

HAZOP Guide Words

Parameter/Guidewords	Deviations
Flow	No, Less, More, Reverse, Misdirected
Pressure	Higher, Lower, No, Reverse, Vacuum
Level	Higher, Lower, Varying, Fluctuating
Temperature	Higher, Lower
Composition	Changes in composition, Number of phases, Physical properties, Presence of impurities (e.g. air, water, acids, salts, corrosion products, lost circulation material, wax, hydrates), Contamination.
Breaking of containment	Construction, Operation, Maintenance
Viscosity	Higher, Lower
Connections	Temporary, Permanent, Added and removed, Overrides
Cracking	Thermal cracking, Stress corrosion cracking, Brittle fractures
Radiation	Thermal, Ionising
Foaming	Foam formation
Impact	External, Internal
Hammer	Steam hammer, Hydraulic surge
Vibration	Vibration, Critical speed
Elevation	Higher, Lower, Change in elevation
Noise	High
Velocity	High, Low
Catalyst	Regeneration, Change
Reliability	Instruments / Equipment
Conductivity	Water quality, Electrical
Other	Maintenance, Inspection, Start-up, Shutdown (normal and emergency) Failure of services (e.g. Air, electricity, steam, cooling water, hydraulic fluid), Sampling, Installation, Erosion, Corrosion, Temporary equipment, Experience of technique
Drawing	Errors, Revision, Availability