# Centrifugal Pump: Trouble-shooting Matrix

| Common Symptoms and Possible Causes | Common Symptoms | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | High Flow | No Flow | Low Flow | Unstable Flow, Pr, amps | Discharge Pressure too high | Discharge Pressure low | High Amps - input currant | Low Amps - Input currant | High Vibrations Or Noise | Mechanical Seal Leak / failure | High Bearing temperature |
| **Operational Check points** | | | | | | | | | | | |
| Back pressure or System resistance high. Control valve opening % less | | | | | | | | | | | |
| Back pressure Or System resistance low. Control valve opening % more | | | | | | | | | | | |
| High Specific gravity | | | | | | | | | | | |
| Low Specific gravity | | | | | | | | | | | |
| Higher Operating Temperature | | | | | | | | | | | |
| Lower Suction Pressure | | | | | | | | | | | |
| Higher Suction Pressure | | | | | | | | | | | |
| Clogged suction strainer | | | | | | | | | | | |
| Air Or Vapor entrainment / Not Vented / product tends vaporised | | | | | | | | | | | |
| Suction Valve is closed | | | | | | | | | | | |
| Closed disharge / Dis. heck valve installed in reverse direction | | | | | | | | | | | |
| Hidden flow / Spillback valve is leaking or open | | | | | | | | | | | |
| **Pump Related Check Points** | | | | | | | | | | | |
| Impeller Diameter is higher than the rated | | | | | | | | | | | |
| Impeller Diameter is smaller than the rated | | | | | | | | | | | |
| Rotor is seized | | | | | | | | | | | |
| Shaft is broken or shaeared off | | | | | | | | | | | |
| Pump Internals' are worn out / clearances are changed | | | | | | | | | | | |
| Rotor Unbalance / Misalignment / Bearing issues | | | | | | | | | | | |
| Rusting / pitting / deposition on wet end components | | | | | | | | | | | |
| Coupling not installed | | | | | | | | | | | |
| Quality or Quantity of lube oil is not proper | | | | | | | | | | | |
| **Seal and Seal plan related check points (Not in detail)** | | | | | | | | | | | |
| By pass flush flow (plan 11, 21, 31) is more, RO messing or oversized | | | | | | | | | | | |
| Seal faces are worn out | | | | | | | | | | | |
| Seal faces are over compressed | | | | | | | | | | | |
| Seal faces are under compressed | | | | | | | | | | | |
| Seal hang up / dynamic O ring hang up | | | | | | | | | | | |
| Leakage through elastomer sitting area (Various reason) | | | | | | | | | | | |
| Incorrect buffer, barrier fluid or its operating pressure or temperature | | | | | | | | | | | |
| Plan 13 - Orifice is missing or oversized | | | | | | | | | | | |
| **Electrical Check Points (Driver and Power supply)** | | | | | | | | | | | |
| Reverse rotation of driver | | | | | | | | | | | |
| Driver rpm is low | | | | | | | | | | | |
| Low Voltage / Imbalance voltage across 3 phases | | | | | | | | | | | |
| High Voltage / Imbalance voltage across 3 phases | | | | | | | | | | | |
| Motor internal issues | | | | | | | | | | | |
| Local ammeter calibration / functioning issue | | | | | | | | | | | |
| **Instrumentations check points** | | | | | | | | | | | |
| Calibration issue of Gauges / transmitters | | | | | | | | | | | |
| Instrument Venting issue or Malfunction | | | | | | | | | | | |
| Issue in configuration of transmitters output to PLC / DCS | | | | | | | | | | | |
| **Reliability and Condition monitoring** | | | | | | | | | | | |
| Issue with mounting surface of sensor where vibration being captured | | | | | | | | | | | |
| Temperature gun's reliability and sensitivity | | | | | | | | | | | |
| Human error in capturing vibration / temperature reading | | | | | | | | | | | |

Probability is more (Could be Predominant cause)

Probability is normal

Probability is less (Less likely but advisable to check)

Prepared By: Kirit Domadiya