

Main ROV lift umbilical parted

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A Member has reported an incident in which an ROV umbilical parted, resulting in both the tether management system (TMS) and ROV falling to the seabed.

What happened?

The incident occurred during operations, when an ROV was being recovered from a dive using its winch and A-frame. The ROV and TMS were both later successfully recovered from their known position.

Our member's investigation revealed the following:

- The TMS and ROV package was raised to the A frame snubber assembly using manual winch control.
- Before engaging the umbilical termination socket into the latching mechanism, the latch indicator registered closed and the snubber skirt was in the raised position as per operating procedures.
- As the umbilical termination socket (bullet) was being engaged into the latching mechanism, the umbilical parted.
- Following the failure of the main umbilical, the TMS and ROV fell from the latch box.

On further investigation of the Launch and Recovery system (LARS), the following observations were noted:

- The winch was operating on the core of the drum due to an unusually short umbilical (300m). No line-pull limit was set on the winch drum, which would have been appropriate given the ability of this particular winch to pull in excess of the umbilical breaking strength on the core of the drum.
- One latch was found to be jammed in a partially open position by the mechanical flag indicator which had rotated and fouled on a section of the snubber frame.
- Both latch indicator proximity switches were found to indicate closed latch positions when the latches were in fact only partially closed. This could give a false indication on the winch remote control.
- One latch operating pin was found to be bent and the latch did not action smoothly (possibly as a result of the incident).

The causes of the incident were found to be the combined effect of:

- The unrestricted line pull of the powerful winch with a very short and relatively thin umbilical (7% of drum capacity).
- The improper functioning of the latches.

Our member noted that “modern deep water active heave compensated winches require high levels of installed power to enable them to successfully compensate for vessel movements, and to safely recover the package from up to 4000m. This capability is normally only required when the package is at depth. During recovery when the package is close to the surface the winch drum is normally quite full and the effective line pull of the winch is greatly reduced. This generally prevents the maximum torque capacity of the winch from being applied to the umbilical when the TMS is being engaged into the latching mechanism. In this case the very short umbilical resulted in the maximum line pull being applied to the umbilical when the package was pulled into the A-frame snubber.”

Our Member took the following corrective actions:

- Modified the unique latch mechanism and indicators of this (one-off) LARS to prevent improper function/false readings.
- Modified procedures to ensure maximum line pull settings are always below the breaking strain of the umbilical.

Members may wish to consider implementing a procedure to check that line pull is below the umbilical breaking strain, and if necessary, consider fitting some form of line pull control. This is particularly important in light of recent trends towards powerful deep water capable winches combined with thinner, lighter umbilicals with a lower breaking strain.

Care should be taken to ensure the line pull of the winch will never exceed the breaking strain of the umbilical, in circumstances which include:

- a powerful winch
- a thin umbilical
- short umbilical length.

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