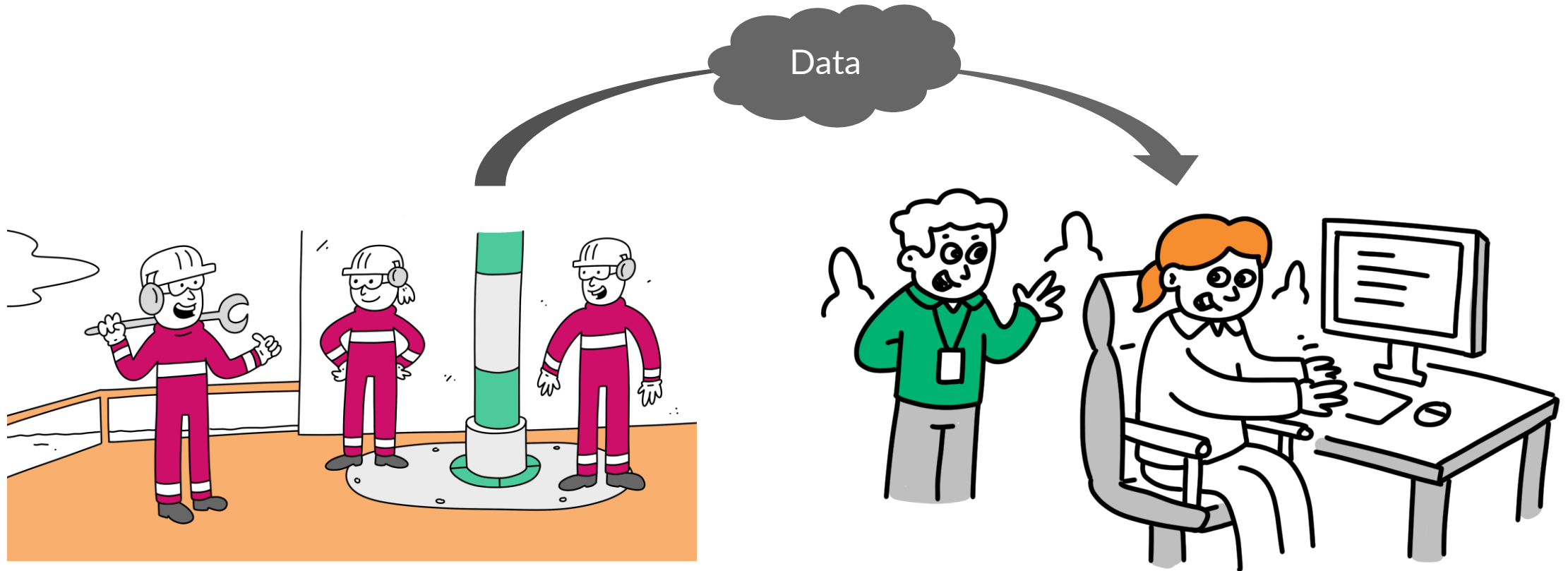


IntelliCalli

Integrity and caliper data always updated and available for data analysis

ICoTA November 20th - Tomas Bolme - AkerBP

Data Management Interventions and Integrity



DIGE's contribution to Aker BP's strategy

Aker BP's strategic objectives and ambitions

DIGE's *main* contribution towards Aker BP's long-term strategic priorities is to lead the transformation of E&P through digitalization. DIGE's strategic vision is hence to "*become the world's first data-driven E&P company*". Every day, we take new leaps towards realizing this vision by providing high-value deliveries to Aker BP, and by setting stretch objectives and continuously learn and improve.

High-value deliveries:

Deliveries that reduce costs and improves efficiency for Aker BP's end-to-end processes.

Objectives and improvements:

