MITSUBISHI HEAVY INDUSTRIES COMPRESSOR CORPORATION

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C-S-019 / 796-94431

Application of dry gas seal

REASON FOR SUGGESTION:

The advantages of dry gas seals over wet seal systems can be defined as follows.

1) No Wear

Seal wear is avoided, because the seal surfaces are separated by a thin film of gas while the shaft is rotating. This greatly increases reliability and reduces seal maintenance to a minimum.

2) No Oil System

In dry running seals, the complex, heavy and expensive oil supply systems are replaced with clean & compact control system. As well as space and weight savings, capital costs can be reduced. The dry lubricated system cuts maintenance and removes the need for lubricating oil.

3) Low Power Consumption

Wet lubricated seals generally absorb significantly more energy in the form of viscous shear. Dry lubricated seals offer virtually no resistance reducing frictional losses by up to 98%, and lead to significant power savings, as a result.

4) Improved Rotor System Stability

Traditional oil ring seals may cause unpredictable excitement of the shaft and rotor instability. Dry gas seals are very predictable and will not affect rotor stability.

5) Improved Operational Safety

Elimination of the wet seal system improves operational safety by eradicating any dangerous build up of hydrocarbon gas in the seal oil.

DETAILS OF SUGGESTION:

The application of dry gas seal system is recommended.

In case of the existing compressor equips oil film seal, seal oil console shall be replaced with dry gas seal control system. Also, some modifications are required for the existing rotor and casing.

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TYPES OF DRY GAS SEAL SYSTEMS

