Title	Laboratory Introduction & Operations					
Target Population	Field Engineers & Field Specialists					
This requirement is applicable to:	✓	JFE		FST		EOT
		FE1		FS1		EO1
		FE2	✓	FS2		EO2
			✓	FS3		EO3

Objective:

The objective of this task is to evaluate and verity the employee's competency in identifying and performing the main type of test runs for Coil Tubing operations as well as the equipment and chemicals involved:

Tasks:

- Identify and list the main types of test typically for Coiled Tubing operation (i.e. water tests, acid tests, cement tests, gel tests, test on oil samples etc.
- Participate in the following activities at the lab (third party lab):
  - Brine mixing
  - Gel mixing (and understanding of fish eye creation)
  - Acid mixing
- Participate in the following tests whether at DB's lab or third party lab:
  - Fann 35 rheology for linear and non-linear gel (use the same gel used in sand cleanout operation).
  - pH test
  - Specific Gravity test
  - Compatibility test at third party lab (i.e. oil-brine, oil-gel)
  - Emulsion test at third party lab
  - Sludge test at third party lab
  - Acid strength test at third party lab (when possible compare the corrosion effect of acid with and without corrosion inhibitor in a piece of CT pipe)
  - Run a modified API schedule for cement to be pumped through Coiled Tubing at third party lab

Simple QA/QC only can be conducted at DB lab (i.e. pH test, Specific Gravity test, acid strength test etc.).

REQUIRED EVIDENCE:

1	**Laboratory Test Report**	/
2	**Pictures of activities performed**	/

Brief summary of employee's learning outcome (to be completed by Assessor):

Hana understand on purpose of testing with main issue to be verify from the lab test result.
Able to explain on chemical recipe use Comparing with offshore application.

OVERALL SCORE	STRONG			ADEQUATE			IMPROVEMENT NEEDED		
	10	9	8	7	6	5	4	3	2

Signature		Assessment Date	7/1/2025
Name	**MOHAMMAD FAIZAL ALI**	Position	**SENIOR OPERATION ENGINEER**

FSM / OM Comments & Recommendation:
Good understanding in term of chemical test.

Signature		Assessment Date	22/1/25
Name	**KHAIRUL RIDHWAN AZIZAN**	Position	**FIELD SERVICES MANAGER**

DIMENSION BID

PETRONAS

Laboratory Test Report
Slickline Wire for Well D05

Revision:	0
Prepared for:	PCSB-Dulang
Well:	D-05
Field:	Dulang
Date Prepared:	20 August 2024
Prepared by:	Nurul Farhanah/ Shahir Munaqib
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TABLE OF CONTENT

1. SAMPLE BACKGROUND

Dimension Bid had received 16 samples with length 1 ft each of slickline (Geowell) wire. This set of wire has been used previously while running jobs but it was still in good condition. This wire has been cut into several parts to produce 16 samples to undergo this test. All 16 samples were divided into four test which varies in time monitoring to observe the weight changes on wire. These four separate tests have been placed in four different measuring cylinders as shown in Figure 1 below and soaked in four different time monitoring which were 12 hrs, 24 hrs, 36 hrs and 48 hrs.

This lab test only required 2 types of chemicals to be mixed together with fresh water which were PDA 15% and ACM CORR 400.

