

TEAM[®]

MBI Technical Bulletin

Single Stud Replacement Tool – Flange Safe.

Four Bolt flanges make up a significant percentage of flanges on site, often on systems that are hard to shut down and often in a poorer state of repair due to infrequent maintenance, inspection and poor torque tightening techniques. Whilst some oil and gas majors have adopted technologies that allow safe bolt change out* many have not due to internal procedures that prevent bolt change due to fears over increased bolt stresses, loss of gasket compression and the likelihood of critical failures.

The “flange safe” was developed through discussion with our customers utilizing our extensive on-stream repair experience to address joint integrity, whilst also addressing issues due to corroded nuts and bolts all encompassed within an ASME VIII Div 1 pressure retaining design.

The flange safe is primarily designed to maintain mechanical integrity during bolt change out, whilst preventing flange rotation, minimizing damage to the gasket and preventing the overloading of the remaining bolts. Tests using strain gauges show that these parameters can easily be maintained with gasket compression typically staying within 0.001” of its initial readings. Tests representing complete bolt failure (all bolts removed) show that the flange safe can still maintain an even gasket compression and maintain the full “class rated” pressure envelope. Furthermore, the experiences of bolt change out has been factored into the flange safe design to incorporate a manual nut splitter to aid the removal of seized nuts and during the bolt change out process the flange integrity can be monitored via a pressure gauge. Finally, if the flange assembly does leak the void can be injected within minutes to maintain joint integrity allowing the flange safe tool to be removed at the next available turnaround.

