Date	23rd March 2022	Prepared by	Harith
Latest Revision	30th March 2022		
Objective	To identify root cause of wire thinning issue (CWR-1288 SUPA75).		

Description of concern

Received report from night crew GuC on March 21st, 2022 by slickline operator Idlan. During random check on wire OD, he observed wire thinning at multiple spots. Reading varies at 0.087", 0.0975" and 0.0095".

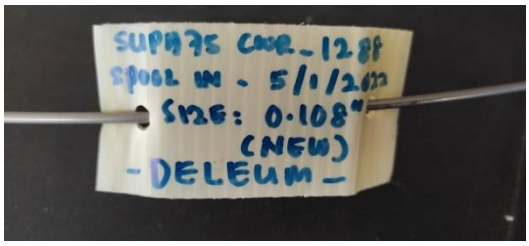
Potential Root Cause

Wire thinning may be due to corrosive attack, overload or heavy friction.

Action Taken and Findings

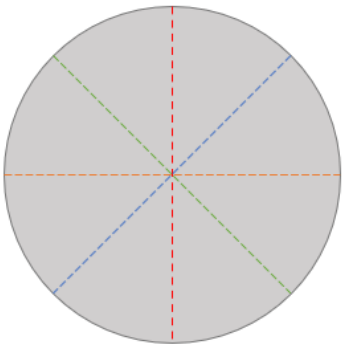
1. To enable operation progress, measures below are taken to ensure wire can be reuse:
   - Reconfirm on measurements at both vertical and horizontal axis of the wire. Operator confirmed on readings are below min tolerance.
   - Remove thinning length and remeasure wire OD until no reading below min tolerance (0.1068") detected. 280 ft of wire is removed.
   - Once wire is removed, around 5 ft of wire is cut to perform pull test and wrap test. Record pull test result and observe both fracture pattern and surface condition of wrapped sample.
     Results: Pull test value 2150lbs. Fracture pattern good (cup and cone shape). Wrap test good (no sign of cracks).
   - Redo rope socket and proceed to continue operation.
2. Consulted with DWS (wire manufacturer) for opinion and advise. Initial response as below:
   - The test results/inspection of the sample, 2150 lbs is acceptable - the "as new" breaking load was 2230 lbs/2222 lbs so the figure achieved on the portable tensile tester is within the expected range of error for the tester.
   - Localised thinning would have been caused by the operation, most likely a lengthy jarring campaign without cutting back.
   - Thinning could be caused by abrasion/mechanical damage or overload on a deflection point ***(refer Annex 1)***
   - Sample of the thinned region need to be submitted to the laboratory for inspection to determine what is the nature of the thinning.
3. Review wire history based on Wire Management System Dashboard:
   - Last random check on wire OD on 20th March 2022 shows reading of 0.108" for both X axis and Y axis. No thinning detected during random check detected before date of incident.
   - High jarring no. recorded during 1st month of utilisation.
   - No tension above 1000lbs recorded.
   - No smart monitor data recorded.

4. Measure wire OD from “new” sample available at base. To ensure wire initially has no thinning issues when brand new. Methods are as below:
   - Wire sample from CWR 1288 “as new” around 4 ft is straightened.



   - 9 locations along the wire sample are identified.

   - Each location is measured by using digital micrometre at 4 different axis.



   - Digital micrometer is calibrated using certified pin gauge size 0.108”.

- All measurements are recorded as per table below (unit in inch):

	Loc 1	Loc 2	Loc 3	Loc 4	Loc 5.1	Loc 5.2	Loc 6	Loc 7	Loc 8	Loc 9
Axis 1	0.10790	0.10815	0.10800	0.10795	0.10655	0.10800	0.10730	0.10800	0.10735	0.10745
Axis 2	0.10795	0.10810	0.10810	0.10800	0.10805	0.10805	0.10810	0.10810	0.10735	0.10735
Axis 3	0.10795	0.10810	0.10805	0.10795	0.10650	0.10810	0.10740	0.10800	0.10740	0.10735
Axis 4	0.10805	0.10805	0.10795	0.10795	0.10665	0.10815	0.10735	0.10805	0.10735	0.10735

Results: Initially, out of 9 locations measured, Location 5 (5.1) shows oval shape wire with 3 out of 4 axis are below minimum tolerance, at around 0.106". Laser OD results during first spooling has no reading recorded below minimum tolerance. These measurements could be a missed spot during the laser OD inspection or simply a measuring error by our inspector.
To verify on this, a few remeasuring attempts has been made on the same location 5. New measurement (5.2) shows OD values are around 0.108". We can conclude there's error in the early measurement (5.1). This shows simple mistake in the measuring method will alter the figures, and this could even happen to our experienced wire inspector with a calibrated device.

From this, we can see how important the method use and condition of the device are when taking measurement to get accurate results. In order to get more accurate reading, best to perform laser OD on the wire to get accurate measurement and limit reading error.

5. Request crew to perform pull test and wrap test on the thinning part of the wire.
   To observe pull test value, fracture pattern and surface condition of the wrapped wire. Status: In progress.
6. WOS instruct to quarantine reel CWR-1288 for further investigation.
   Wire will be replaced either with CWR-0847 (new wire) or CWR-0855 (used from JADESTONE package). Status: TBC

Conclusion.

Current data is insufficient to pinpoint the exact root cause of the wire thinning.
Pending inputs from crew offshore (pull and wrap test sample result from thinning region).
To perform laser OD inspection once wire arrived at base.
The thinning length cut from the reel need to be sent to lab for further study and investigation.