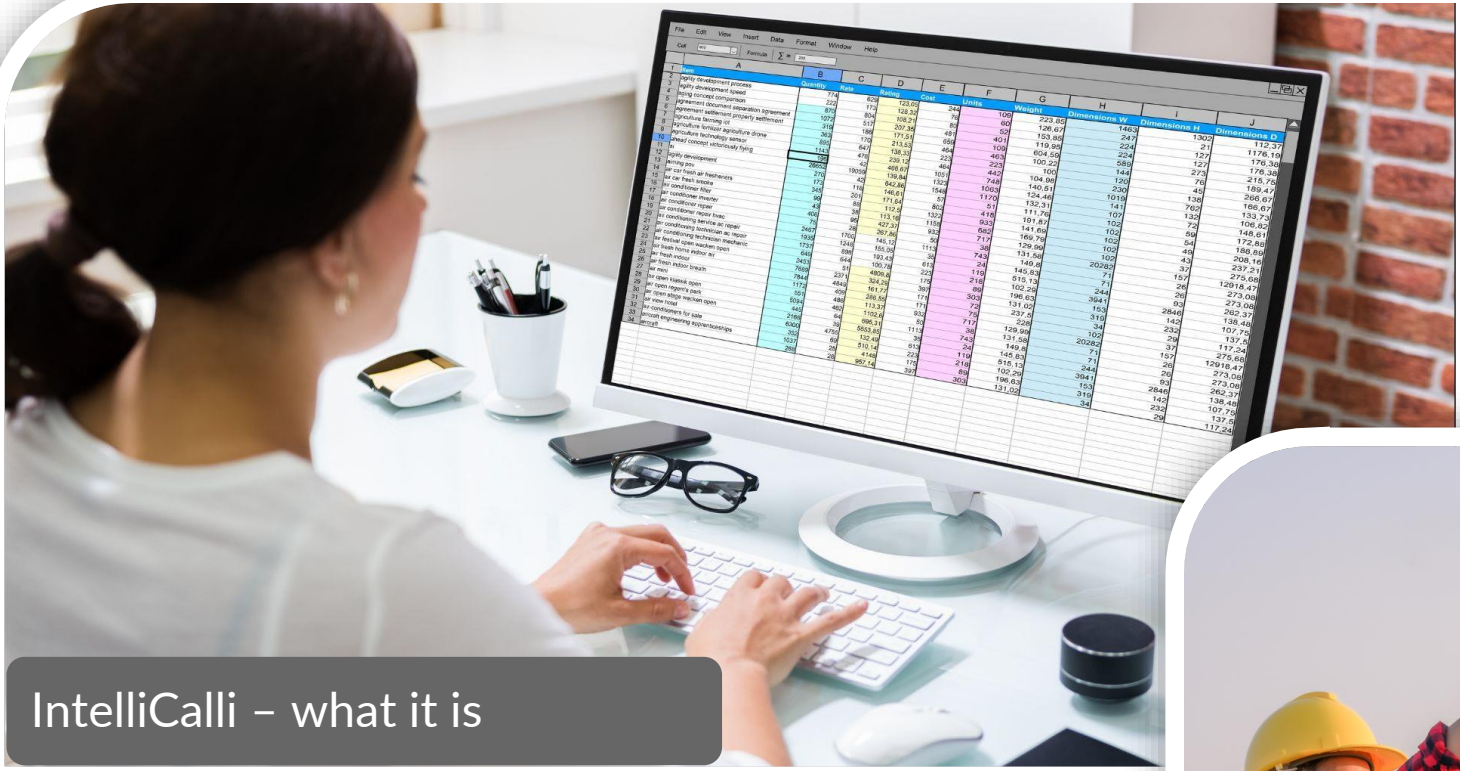
Ambitious short-term objectives and continuous improvement of day-to-day operations

DIGE's vision of data-driven:

Data-driven decision-making and prioritization across BUs in Aker BP

Aker BP's strategic objectives:

DIGE is contributing to lead the transformation of E&P



IntelliCalli – what it is



User experiences

Well interventions and calliper logging

Aker BP

- Valhall (1982)
- Ula (1986)
- Skarv (2012)
- Edvard Grieg (2015)
- Ivar Aasen (2016)

Valhall

- Production since 1982
- 49 producing wells



The Well Integrity Team

WIMS

Status Assessment ▾ Operational History ▾ Well Details ▾ Monitoring ▾ WH and Valve ▾ Completion Status ▾

Integrity
Consequence
Actions
Exemptions

Integrity Summary History Integrity Matrix Process Details WBS Actions

Integrity Summary

Confirmed integrity

■ Healthy well
Days with status: 24 days

Status codes:

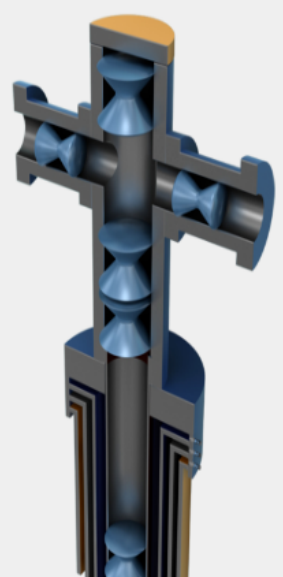
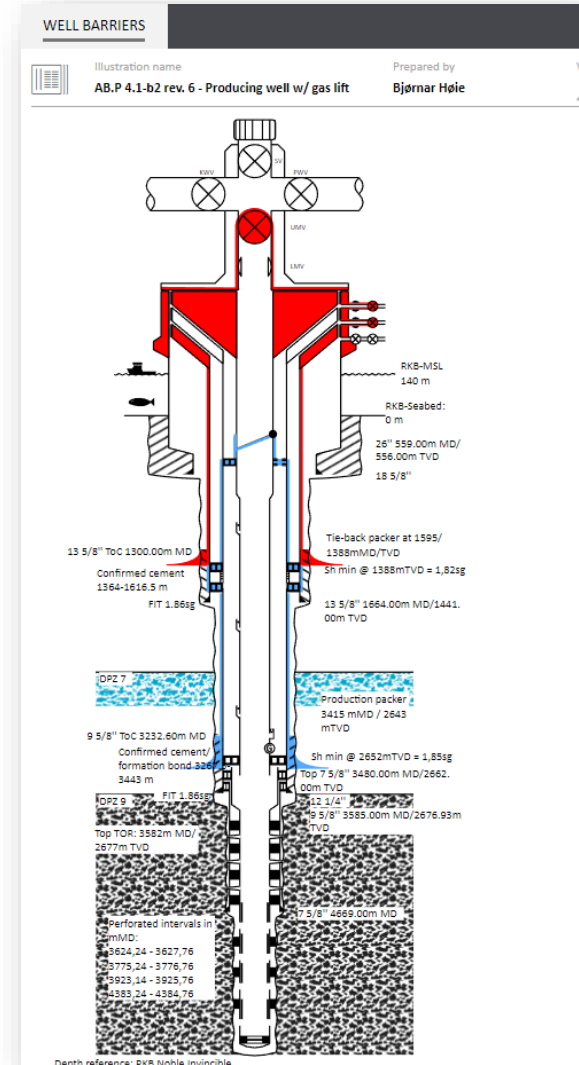
- One barrier failed, other barrier degraded
- One barrier failed
- One barrier degraded
- Healthy well
- Not defined

