IATMI22-050

Application of e-ORDC as Digital Transformation to Improve Safety, Job Planning and Execution in Sumatera Light Oil Operation of Rokan Block

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Abstract. ORDC (Operator Routine Duty Checklist) is one of critical activity which support production optimization and securing the HES concern as safeguard process. Nowadays, the importance of ORDC data utilization is increasing, as it supports digital transformation as part of production optimization and HES compliance. e-ORDC is a new platform by using Survey123 online system. Old process, Well Checker will be collecting well data with print paper and takes a long time for data verification and difficulty in monitoring and tracking historical wells information. The new process has been improved the quality of corrective actions, effectively, reliably, paperless and prevent delay of wrong data submission. Effective to deliver 3 types of report (oil producer, injector and gas well) to x-functional teams and O&M's stakeholder and improve the quality information regarding surface wellhead condition and operation activities within 24 hours.

This paper will explain how digital transformation in the new era of oil companies is strongly influenced by the process to execution and control. As an effort to increase digitization, e-ORDC comes with an automatic idea that will greatly facilitate users/stakeholders to access data, either collecting historical data or reviewing actual conditions from wells. This paper qualitatively classifies the project on digital business transformation into three different clusters based on technological, business, and time efficiency.

Keyword(s): Digital Transformation, Time Effectiveness, Paperless, Efficient.

1 Introduction

Digital transformation has become a significant part of evolution, production and HES compliance. ORDC is the process of checking wells on a daily routine basis for all active wells by looking at actual well condition**.** Old process, Well Checker will be collecting well data with print paper and takes a long time for data verification and difficulty in monitoring and tracking historical wells information. The new process would be improving the quality of corrective actions, effectively, reliably, paperless and prevent delay of wrong data submission.

2 Digital Transformation in New Era Oil Company Business

Digital transformation is the large-scale business transformation, which affects the entire set of enterprise functions from the automation of processes to execution and control [3]. Importance of ORDC data utilization is increasing, as it supports digital transformation as part of production and HES compliance. Digital transformation initiatives are enabling the opportunity for the energy industry to make a step change in one of the major contributing factors to Major Accident Hazard (MAH) and also other operational loses such as production downtime and product quality[1]. Utilizing digital systems to store

and maintain details contained in a number of these reports, enable critical procedures/barriers to be automatically fed into input into the human factors roadmap, removing the need to do this manually and maintain multiple systems of record. The need for digitalization as an effort to increase business value is very widespread by industrial companies today. In fact, the value potential enabled by digitalization technologies is so significant that some regard the current period in the evolution of industry as industry's fourth industrial revolution. If industrial companies approach this new era from the perspective of unleashing incremental value from industrial operations and businesses, the result can be revolutionary [2].

2.1 Reducing Paper-Based System

e-ORDC is a new platform by using Survey123 online system. Old checking well process, well checker will be collecting well data with print paper and takes a long time for data verification and difficulty in monitoring and tracking historical wells information. The new process has been improved the quality of corrective actions, effectively, reliably, paperless and prevent delay of wrong data submission. The use of such devices allows new error reducing techniques to be leveraged, which are not achievable in a paper-based system[1]. Although the opportunity to not follow a procedure still exists when using a mobile device, a digital record will be produced when each step has been executed, the total time taken to execute the procedure and potentially the location where each step was performed. This data can then be analyzed, providing the assurance that a procedure is being followed or identifying where it isn't and when refresher training/re- enforcement of the safe way to execute the task is required.

2.2 Time Effectiveness for Man Hour Saving

Based on review in 2019, e-ORDC is effective for reducing taken time for ORDC duration which leads to man hour saving.

Monthly	Before Improvement (baseline)	After Improvement	Delta Improvement	# of ORDC taken in active wells	Total Man Hours Improvement	Man Hour Rate	Man Hour Saving	Cummulative Man Hour Saving
	ORDC Duration (hours)	ORDC Duration (hours)	ORDC Duration Improvement (hours)		(hours)	($/hr)	($)	($)
	a	b	c=a-b	d	e=(c*d)	f	g=(e*f)	h
Jan-19	0.897	0.25	0.647	533	344.882	13.88	4,786.72	4,786.72
Feb-19	0.897	0.25	0.647	523	338.412	13.88	4,696.91	9,483.63
Mar-19	0.897	0.25	0.647	621	401.824	13.88	5,577.02	15,060.64
Apr-19	0.897	0.25	0.647	547	353.941	13.88	4,912.45	19,973.09
May-19	0.897	0.25	0.647	588	380.471	13.88	5,280.65	25,253.74

Figure 1. AFB Calculation (Man Hour Saving After Using e-ORDC Improvement)

Improvement and evaluation with time effectiveness, summary reporting process, and response time performance.

3 The Concept of E-ORDC (Electronic- Operator Routine Duty Checklist)

ORDC is the process of checking wells on a daily routine basis for all active wells by looking at condition related with data for PE Review (Pressure, temperature, Load Amp), wellhead compliance requirement (Wellhead and Accessories, Leaking information), LEL Measurement and facility (distance to surrounding community, access road and well pad condition). Previous ORDC still have many gaps in data utilization in terms of timing, data quality, data prioritization and system of record. Various content and format, uploading process, system of record and workforce management are challenges to obtain qualified ORDC data in timely manner.