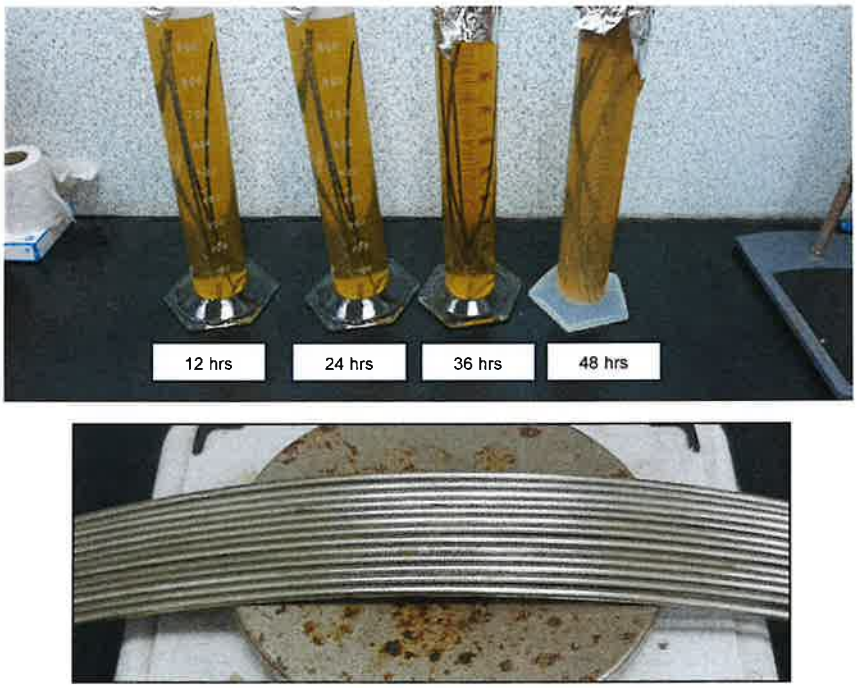


Figure 1: Sample received from Slickline

2. OBJECTIVE

1. To perform acid test on wire stainless steel slickline for strength test.

3. TEST METHODOLOGY

3.1. Equipment & Material

1. 16 samples of stainless-steel wire 1ft (Geowell)
2. 1.5 L of PDA 15% solution
3. Analytical balance (for weighing)
4. Measuring Cylinder (1 L capacity)
5. Watch Glass
6. Tongs or gloves (for handling the wire)
7. Fresh water (for rinsing)
8. PPE

3.2. Procedures

3.2.1 Preparation:

- Firstly, prepare the PDA 15% solution as per table below for each of 1L measuring cylinder.

PDA 15%			1000	ml	1.0	Liter	Description
Products	Concentration		Volume				
Fresh Water	577	LPTL	577	ml	0.577	Liter	Base fluid
Acid Corrosion Inhibitor	4	LPTL	4	ml	0.004	Liter	Acid Corrosion Inhibitor
33% HCl	419	LPTL	419	ml	0.419	Liter	Raw Acid

- Mix the solution using 2L beaker and agitate it at 1000 rpm for 4 minute to ensure the solution is homogeneous. Ensure to wear appropriate PPE while handling the chemicals such gloves, goggles, lab coat and covered shoes.

3.2.2 Weighing the Wire:

- After that, weight the initial and record in a proper table as shown in the results section below.

3.2.3 Soaking the Wire:

- Next, placed 4 samples of stainless-steel wire in each of measuring cylinder and pour PDA 15% solution, ensure that the wire is fully covered by the solution.
- Start a timer and allow the wire to soak in the PDA 15% solution for 12 hours, 24 hours, 36 hours and 48 hours.

3.2.4 After Soaking the Wire:

- Stop Soaking: After 12 hours, carefully remove the wire from the acid using tongs or gloves.
- Rinse: Rinse the wire thoroughly with distilled water to remove any remaining acid.
- Drying (Optional): If precise measurement is required, dry the wire in a drying oven or desiccator to remove any residual moisture.

3.2.5 Final Weighing the Wire:

- Record: Record the final weight of the wire using the analytical balance.

3.2.6 Analysis:

- Weight Loss Calculation: Calculate the difference between the initial and final weights of the wire to determine the amount of material loss due to the acid exposure

3.2.7 Clean Up:

- Disposal: Dispose of the used HCl solution and any waste materials according to your lab's safety protocols.
- Clean: Clean all equipment and your work area thoroughly.

Notes:

1. Ensure that the entire procedure is conducted in a well-ventilated area, preferably under a fume hood, due to the corrosive nature of HCl.
2. All measurements should be taken accurately to ensure reliable results.

This procedure allows you to measure the effect of 15% HCl on the stainless-steel wire by comparing the weight before and after the 12-hour exposure period.