Action rank

Failure description: No failures registered on this well

Indicators

● Annulus	● Tubular	● Pressure vs MAASP
● Valve	 WT Loss	● Operating Envelope

- Manual work
- Incomplete data
- No data standard
- Hard to analyse
- Outdated data

Logtek Valhall, 2/8-G-17 T4 MFC40 Survey

Objective
Assess tubing condition.

Quality & Editing of this survey
Pre survey finger calibrations were done with 3.125-9.625" calibration ring Schlumberger field print for tool calibration.
The log was acquired in one single logging pass at 10m/min in most of intervals. The 40arm GoWell caliper used returned generally good data. Finger #27 is a minor finger drift is observed; hence a median recalibration has been applied. 5.5" intervals has been recalibrated based values from tubing hanger-34.4m interval has been recalibrated based on data from SPM - 2774.3m (circular shifts on page 33).
A few telemetry spikes have been interpolated in interval 1883.6-1884m. Depth has been correlated to attached CSD, last updated 04.02.2022.

Conclusion
5.5" 20th Tubing (35 - 552m):
Severe tubing wear is observed in intervals 148 - 331m and 374 - 551m. Mean ID in interval 115-160m is very close to nominal ID and inner surface indicates tubing in good condition. Slightly larger mean ID in interval 115-160m indicates minor general corrosion.
No scale/deposit indicated in this interval.

Schlumberger Valhall, 2/8-N-3 A-Y1T2 Pipe Integrity from PMIT

Mechanical Caliper Data (MIT40) - Pipe Statistics

Run #	Top Joint Depth [m]	Bottom Joint Depth [m]	Interval Length [m]	Maximum Measured Internal Diameter [mm]	Minimum Measured Internal Diameter [mm]	Average Measured Internal Diameter [mm]	Maximum Measured External Diameter [mm]	Minimum Measured External Diameter [mm]	Average Measured External Diameter [mm]	Comments
8934	1807.82	12.83	35.96	2.082	5.83	1802.42	3.897	3.973	4.261	
8934	1808.69	12.83	34.86	2.094	5.86	1803.82	3.906	3.996	4.260	
8934	1811.49	12.83	32.67	2.087	5.83	1804.61	3.910	3.961	4.261	
8934	1816.28	12.83	29.67	2.088	6.07	1810.68	3.889	3.936	4.263	
8934	1819.12	12.83	26.65	2.076	5.51	1804.05	3.923	3.976	4.266	
8934	1823.92	12.83	22.96	2.063	5.33	1800.52	3.923	3.966	4.268	
8934	1828.73	12.83	24.68	2.066	4.83	1808.41	3.920	3.973	4.267	
8934	1833.56	12.83	22.22	2.063	5.44	1806.73	3.919	3.973	4.264	
8934	1838.37	12.83	21.25	2.058	5.52	1812.99	3.895	3.975	4.275	
8934	1843.21	12.83	21.30	2.063	5.11	1805.79	3.899	3.980	4.273	
8934	1848.06	12.87	22.38	2.063	5.37	1809.36	3.863	3.972	4.268	
8934	1848.65	12.87	22.46	2.063	5.97	1820.33	3.862	3.978	4.266	
8934	1851.68	12.87	21.75	2.043	5.15	1802.37	3.898	3.976	4.263	
8934	1854.93	12.87	18.88	2.061	5.16	1809.60	3.875	3.970	4.263	
8934	1857.31	12.87	16.28	2.056	6.35	1837.04	3.851	3.974	4.268	
8934	2000.15	12.83	28.38	2.066	5.71	2002.48	3.907	3.975	4.262	
8934	2011.99	12.87	28.44	2.064	5.25	2013.72	3.967	4.069	Telemetry Spike Observed	
18727	2.028	4.46	2002.49	3.877	3.968	4.261				
18727	2.022	5.46	2004.81	3.893	3.973	4.261				
18727	2.029	4.83	2004.32	3.892	3.962	4.264				
18727	2.028	5.12	2002.49	3.876	3.972	4.262				
18727	2.049	6.89	2000.36	3.895	3.968	4.262				
18727	2.027	4.87	2000.61	3.876	3.967	4.262				
18727	2.027	4.59	2108.29	3.860	3.963	4.265				
18727	2.021	4.58	2118.12	3.860	3.970	4.267				
18727	2.027	4.10	2151.78	3.846	3.965	4.267				
18727	2.027	5.10	2147.42	3.892	3.971	4.260				
18727	2.022	4.31	2193.50	3.850	3.964	4.269				
18727	2.027	5.27	2198.88	3.860	3.961	4.265				

