Provisions shall be made to avoid air pockets during pressure testing.

Drains shall be provided on all casings.

Drain lines shall be brought out to the edge of the base plate and individually valved.

Vent connections shall be provided with valves.

Valves shall be grouped and accessible within reach from the operating floor level.

Drain points shall have a second barrier against leakage or accidental emptying.

Systems and equipment shall be designed without pockets to avoid foreign matter accumulation.

Traps, strainers or filters shall be used to capture foreign matter detrimental to the equipment.

5.1.4 Mechanical design

Systems or equipment which are dependent on liquid supply at emergency or other run-down situations shall be provided with emergency supply for the necessary period.

Flow and rotation direction shall be permanently marked.

Equipment located on floating production units shall be designed for wave-induced fatigue.

Renewable sleeves under seals shall be removable on site without the application of heat.

Material for external bolting of 10 mm and smaller shall be corrosion resistant steel. Larger bolting shall as a minimum be hot dip galvanised low alloy steel. Submerged bolting shall be compatible with the base metal. Bolts shall be in accordance with ISO 262.

All equipment shall have a material handling procedure. When manhandling cannot be expected, handling and lifting devices shall be provided or clearly defined.

Couplings shall not contain wear parts and shall use forged steel. Dampening couplings can be differently designed.

All rotating couplings shall be shielded by structurally strong coupling guards. Non-sparking guard is required in classified zones 0, 1 and 2.

Limitation of the noise emission from the equipment shall be specified. Special considerations shall be given to noise limitations during design of equipment.

5.1.5 Nozzle loads

Equations below, gives forces and moments induced from package external pipework, which shall be minimum allowance in the calculations.

$M = 4x(DN-25)^{1.4}+2x10^{-5}xPNx(DN)^{2.7}$[Nm]

$F = 7.5x(DN)^{1.2}+0.1xPNx(DN)^{1.2}$[N]

PN in bar and DN in millimetres.

Forces and moments are acting at the nozzle to shell junction and at skid edge for piping nozzles. The equations does not apply to equipment nozzles within package units interconnected to each other with Supplier's piping.

The moment 'M' (Nm) and the force 'F' (N) shall be applied simultaneously in:
- two perpendicular directions at the right angle to the axis of pipe or in the plane tangent to the pressure retaining part at the nozzle-to-shell interface;
- direction perpendicular to the above plane.

Whenever relevant, the stress analysis shall be done both for the radial force pulling outwards together with the internal design pressure and for the same force pushing inwards with zero pressure resp. vacuum.

5.1.6 Design loads

The equipment shall be designed taking account of all relevant loads listed in codes and data sheets, and include the effect of field hydrostatic tests, wind, explosion blast pressure, acceleration, connected piping, transportation and installation.

5.1.7 Testing

Hydrocarbon gas containing equipment shall be tested with gas for leakages.

All equipment shall be subjected to FAT under realistic conditions according to accepted procedure.

All registrations necessary to demonstrate adherence to requirements or needed as reference for maintenance/surveillance shall be electronically stored and be available as print-out or curves.

All noise tests shall be performed in accordance with listed standard INSTA 121 and ISO 9614-2.

Changes or repairs as a result of failed tests require retesting if the performance or function may be affected.

A complete performance test dossier shall be produced immediately after acceptance.

5.1.8 Cleaning and preservation

The equipment shall be delivered fully cleaned and flushed for immediate service.

The equipment shall be properly preserved for transport and storage.