4. RESULT AND OBSERVATION

Time	Initial Reading (gram)	Final Reading (gram)	Reduction (gram)
12 hrs	39.7	39.5	0.2
	39.4	39.1	0.3
	39.8	39.6	0.2
	39.3	39.0	0.3
24 hrs	19.2	18.9	0.3
	19.7	19.4	0.3
	19.9	19.6	0.3
	19.2	18.9	0.3
36 hrs	19.4	19.1	0.3
	19.2	18.9	0.3
	19.5	19.2	0.3
	18.8	18.5	0.3
48 hrs	19,4	19.0	0.4
	18.8	18.5	0.3
	19.0	18.6	0.4
	18.8	18.5	0.3

5. DISCUSSION

1) From the lab test that has been done, we can observe the reduction of weight from the wire is between 0.2 to 0.4 gram.
2) The colour of the solution PDA 15% changed after soaking with the wire from yellow to greenish to indicate the corrosion of the wire happened during soaking activity.

6. CONCLUSION

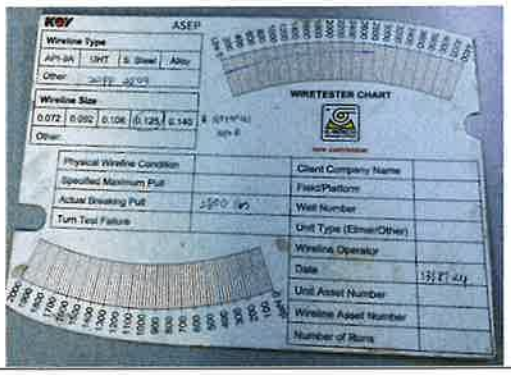
- The longer the soaking time, the more the weight will reduce.

7. APPENDIX

Type of wire: ZAPP 2507 (Super Duplex Stainless Steel)

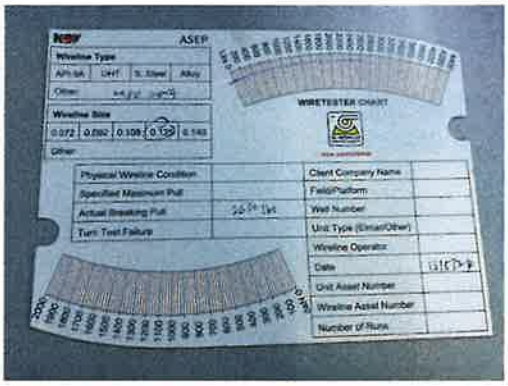
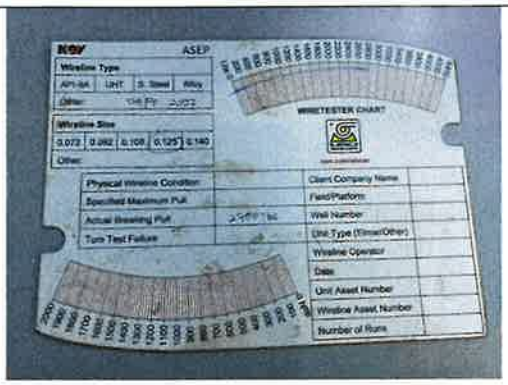
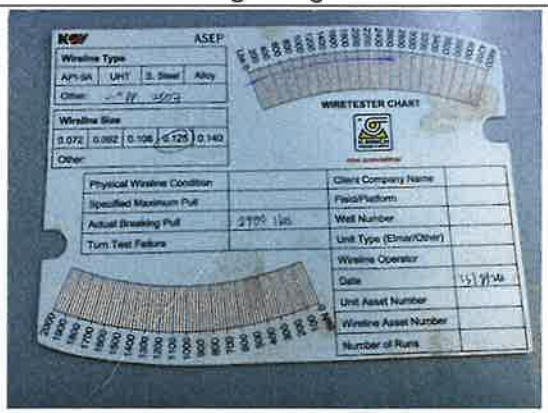
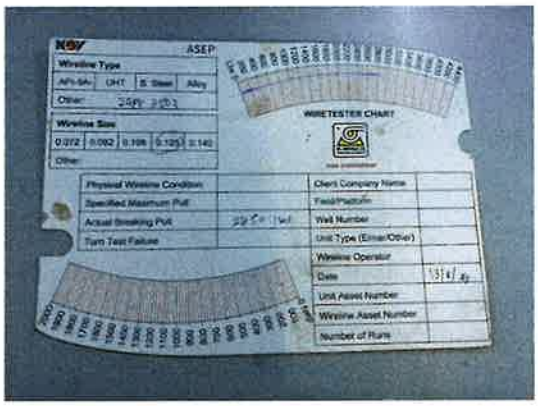
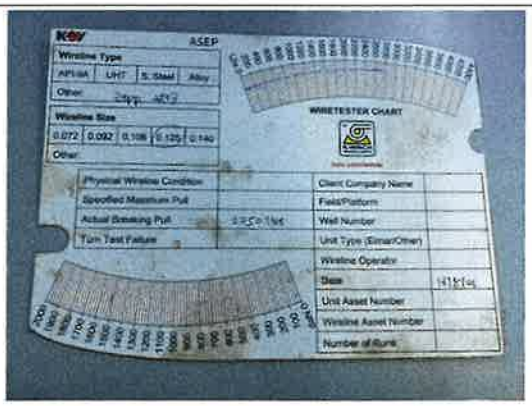
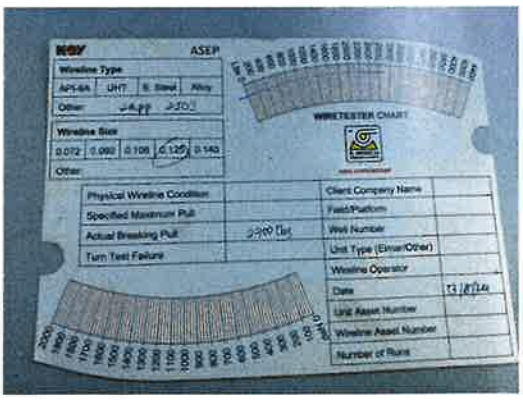
Wire size: 0.125"