D&I – Analysis and Interpretation Services
SCA

Archer

22-June-23

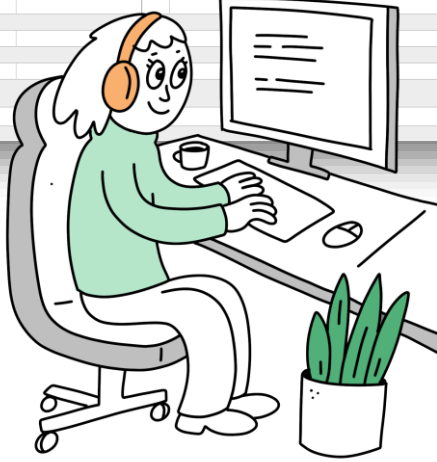
VIVID, Multifinger Caliper and Radial Bond Tool Combined Report

Client: Aker BP
Field: HOD
Well: 2/11-A-8A
Reference no: 2023-06-104
Survey date: 17th - 18th June 2023
Analyst: A. Duff
Reviewed by: A. Primarolo

Pipe Integrity from Tool (PMIT-B, 40)

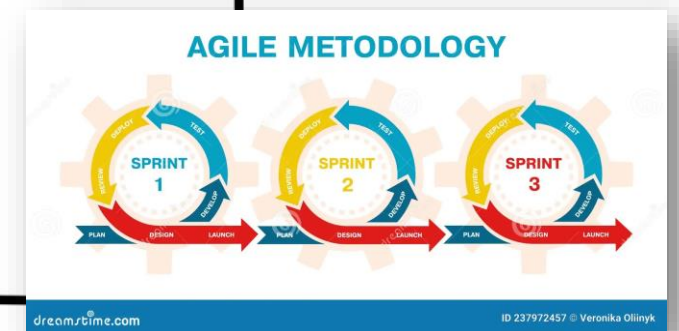
Company: Schlumberger
Field: Valhall
Well: 2/8-N-3 A-Y1T2
Country: Norway
Log Analyst: Nitesh Kumar
Date: 04 April 2021
Product Code: PIL-PMIT

