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Failure of Instrument Gas Tubing and Re-thinking for the Solutions

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Failures of instrument tubing continue to be a concern. Historical incidents reveal that two major causes leading to the tubing leakage incidents. The first one is a corrosion due to material selection and foreign particle contaminations on the tubing surface. Another one is a crevice corrosion underneath the tubing support. Failure analysis were carried out many times and it was concluded that the failures were because of pitting and crevice corrosion, but no evidences of chloride stress corrosion cracking (SCC).

904L is specified for tubing material instead of 316L in company specification. However, usage of 316L tubing and tubing failure cases still present in some turnkey skids and some deviated projects for short design life wellhead platforms for cost saving purpose. In some failure cases, the failure of 316L tubing occurred rapidly just prior to commissioning and start up. Corrosion underneath the tubing support is also reported in several cases even when 904L was used. Therefore, with updated technology and materials available, alternative solutions to solve both integrity and spend smart aspects are being studied.