Analysis of Well Intervention Team Meetings: Understanding the Actual Work of Integrated Operations

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Abstract. Given the specificity and complexity of activities related to the Integrated Operations (IO) in well interventions, many studies focused on the development and use of information and communication technologies, with fewer investigations addressing the human and organizational factors related to the actual work of its different actors. To overcome this gap this manuscript present and analyze data that demonstrates the main characteristics of well intervention team meetings and aspects that facilitate or hinder IO work. The strength of this study refers to the generate knowledge about actual work situations related to discussion spaces that bring together different specialists around well intervention projects. The lack of another published research focusing on the sharing of information and the exchange of experience in IO at drilling operations reinforces the relevance of the results of this paper for Ergonomics.

Keywords: Ergonomics · Well construction · Drilling · Integrated Operations · Team meetings

1 Background

Operational Integration (IO) refers to a type of work organization characterized by the sharing of data in real-time and communication between professionals from different specialties located in different geographical areas and organizational environments. In most companies, IO is operationalized through the implementation of shared workspaces, where onshore and offshore personnel cooperate through the integration of work processes, and technology [1].

Concerning drilling wells the development of technology for real-time data transfer has enabled remote monitoring and support for interventions in offshore wells, providing faster access to onshore information, reducing personnel on board, and costs of this

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type of operation [1]. Given this, we observed an increase in studies that focused on the development and use of information technologies that favor IO [2, 4]. However, because of the specificity and complexity of activities related to drilling, construction, and maintenance of wells, remote monitoring and operational support encounter challenges related to human and organizational factors that still need to be more investigated [1, 2].

Hence, since 2019, a team of researchers has been working on the study entitled. The operational support onshore in wells interventions: integrating performance and safety, which aims to increase the knowledge about the human factors linked to the work in this context.

In this realm, this article highlights the daily well intervention team meetings which are a pillar for collective work that supports IO. The objective is then to present and analyze data that demonstrates the main characteristics of these meetings and aspects that facilitate or hinder IO work.

2 Methods

This study was a qualitative investigation, and its procedures for collecting and analyzing data were guided by the theoretical framework of Activity Ergonomics (AE), which includes the following research stages: 1. demand analysis; 2. organizational, technical, economic, and social environment analysis; 3. Activity analysis and 4. A review of the results, a validation of the study, and formulation of recommendations to improve the work [5].

As mentioned in the previous section, this article presents some results of the project entitled *The operational support onshore in wells interventions: integrating performance and safety*. This research was carried out during the period from May 2019 until January 2021 and the first stages of ergonomic analysis (demand analysis, analysis of the technical and social environment and analysis of tasks, validation of the partial report) occurred between the months of May to December 2019.

Data and analysis specifically related to well intervention team meetings come from the time period between july and december of 2020. The data collection strategies were concentrated on non-participant observation of the Daily Meetings and on interviews held with professionals from different hierarchical levels who work in support of offshore well drilling operations.

Thus, 55 meetings were systematically monitored remotely, using the Teams® application, during the months of August to November 2020, comprising 68 h of observation. To validate the information collected by the researchers a remote meeting with the team leader and the Directional Engineer took place in december of 2020.

3 Results and Discussion

The results of this paper are presented from two perspectives: the first describes the well intervention team meetings context and organization and the second presents data from the observations of meetings that demonstrate, through actual work situations, aspects which facilitate or hinder IO work.

3.1 Well Intervention Team Meetings: Context and Organization

The well intervention team meetings are held daily and have an average duration of 1 h 30 min. The participants of these meetings are located in different onshore spaces and on the rigs as shown in Fig. 1.