Schlumberger



WELL-MASTER WMD Data

Work method



Legacy data/new data

- Standardized data
- Legacy data 2001 - 2023

Schlumberger

Valhall,
2/8-N-3 A-Y1T2

Pipe Integrity from
PMIT

Mechanical Caliper Data (MIT40) - Pipe Statistics											
Tubing OD Number (in)	Joint Depth (in)	Top Joint Joint Length (in)	Maximum Penetration (%)	Maximum Internal Radius (in)	Maximum Metal Loss (%)	Maximum Recorded Internal Radius Depth (in)	Minimum Internal Diameter (in)	Average Internal Diameter (in)	Maximum Internal Diameter (in)	Comments	Maximum
											Recorded Internal Diameter (in)
#153	1807.82	12.83	30.94	2.063	5.83	1813.42	3.897	3.973	4.061		
#154	1830.65	12.83	34.99	2.074	5.66	1827.82	3.906	3.974	4.060		
#155	1833.49	12.80	32.37	2.067	5.83	1845.61	3.914	3.981	4.061		
#156	1846.28	12.84	29.07	2.058	6.67	1851.08	3.899	3.976	4.051		
#157	1859.12	12.80	33.65	2.070	5.51	1864.01	3.921	3.978	4.066		
#158	1871.92	12.81	27.36	2.053	5.53	1883.12	3.911	3.981	4.056		
#159	1884.73	12.83	24.68	2.046	4.81	1889.43	3.910	3.973	4.047		
#160	1897.56	12.80	27.22	2.053	5.44	1900.70	3.879	3.973	4.064		
#161	1910.37	12.84	29.01	2.058	5.92	1911.99	3.895	3.975	4.075		
#162	1923.21	12.77	31.09	2.063	6.11	1927.79	3.890	3.980	4.072		
#163	1935.98	12.87	27.38	2.053	5.37	1939.36	3.867	3.972	4.058		
#164	1948.85	12.83	27.41	2.053	5.17	1957.53	3.902	3.978	4.064		
#165	1961.68	12.87	23.75	2.043	5.61	1962.37	3.896	3.976	4.055		
#166	1974.55	12.79	18.80	2.050	5.33	1975.69	3.871	3.972	4.063		
#167	1987.33	12.82	31.28	2.064	6.36	1987.94	3.881	3.974	4.069		
#168	2000.15	12.83	24.58	2.046	5.21	2002.48	3.907	3.976	4.052		
					5.59	2012.32		3.967	4.069	Telemetry Spike Observed	
					4.49	2022.48		3.877	3.968		
					5.44	2041.81		3.892	3.973		
					4.83	2054.52		3.965	4.034	Telemetry Spike Observed	
					5.12	2067.49		3.876	3.972		
					6.09	2080.38		3.855	3.968		
					4.07	2096.01		3.876	3.967		
					4.59	2108.29		3.860	3.963		
					4.78	2118.12		3.854	3.970		
					4.10	2131.78		3.846	3.965		
					5.52	2147.62		3.818	3.971		
					4.51	2159.50		3.855	3.964		
					5.07	2168.89		3.864	3.965		
					3.88	2187.49		3.963	4.031	Telemetry Spike Observed	
					8.64	2201.27		3.843	3.989		
					3.76	2210.93		3.851	3.963		
					4.37	2218.62		3.852	3.967		
					3.28	2228.50		3.854	3.959		
					3.92	2244.01		3.858	3.965		
					4.18	2255.32		3.865	3.965		
					4.99	2269.86		3.883	3.970		
					6.17	2291.06		3.888	3.976		
					4.72	2301.48		3.870	3.966		
					4.59	2306.99		3.840	3.958		
					3.47	2322.58		3.850	3.963		
					4.32	2338.48		3.876	3.968		
					4.82	2351.56		3.770	3.966		
					4.86	2358.02		3.836	3.967		
					5.10	2373.52		3.851	3.972		
					6.47	2389.44		3.868	3.971		
					5.44	2402.45		3.866	3.971		
					5.42	2407.23		3.967	4.071	Telemetry Spike Observed	
					5.71	2428.36		3.876	3.971		
					4.86	2431.46		3.873	3.972		
					5.76	2451.09		3.845	3.969		
					6.55	2458.90		3.890	3.980		
								3.735		Middle SPM	
#204	2456.99	4.19	22.66	2.080							
#205	2461.17	3.06									
#206	2464.24	4.18	14.67	2.019	1.61	2466.99	3.901	3.958	4.009		
#207	2468.42	12.84	13.72	2.016	2.53	2468.48	3.867	3.956	4.051		
#208	2481.25	12.82	13.92	2.027	2.69	2483.08	3.911	3.957	4.024		
#209	2494.07	12.83	9.54	2.005	1.56	2506.43	3.906	3.956	3.996		
#210	2506.90	12.80	11.64	2.011	1.52	2512.04	3.913	3.957	4.001		
#211	2519.70	12.80	13.96	2.017	1.87	2522.50	3.902	3.954	4.011		
#212	2532.50	12.80	11.87	2.013	2.11	2540.62	3.905	3.956	4.000		
#213	2545.30	12.82	13.09	2.014	2.84	2554.35	3.892	3.954	4.012		
#214	2558.12	12.80	13.64	2.016	1.84	2564.10	3.909	3.958	4.003		
#215	2570.92	12.81	11.09	2.009	2.22	2574.53	3.900	3.954	4.008		
#216	2583.73	12.82	14.21	2.018	2.62	2598.11	3.891	3.957	4.005		
#217	2596.55	12.83	15.10	2.020	1.88	2603.59	3.902	3.958	4.006		
#218	2609.38	12.80	11.09	2.009	1.31	2612.98	3.913	3.957	4.001		
#219	2622.18	12.79	11.81	2.011	2.12	2630.66	3.901	3.957	4.006		
#220	2634.96	12.83	10.81	2.008	1.46	2638.14	3.904	3.954	4.006		
#221	2647.79	12.79	13.67	2.016	0.69	2658.15	3.881	3.948	3.994		
#222	2660.58	12.45	8.66	2.002	0.00	2671.76	3.872	3.939	3.987		
#223	2673.03	12.80	11.73	2.011	2.18	2679.13	3.873	3.955	3.998		
#224	2685.83	12.80	14.51	2.018	1.78	2688.79	3.880	3.960	4.014		
#225	2698.65	12.82	9.68	2.005	2.39	2711.05	3.921	3.960	4.003		
#226	2711.47	12.79	12.99	2.014	2.07	2719.01	3.905	3.959	4.009		
#227	2724.26	12.81	12.86	2.014	3.76	2735.84	3.905	3.958	4.009		
#228	2737.07	4.04	12.68	2.013	3.65	2739.79	3.914	3.966	4.010		

Table 1 – Pipe Statistics

Valhall, 2/8-G-17 T4 MFC40 Survey

AkerBP

condition.

Editing of this survey

nger calibrations were done with 3.125-9.625" calibration rings. Refer to field print for tool calibration.
acquired in one single logging pass at 10m/min in most of interval.
oWell caliper used returned generally good data. Finger #27 is out of calibration and drift is observed; hence a median recalibration has been applied to the data. Data from has been recalibrated based values from tubing hanger ~34.4m and data from 4.5" been recalibrated based on data from SPM ~ 2774.3m (circular area). See recalibration

AkerSolutions

Multi-Finger Caliper Analysis Report

Client: BP
Well No: 2/8-N-13
Field: Valhall
Date: 14.10.2012

Aker Solutions

Lagerveien 30, P.O Box 281
NO-4066 Stavanger, Norway
Telephone +47 51 95 16 00

www.akersolutions.com/wellservice

D&I – Analysis and Interpretation Services

Archer

22-June-23

VIVID, Multifinger Caliper and Radial Bond Tool Combined Report

Client: Aker BP
Field: HOD
Well: 2/11-A-8A
Reference no: 2023-06-104
Survey date: 17th – 18th June 2023
Analyst: A. Duff
Reviewed by: A. Primarolo

