6.7 Pressure and vacuum protection

6.7.1 General

The various reference flow rates which shall be taken into consideration for sizing the boil off circuit and the pressure relief valves are defined in Annex B. They are applicable to each tank taken individually. Sufficient margin shall be provided between the operating pressure and the design pressure of the tank to avoid unnecessary venting.

6.7.2 Origin of the boil off gas in the tank vapour space

Irrespective of the means for recovery of boil off gas which might exist elsewhere (e.g. liquefaction, compression), the vapour space of the tank shall be connected to a flare/vent (see Clause 11), safety valve (6.7.3), or possibly a rupture disc (6.7.4) which is capable of discharging flow rates from any likely combination of the following:

- evaporation due to heat input in tank, equipment and recirculation lines;
- displacement due to filling at maximum possible flow-rate or return gas from carrier during loading;
- flash at filling;
- variations in atmospheric pressure (see B.7);
- vapourised LNG in desuperheaters;
- recirculation from a submerged pump;
- roll-over.

6.7.3 Pressure relief valves

The tank shall be fitted with over-pressure valves, plus one installed spare (n + 1 philosophy), directly relieving to the atmosphere except in cases where a vapour emission in an emergency leads to an unwanted situation as described in 4.5.2.1.c). In this case, the valves shall be linked to the flare network or vent system. The maximum flow to be discharged, at maximum operating pressure, is either the gas flow due to the heat input in the event of a fire or any likely combination of the following flow due to:

- evaporation due to heat input;
- displacement due to filling;
- flash at filling;
- variations in atmospheric pressure (see B.7);
- recirculation from a submerged pump;
- control valve(s) failure;
- roll-over, in case no other device is envisaged (for example see 6.7.4).