

Technical Bulletin

Mixing of connections - definitions

Background

There are now quite a number of proprietary double shouldered connections that are designed to screw together with API connections. However, there is a lot of ambiguity and confusion with the terminology and what the make-up torques and combination working capabilities are. To further complicate matters, some proprietary connections can be screwed together with proprietary connections from other manufacturers.

The consequence of getting it wrong is a failed connection, and potentially a lost drill string - we have investigated a significant number of these where the root cause is a basic misunderstanding or misuse of a combination of mixed connections. The objective of this bulletin is therefore to offer some simple definitions to the industry..

There are significant differences between connections which can be defined as "Interchangeable" or "Compatible". Care needs to be taken when reviewing manufacturers literature because they do not adhere to the following definitions and often suggest that because their

connection screws into one supplied by a competitor, that they are interchangeable. This is not usually correct from an engineering perspective.

Definitions

Connections supplied by different manufacturers can only be regarded as "Fully Interchangeable" if their boxes / pins are identical and can be mutually substituted without any changes to the individual manufacturer provided performance properties or make-up torques (MUT).

Connections are regarded as having "Limited Compatibility" if their components can be correctly screwed together (i.e. have the same thread forms) & their seal faces engage, but any features that may be unique to either component are not fully functional. (For example material properties, additional seals, or torque shoulders). The resultant assembly therefore will have compromised performance characteristics. Use the MUT for the lowest rated connection.

"Incompatible" connections may have geometrical, material and / or performance characteristics

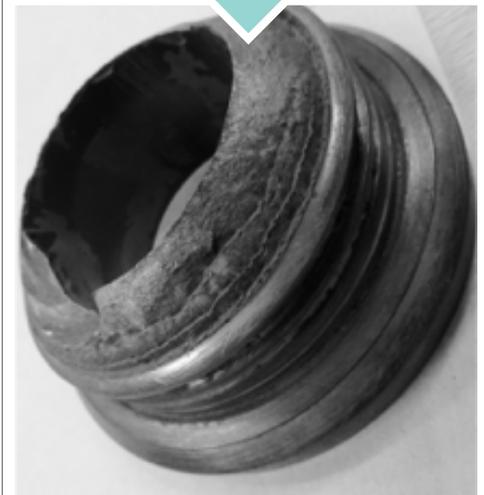
that could create unwanted interferences in the threaded and non-threaded areas. This may result in either not being able to make up the connections, and/or plastic deformation.

Conclusions

Mating connections together that have different "names" should only be done after careful engineering review (We can help, contact DSHELP@fp-g.com).

When mating a double shouldered pin with an API box, this is regarded as "Limited Compatibility" and care must be taken to ensure that the API box has been maintained correctly according to the recommendations in NS-2TM and the dimensions comply with those specified in API RP-7G. This will ensure proper primary shoulder sealing is achieved. In this case, the MUT will be reduced to that of the standard, single shouldered API connection. The value being determined, as standard, by the box OD & pin ID, with reference to NS-3TM Drill String Design Manual or API RP-7G.

This was a double shouldered drill pipe pin, crewed into an API box where the applied MUT was correct for the double shouldered drill pipe. The 'limited compatibility' combination lasted until a moderate overpull was applied.



More info:

For more information or assistance in defining working limits for mixed connections, contact Fearnley Procter Drill String Engineering at DSHELP@fp-g.com