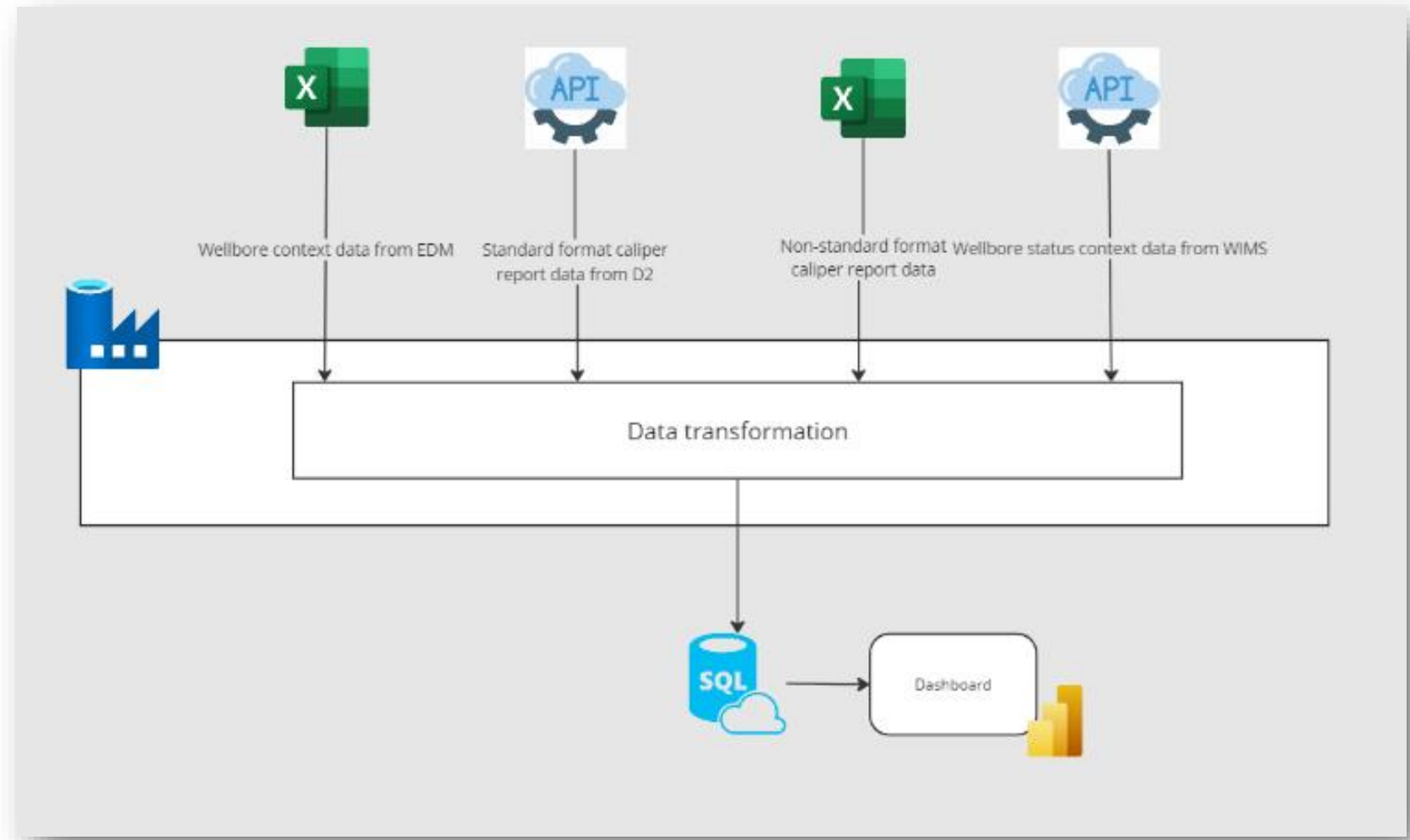
Pipe Integrity from PSP compatible Tool (PMIT-B, 40 fingers)

Company: AkerBP
Field: Valhall
Well: 2/8-N-3 A-Y1T2
Country: Norway
Log Analyst: Nitesh Kumar
Date: 04 April 2021
Product Code: PIL-PMIT

Schlumberger

The solution

- Aker BP data standards
- Clean up - D2
- API connections
- ETL processes
- IntelliCalli front-end



D&W: Whole Lotta Love

- WLL Landing Page
- Management
- Engineering and operations
- Initiative tracking
- Third-Party Reports
- Other
- Azure functions log metrics

Welcome to Drilling & Wells: Whole Lotta Love!

