



A BUREAU VERITAS COMPANY.

Summary of FEA Results

1. The results from this analysis indicate that the RFID tag hole does not compromise the structural integrity of the tool joint in terms of overall overload capacity and fatigue life.
2. From the analysis, it was determined that the pin connection was the weakest point in terms of overload capacity and not at the cross section where the RFID tag hole is located.
3. When the applied load exceeds the loading carrying capacity of the tool joint, the pin connection of the tool joint will first fail in an overload manner when compared with the cross section where the RFID tag hole is located.
4. From the analysis, it was determined that the pin connection is the weakest point in terms of fatigue life (cyclic loading/ number cycles to the failure) and not the RFID tag hole.
5. Typically, the drillpipe tube section is the weakest point in terms of overall load capacity when compared with the pin connection. This indicates that the cross section where the RFID tag hole is located is stronger than the drillpipe tube in terms of overall load capacity.
6. Similarly, the drillpipe tube section particularly near the internal upset region of the drillpipe is the weakest point in terms of fatigue life when compared to the pin connection. This indicates that the RFID tag hole has better fatigue life when compared to the drillpipe tube section.
7. From all the above, it can be stated that the RFID tag hole is not the weakest point on the drillpipe in terms of overall load capacity and fatigue life when compared to the pin connection and the drillpipe tube.