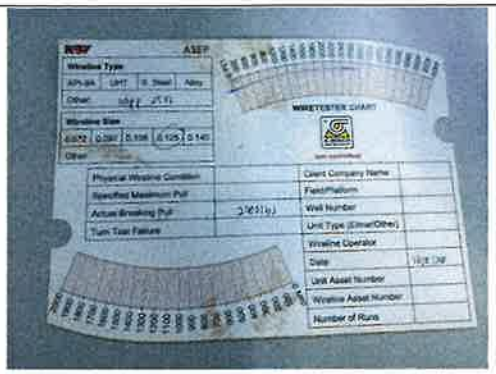
Wire Testing Result

Without Soak with Acid		
Wire Breaking Strength:		2800lbs

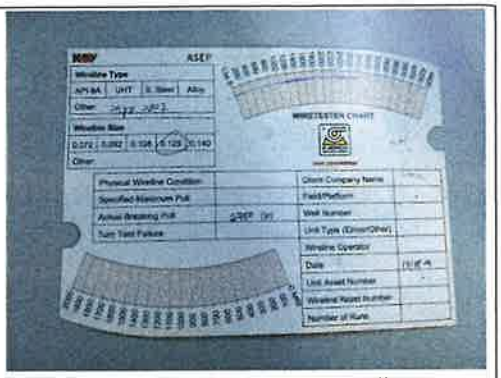
#Soaked for 12 Hours

Wire Testing Result

After Soaking with 15% HCL Acid	
 Wire Breaking Strength: 2650lbs	 Wire Breaking Strength: 2700lbs
 Wire Breaking Strength: 2700lbs	 Wire Breaking Strength: 2850lbs
 Wire Breaking Strength: 2750lbs	 Wire Breaking Strength: 2700lbs

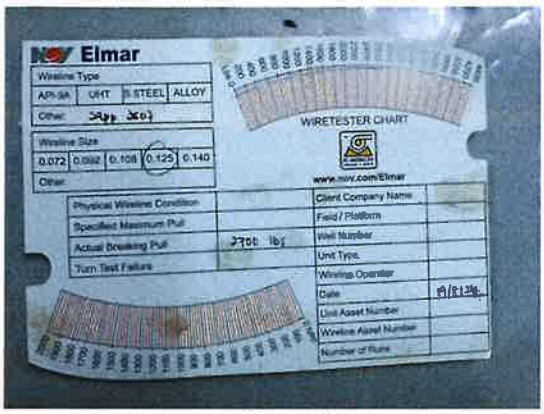
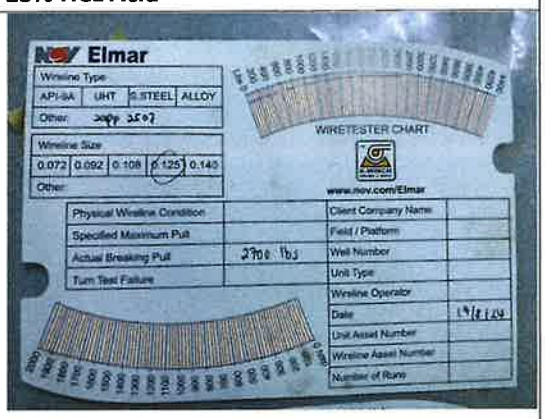