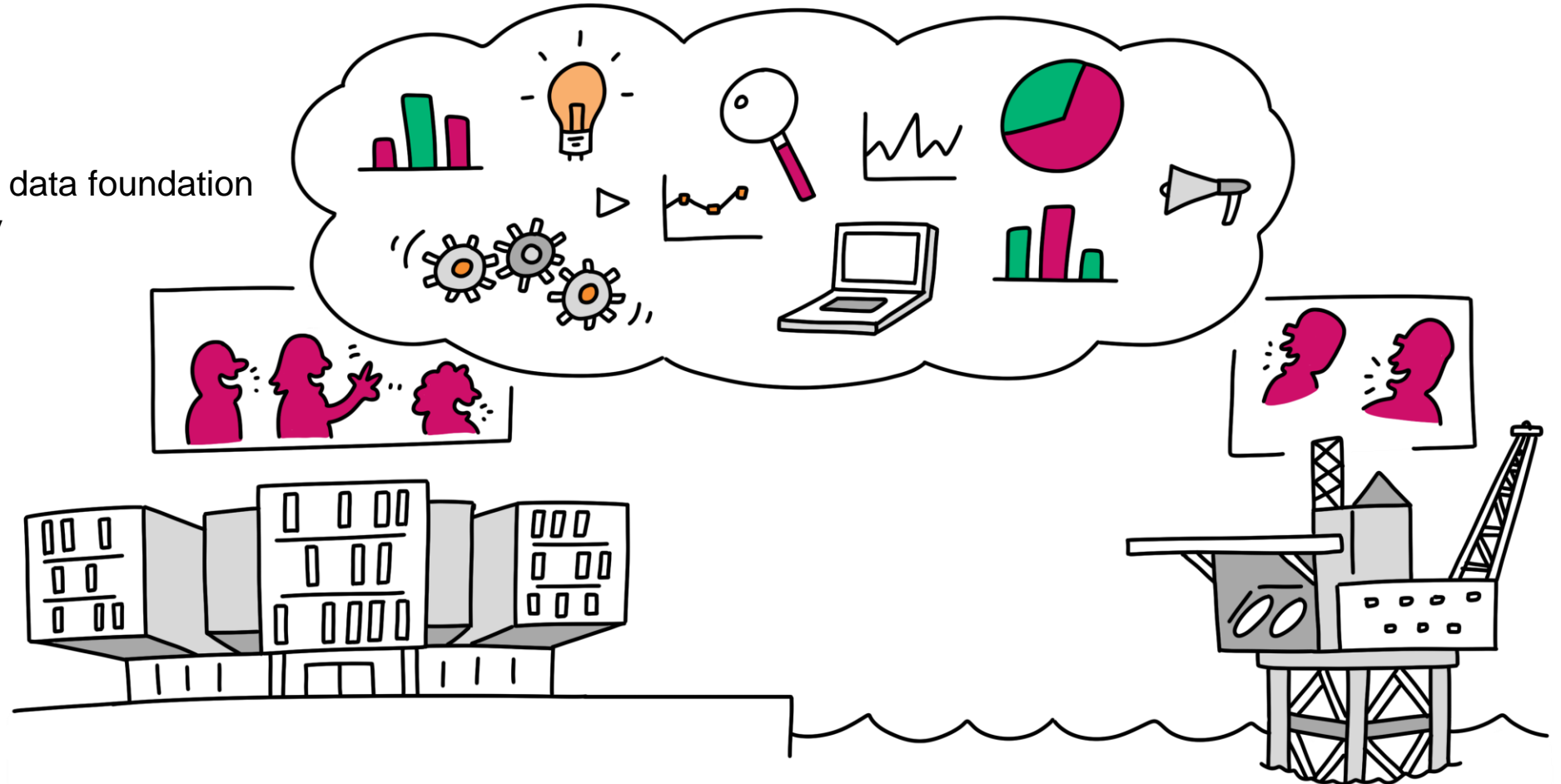
Feedback

Management	Engineering and operations		Initiative tracking	Third-party reports
Performance first KPI dashboard	Daily operations reports	Daily partner operations reports	BMS work programme	Aker BP landing page
Intervention toolkit	Data quality reports	NPD daily report submission status	Digital OBS cards	D&W Inventory Management
Are we there yet? Benchmarking	D&W cost estimation	OpenWells NPT analytics	Improvement proposals	IntelliCalli Caliper Report
D&W emissions	MLC benchmarking	OpenWells historical data	OCC roadmap	Intervention production hopper
Well scorecards	OpenWells operations data	Intervention performance	Rig schedule change tracker	Well Intervention Cost Report
Supply chain management	CSD data extractor		Well complexity index	Cost Insight
			Well milestone tracker	

Go back

Current situation

- ✓ Complete legacy data
- ✓ Data standard
- ✓ Automatically updated
- ✓ More data driven
- ✓ Improved analytics and data foundation
- ✓ Highlighted data quality





User experiences

Daily usage

- ✓ Multiple users every day
- ✓ Different user groups
- ✓ Plan for maintenance



Thomas Vold - Well Integrity Engineer

Usage: Monthly

What do you use it for?

It's very simple to access the data and the reports itself with the link to the master source (D2).

I quickly get an overview of the current integrity status on a specific wellbore.

In general, documentation isn't easily accessible, but with IntelliCalli it's a lot more easy.

Why is it useful in your job?

More effective as I get the right data easier. Data availability.

What do you like the most with it?

Simpler overview of all surveys.

I haven't explored the analytic features yet, but they seems interesting.



Øyvind Erviksæter - Well Intervention Supervisor

Usage: Weekly when in operation offshore

What do you use it for?