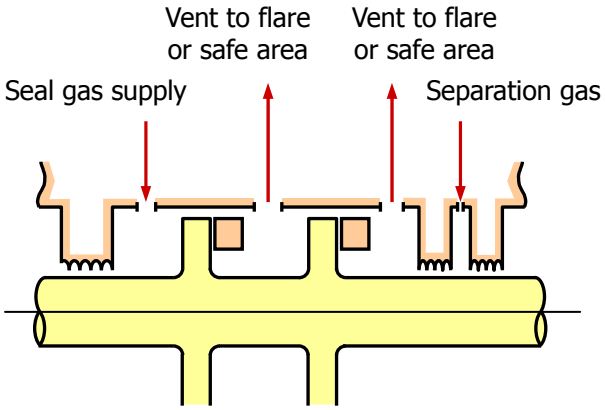

FIG.1 Tandem Dry Gas Seal

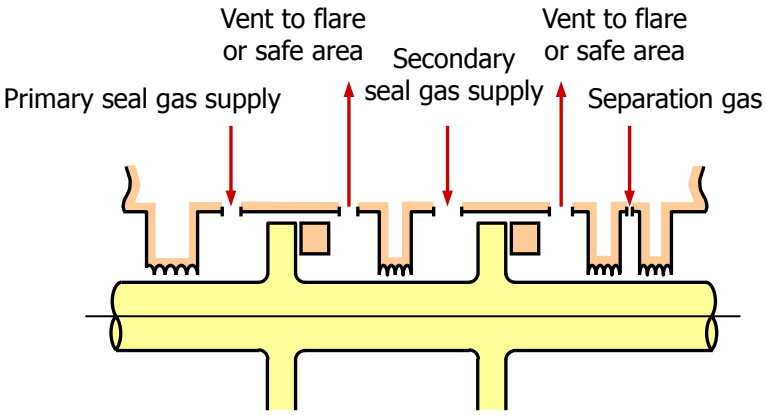

FIG.2 Tandem Dry Gas Seal with Intermediate Labyrinth Seal

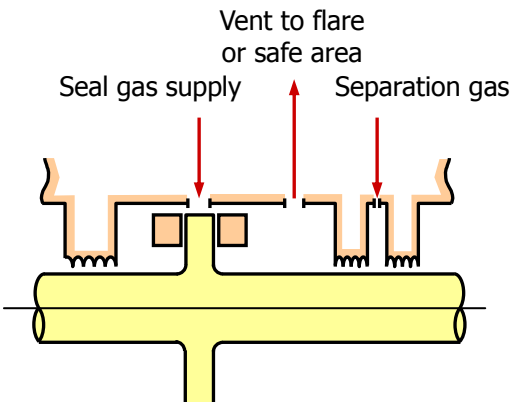

FIG.3 Double Opposed Dry Gas Seal

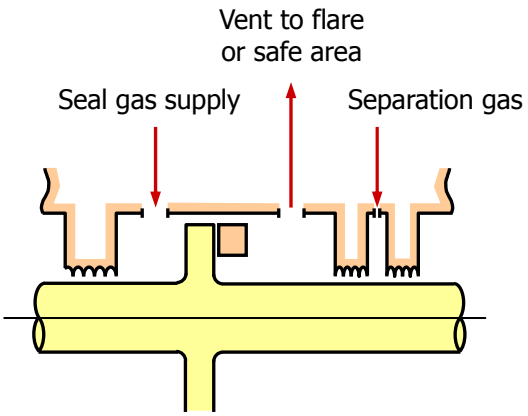

FIG.4 Single Dry Gas Seal

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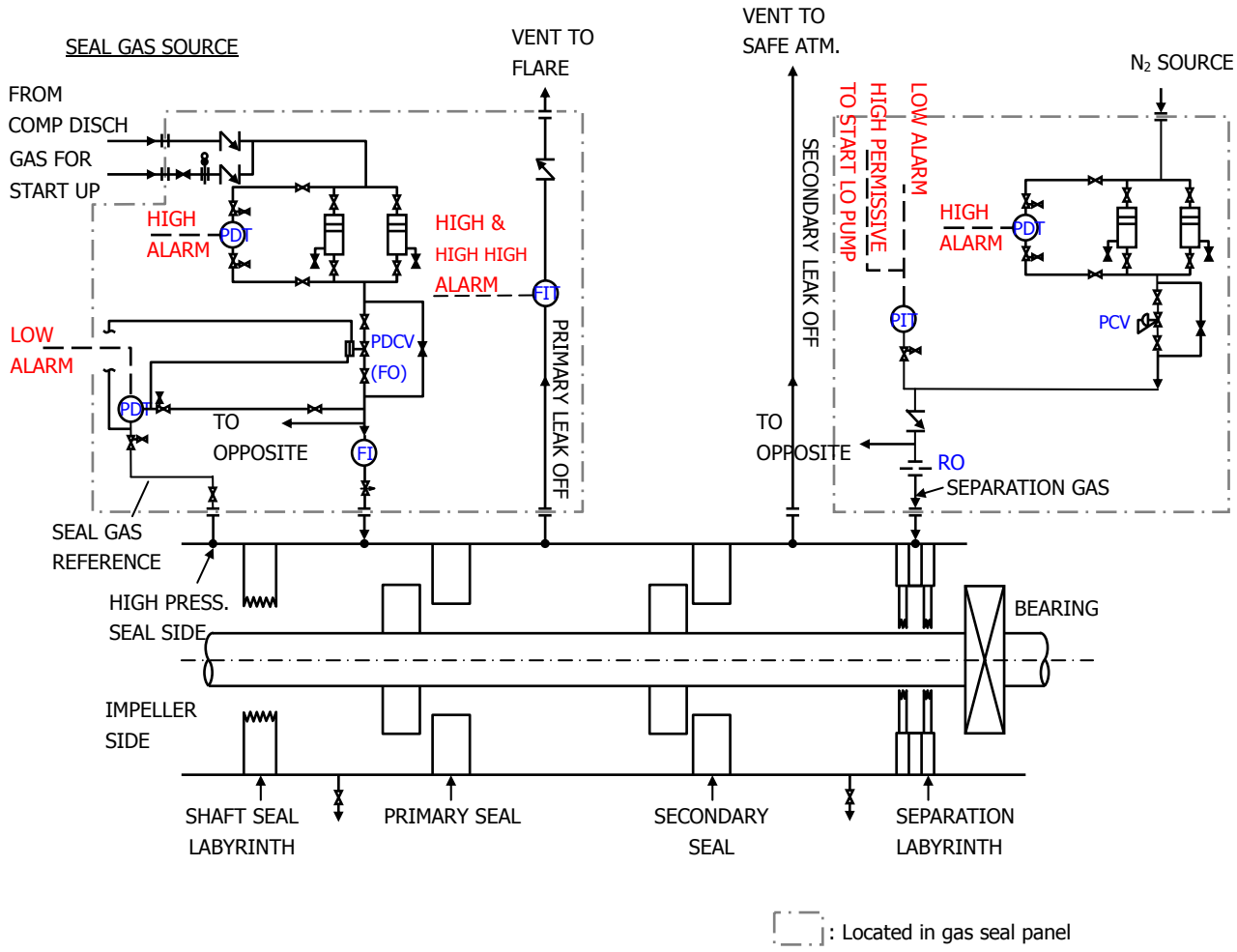
P&I for the typical dry gas seal system (Tandem dry gas seal)



Comparison table between oil film seal and dry gas seal

Item	Gas seal	Oil film seal	Comment
Leakage quantity	Small	Large	Small clearance
Energy loss	Small	Large	Seal oil pump, Seal mech. loss
Oil leakage to casing	Oil less	Possibility exists	-
At seal system stoppage	Seal function secured	No seal function exists	Gas relief required
Buffer gas at start up	Necessary	Not necessary	-
No. of equipment	Small	Large	Head tank, Trap, Pump
Space of system	Small	Large	-
Check points at operation	Less	Much	-

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