Wire Breaking Strength: 2700lbs

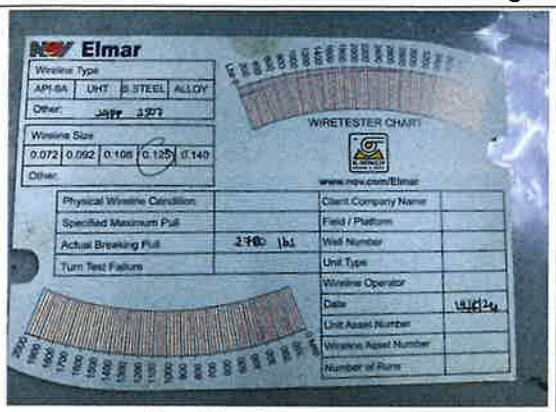
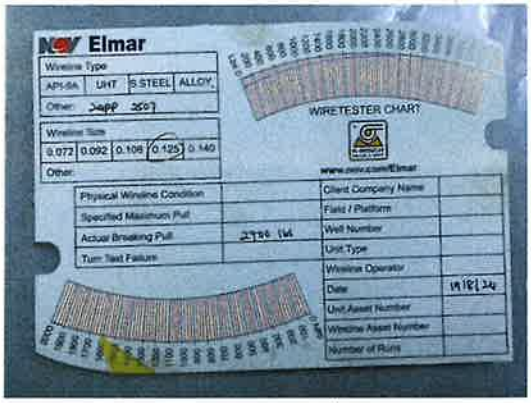


Wire Breaking Strength: 2750lbs

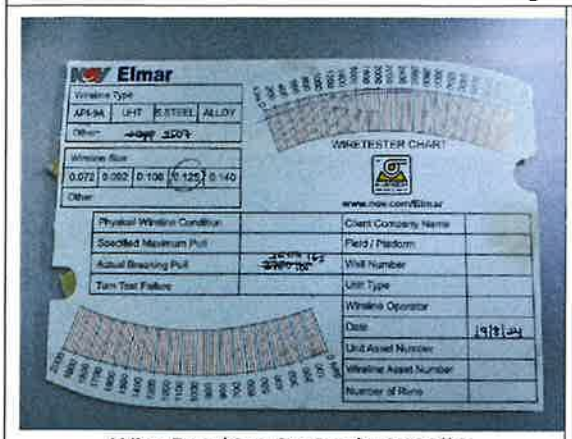
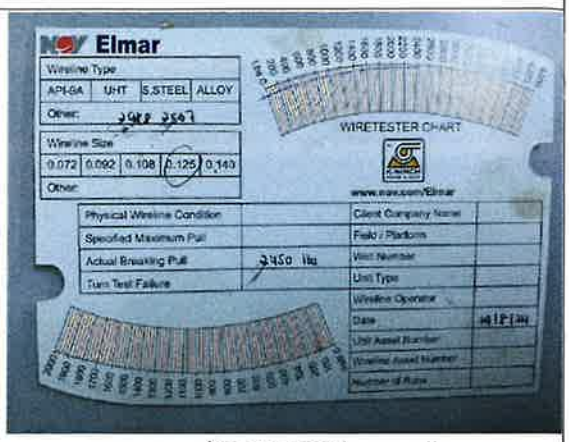
#Soaked for 24 Hours

After Soaking with 15% HCL Acid	
	
Wire Breaking Strength: 2700lbs	Wire Breaking Strength: 2700lbs

#Soaked for 36 Hours

After Soaking with 15% HCL Acid	
	
Wire Breaking Strength: 2700lbs	Wire Breaking Strength: 2700lbs

#Soaked for 48 Hours

After Soaking with 15% HCL Acid	
	
Wire Breaking Strength: 2600lbs	Wire Breaking Strength: 2450lbs