HEAD OFFICE

MATTHEWS INTEGRITY HUB

FAILURE BRIEFING

EROSION FAILURE OF STEEL FLANGES

ROGUE MATERIALS

THE ARRANGEMENT

The photo shows an onshore drilling rig used in desert regions. The installation contains reciprocating pumps used to pump highly-erosive mud slurry at high pressure (350 bar+) down the drill string.

The drilling rig

The mud pump

THE FAILURE

The photo shows one of the flanges fitted in the slurry circuit after only a few weeks operation. It has clearly been eroded away by the abrasive fluid. Components in the slurry circuit are accepted as being replaceable components but normally last longer than a few weeks

The failed flange

THE CONSEQUENCES

Eroded flanges cause leaks and loss of pressure in the system. They can be replaced but require spares to be available, and pump downtime. In the case of multiple failures like this, the need for continual replacement can affect drilling operations.

WHAT WAS THE CAUSE?

What do you think caused this dramatic erosion? See next page for : **Failure Diagnosis and Lessons learned**

MATTHEWS INTEGRITY HUB

FAILURE BRIEFINGS

We think it is important in the asset integrity industry to **SHARE INFORMATION** on equipment accidents and failures. This is the main way in which people learn how failures can be prevented and that the same mistakes do not happen again and again.

Most causes of failure are well known and can be prevented by learning from things that have happened in the past

WE INVITE YOU TO PARTICIPATE

The more failure briefings we can show on these pages the better the chance of failures not repeating themselves unnecessarily. If you want to pass on details of failures you've experienced we will be pleased to edit them into our failure briefing format so they can be of greatest benefit to others in the plant integrity community.

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ROGUE MATERIALS : LESSONS LEARNED

THE DIAGNOSIS

Component subjected to erosive conditions need to be either lined with plastic/rubber etc or made out of erosion-resistant materials. The forged steel material used for these eroded flanges (there were a lot of them) was found to not have the correct specified hardness (HB) value as shown on the flange manufacturer's material test report (MTR). It varied from 30-40-% below the HB value shown. It was concluded that this was a major factor in its very short operating life under service conditions.

LESSONS LEARNED :How not to let it happen again.

Rogue materials that do not meet specification are commonplace in some countries. There's two bits of advice to follow:

Don't believe that manufacturers' material certificates are all true. Some were prepared by people who will just tell you what you want to hear.

Do additional mechanical tests (impact, hardness and tensile strength as a minimum) on material you buy before you use it even if the material specification or application code doesn't require them. Cut the test pieces and witness the test results yourself. That way you will know what you are getting.

Matthews Integrity Notes: HEAD OFFICE is **OPEN EVERY DAY....0730-2200 Monday-Sunday**...That's correct, all week, including holidays.

If we miss your call, leave a message and we will call you back just as soon as we pick it up. Sorry, there's no automated messages, call queueing, voice recognition robots or garbled music. Try it and see.