The new ORDC is utilizing Survey123 application for communication and data storage. Submission is in real time condition from field by using Survey123 application in mobile phone. Process data submission should be verified by Senior Operator using survey123 system verification, and automatic record in database and ORDC system. E-ORDC makes users more visible in the process of collecting data needed in the review process and continuing actions needed from finding. Data integration and suitability are also carried out as a proactive form in identifying a finding. From the results of this e-ORDC obtained good feedback from users and stakeholders. 99.83% SLO Field Operators have been actively utilizing with >3500 wells success to submitted e-ORDC YTD.

The digital transformation holds the most potential value for Oil and Gas Industry. In the study conducted by Oil & Gas IQ, 2018, over half of respondents believe that asset integrity and maintenance will benefit the most from digital transformation [3].

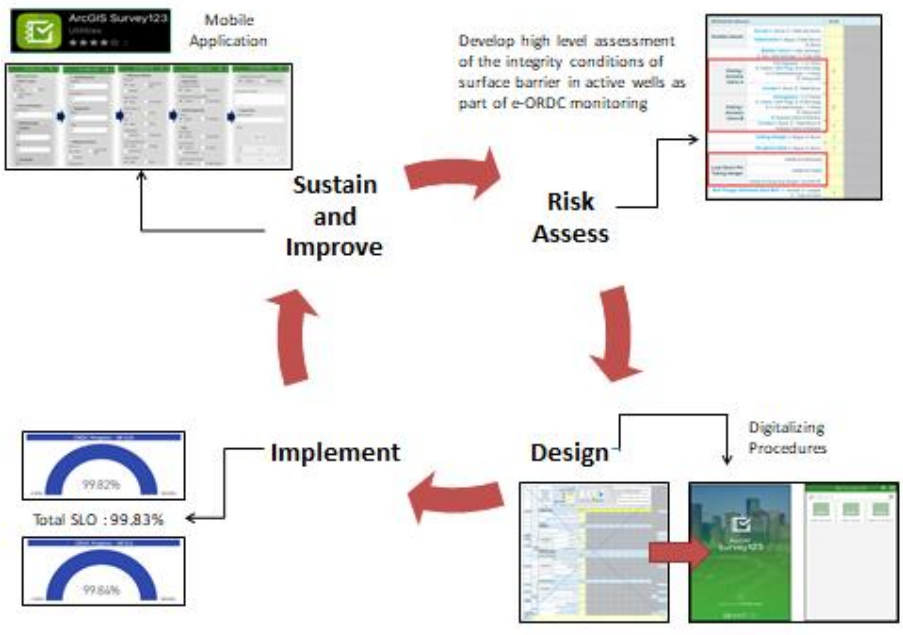

Figure 2. Lifecycle Approach to Managing Procedures

3.1 Safely Value from Proactive Assessment and Review

E-ORDC data result has been utilized for Monitoring high risk wells (high LEL (lower explosive limit), incomplete wellhead accessories, latest update of wellhead type installed, etc) by SSI teams. Based on the findings obtained, stakeholders will find it easier in the review process and program generation especially for finding issue related with high risk (abnormal wellhead conditions are often found leaks that would endanger the environment). Proactive prevention is carried out by proactively repairing wellheads/casings that indicate leaks. This work is also supported by the findings that often occur when rig is already on location and must be stopped due to the wellhead/casing issue, worst case is wellhead tilted/broken if proactive prevention is not conducted. But regardless of how well-designed and plan these safeguarding system are, they can only ever be fully effective if operated and maintained according to their design criteria.

3.2 Planning Efficiency for Scheduling Rig

Surface equipment completeness is required as early information for IODSC-LSC to prioritization scheduling well. Early information about finding related with surface conditions makes it easier to plan work on a well, especially for jobs that require a rig program. IODSC-LSC as the team that will manage the rig scheduling will really need data related to this actual condition earlier before prioritizing scheduling. With early finding, it will make it easier for the further coordination process to other related teams who will support the work. The e-ORDC data includes distance to surrounding community, access road and well pad condition. To be successful, the companies in the oil and gas industry needs to be fast and flexible. The result of a successful digital transformation is not the creation of a new organization, but its restructuring of the existing valuable assets in a new way. In other words, digital transformation is not only technological change but also the change in the tasks that management is facing [3].

4 Conclusion

ORDC is the process of checking wells on a daily routine basis for all active wells by looking at condition related with data for PE Review (Pressure, temperature, Load Amp), wellhead compliance requirement (Wellhead and Accessories, Leaking information), LEL Measurement and facility (distance to surrounding community, access road and well pad condition). Previous ORDC still have many gaps in data utilization in terms of timing, data quality, data prioritization and system of record. The new ORDC is utilize Survey123 application for communication and data storage. Submission is in real time condition from field by using Survey123 application in mobile phone. The new process would be improving the quality of corrective actions, effectively, reliably, paperless and prevent delay of wrong data submission. The result of a successful digital transformation is not the creation of a new organization, but its restructuring of the existing valuable assets in a new way.

Nomenclature

Symbol / Abbreviation	Definition	Unit
e-ORDC	Electronic-Operator Routine Duty Checklist	
MAH	Major Accident Hazard	
Load Amp	Load Ampere	(A)
LEL	Lower Explosive Limit	(%)
SLO	Sumatera Light Oil	
SSI	Subsurface Integrity	
LSC	Logistic Support Center	
IODSC	Integrated Optimization Decision Support Center	

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