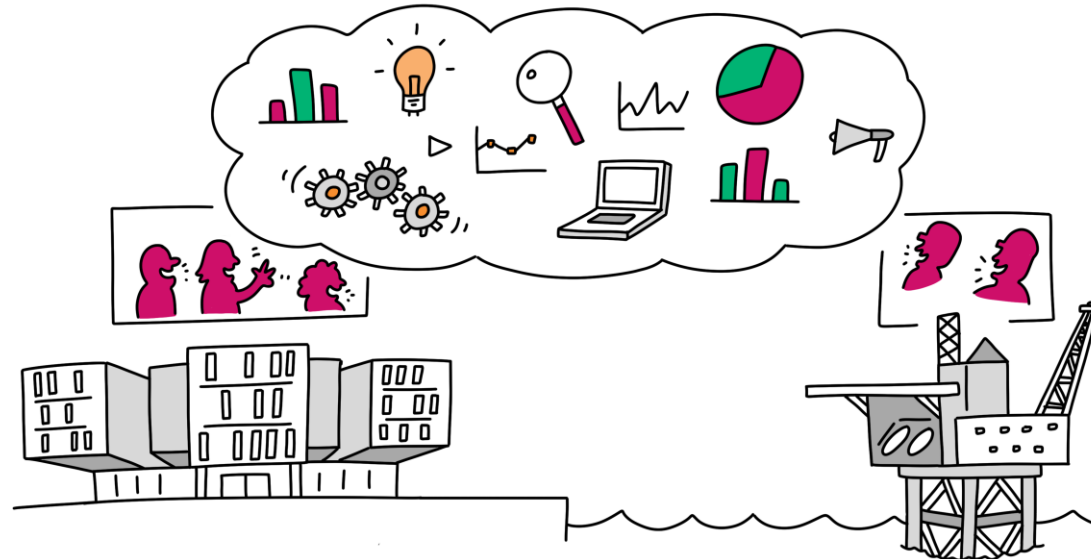
Easily accessing logging data. Before I had to go to the vendors solutions to download the data if I needed them.

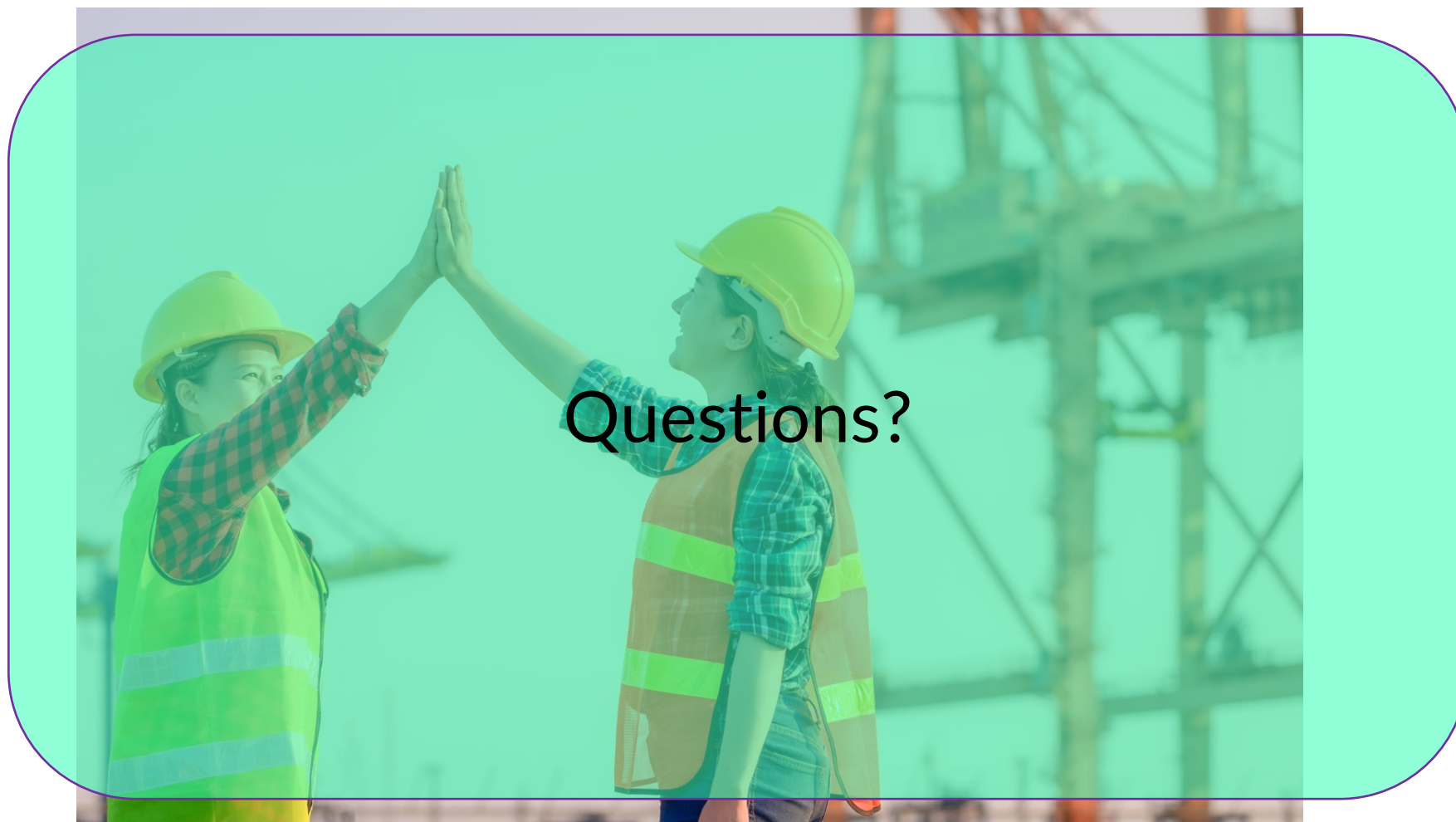
Why is it useful in your job?

When in operation and I want to check myself the calliper data for the well, I can with IntelliCalli always find what I need without support from any others. Smoother operations

What do you like the most with it?

The availability of data





Questions?



www.akerbp.com