



## Packoff Damage to Wireline

8/2014

In an attempt to inform our customers of operational trends or potential dangers that adversely affect their wireline operations, Camesa has issued the following technical alert to inform customers of a known hazard that has resulted in damaged cables during field operations.

In recent months, Camesa has received reports of parting of cables below the published minimum breaking force. Upon further investigation, these failures appear to be a result of inner armor wire breaks caused by loose armor wire conditions. One of the known causes of these types of failures can be directly linked to the “milking” of outer armor looseness through mechanical restriction of pressure control equipment on a moving wireline cable, mainly from the hydraulic packoff and accompanying rubber elements.

The action of milking a wireline at the packoff on a moving wireline collects the looseness dispersed through a cable and concentrates it above the packoff. When severe enough, this action can cause a situation where the outer armor layer is so loose that it is no longer working in tandem with the inner armor layer and the full weight of the cable is being supported on the inner armor wires exclusively (Fig. 1).

In this scenario, also known as a birds nest or bird cage, the published minimum breaking force is no longer valid as this figure is calculated when both the inner and outer armor wires are working together. When a wireline with this type of damage is placed under tension, the inner armors will break first at which point the outer armors are then the sole strength member in the cable. This is followed immediately by a shock load and the breaking of the outer armors which results in a complete failure of the cable. An example of this type of cable failure can be seen in figure 2 and calculated in the example below.

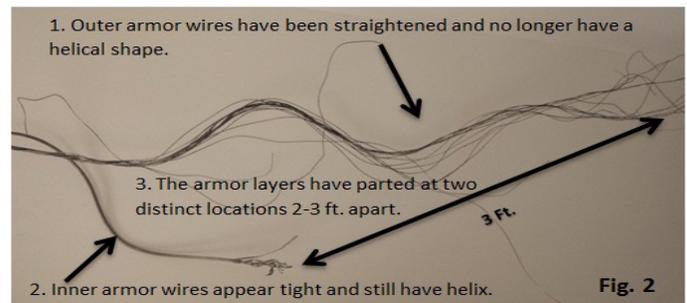
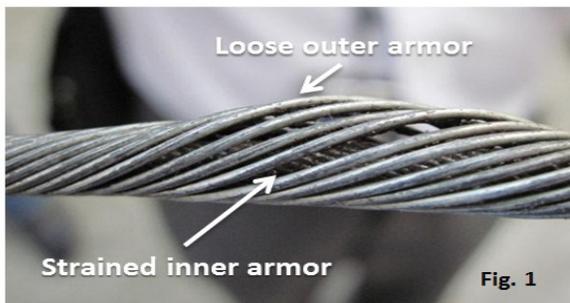
### Example:

**Cable Type:** 9/32” wireline (1N29PTZ-EHS)

**Armor Package:** 12/18 = 12 inner armor wires & 18 outer armor wires

12 inner armor wires / 30 total wires = **40% of total breaking strength contributed**

40% X 10,200lbs (Published Minimum Breaking Force) = **4,080 lbs.**



Therefore, the inner armor wires of this type of cable would break at 40% of the total published breaking strength. If enough tension is applied, in this case 4,080 pounds (assuming optimal conditions of the wires), the inner armor package will part due to a tension overload. The outer armor wire package will then unwind causing the wires to lose their helical shape and straighten. The outer armor wires will then be exposed to a shock load multiplying the tension being exerted and will subsequently break. This type of failure is referred to as an inner armor break.

### To help prevent premature failure due to loose armor conditions, Camesa recommends:

- Hydraulic packoff pressure should never be applied to a moving wireline cable
- New packoff rubber elements should NOT be used with new, unseasoned wireline cables as they fit tightly around a cable
- Flow tubes should be selected that are a minimum of .004 in. larger than the biggest diameter of the wireline
- Wireline cables should be inspected for looseness and tightened if necessary at a qualified service center routinely (every 20-50 runs depending on the type of operations and well environment the cable is subjected to).