BRITISH DRILLING ASSOCIATION

What happened?

It has become an increasingly common issue that wire ropes, particularly on cable percussion machines, are popping or blowing strands just above the rope termination, as shown in the images below. The resulting damage is often incorrectly attributed to poor rope quality, when the actual cause is the lifting arrangement.

This damage has been identified as being caused by excessive torsional forces being imparted to the wire rope. This occurs when the drill string does not incorporate a properly functioning swivel (or equivalent free-rotating connection). As a result, rotational forces are transferred directly into the wire rope when it is under load. Wire ropes are designed to carry tensile loads, not torsional loads, and torsional loading therefore causes damage.

This issue is most commonly observed with new wire ropes, which are tightly wound and therefore more susceptible to torsional damage.

The BDA is committed to Improving Standards in Health & Safety, Quality of Workmanship and Technical Proficiency for the Drilling Industry and its Clients

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What went wrong?

Consequences

- Failure to allow free rotation can result in:
- Twisting and internal strand damage
- Bird-caging and/or "blown" wire rope
- Reduced rope strength and service life
- Sudden release of stored energy
- Increased risk to personnel and equipment

Outcome and Lessons Learnt

Recommended actions

ALL drill strings MUST allow the load and wire rope to rotate freely.

This includes:

- A serviceable swivel or free-rotating connection, which swivels under load, must be incorporated into each drill string
- These connections must be appropriate for the load, correctly rated, and properly maintained
- Confirmation that swivels are free turning under load, do not lock under load, and are not seized or ineffective must form part of the daily checks

Key Points

- A swivel is not an optional accessory — it is a critical safety component
- New wire ropes are particularly vulnerable to torsional damage
- A rope that cannot rotate will fail prematurely
- If rotation is restrained, rope damage is inevitable
- Stop work immediately if rope twisting or popping is observed

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