

MUD PUMP GEARING FAILURE ANALYSIS

PROJECT DESCRIPTION



A CLIENT WAS HAVING ISSUES WITH PREMATURE FAILURES ON THE GEAR AND PINION OF A 1,000 HP MUD PUMP. I WAS ASKED TO INSPECT TWO RETURNED UNITS, DETERMINE THE FAILURE MECHANISM, IDENTIFY ANY DESIGN DEFICIENCIES, AND RECOMMEND CHANGES TO THE DESIGN AND/OR PROCESS TO REDUCE THE LIKELIHOOD OF FUTURE FAILURES.

DESIGN NOTES

IT WAS DETERMINED THAT THE GEARING WAS PITTING IN A RELATIVELY SHORT AMOUNT OF TIME AND THAT A NUMBER OF FACTORS AFFECTED THE PITTING CAPACITY:

- AN EXCESSIVE AMOUNT OF THE TOOTH PROFILE WAS BEING REMOVED DURING DE-BURRING.
- THE HEAT TREATMENT WAS FOUND TO BE INCONSISTENT AND INSUFFICIENT.
- THE GEAR WAS DESIGNED AS A STUB-TOOTH DESIGN, FURTHER REDUCING THE PITTING CAPACITY.



PROJECT SUMMARY

I OUTLINED A PLAN TO HELP THE CLIENT IMPROVE THE MUD PUMP GEARING CAPACITY, WHICH INCLUDED:

- REDESIGN OF THE GEAR GEOMETRY TO IMPROVE THE PITTING CAPACITY.
- IMPLEMENTING A PLAN TO VERIFY MANUFACTURED GEAR AND PINION TOOTH QUALITY, HEAT TREAT QUALITY, HOUSING ACCURACY, AND ASSEMBLY ACCURACY.