|
| Class-I      | Liquids which have flash points below 21°C.                                                   |
| Class-II (1) | Liquids which have flash points from 21°C up to and including 55°C handled below flash point. |