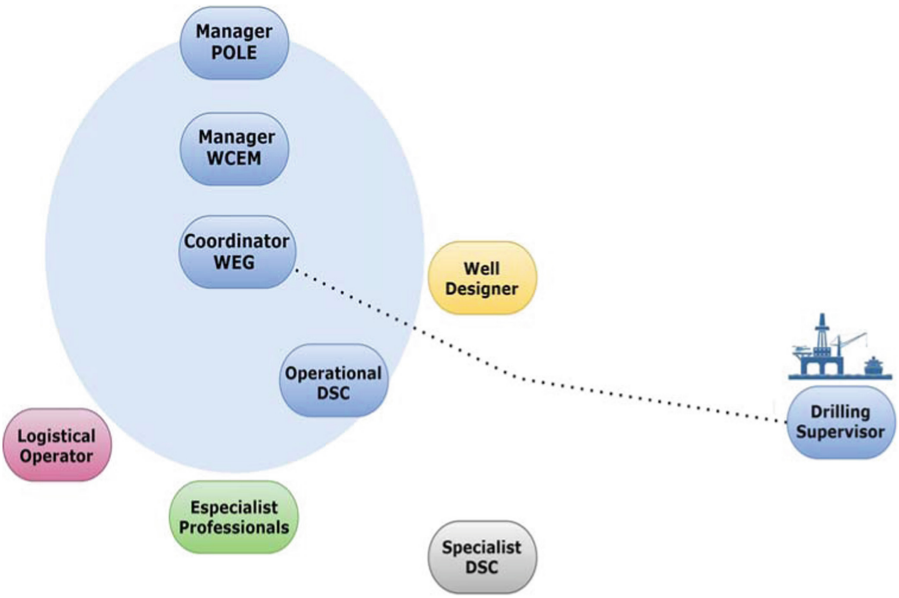

Fig. 1. The participants of these meetings.

In addition to the supervisors, who are located in the rigs, and the onshore operational support team, professionals who design the well interventions projects and specialists in different disciplines related to the field (i.e. cementation, fluids, logistics, safety, etc.) also participate in those meetings.

A member of the Decision Support Center (DSC) assumes the role of meeting coordinator. In general, there are three distinct moments in each meeting. The first takes about five minutes and consists of a presentation related to Health and Safety Management issues aiming to disseminate the safety culture.

The second moment of the meeting is the longest, as it focuses on the operational situation of all the rigs operating in a given field. In this stage, the whole team is presented with what has happened in each rig in the following sequence a) expose a summary of what happened in the operation from the last meeting to the present moment; b) address issues related to logistics, which may include the activity of support vessels, the need for material or equipment, among others; and c) if applicable, address the schedule regarding the embarkation and disembarkation of supervisors in the rig.

The final moment is reserved for general announcements, announcements about courses, disclosure of the day's meeting agenda, and other administrative reports.

3.2 Aspects Which Facilitate or Hinder the IO Which Were Observed Through Well Intervention Team Meetings

Regarding the role of this meeting for the IO work, the researchers identified that participation in these meetings favor a panoramic view of what happens in each rig. Since, outside business hours, only DSC members continue to monitor field operations. Therefore, the daily meeting allows the entire support team to become aware of what each rig faced the previous day (challenges faced, solutions found), what is happening at the moment, and the next steps of the operation.

This dimension of the meeting can be demonstrated by the discussion of a problem with a coring operation, that went unheard for an hour during the night. At the risk of compromising the sample or leaving equipment at the bottom of the well, the professionals opted to interrupt the operation and restart the maneuver.

The presentation of this situation at the well intervention team meetings allowed all members of the onshore support team to become aware of the challenges faced during the night, as well as of the decisions that were made. Also, it was possible to think about the consequences of the delay in the operation and to plan future actions to support the progression of operations concerning this rig.

The work analysis of the professionals involved in onshore support for well drilling operations, carried out in the first stages of the research, showed that the experience of these workers is fundamental to guarantee the safety and performance of interventions in wells.

In this scenario, the well intervention team meetings became a privileged stage for exchanging experiences, as professionals from different specialties and experiences, in different scenarios, come together to identify problems and build solutions for situations that cannot be fully anticipated.

To illustrate this dimension, we take the case of a rig that had problems in one of the stages of completion. During the presentation of this situation at the meeting, the support team initiated a debate to find hypotheses that would justify the reported difficulties, as well as the identification of possible risks and alternatives to face the problems. Previous events with similar characteristics were discussed and difficulties, that could increase the cost of that operation, were also listed.

The operational support work in well interventions deals with situations of high risks, high costs, and considerable uncertainty. Given this, it is often necessary to create discussion groups to deal with more complex situations. It was observed that during the well intervention team meetings, these complex situations are identified, as well as the planning of specific workgroups to address them is carried out.

Aspects observed in this research that can restrict the IO work in well intervention team meetings are related to the time restriction of the meeting and the volume or complexity of the cases discussed.

About the time restriction, it was found that the structure of the meetings does not allow in-depth discussions about the cases under analysis. This limit is imposed by the structure of the meeting, which establishes an average duration.

Although this barrier is mitigated by the possibility of creating new discussion groups, it should be noted that this resource reduces the group, restricting integration to

a small fraction of the team, in addition to being subject to the availability of the actors for meetings at other times of the workday.

Another barrier to IO work identified in the well intervention team meeting analysis occurs as the number of rigs to be presented at the meeting begins to increase. Since the greater the volume of rigs the shorter the time allocated for the presentation and discussion of each case. It is worth showing out the number of complex cases to be addressed at the meeting, which may aggravate this limiting factor, further reducing the sharing time of the other rigs.

4 Conclusions

This research aimed to present and analyze data that demonstrates the main characteristics of well intervention team meetings and aspects that facilitate or hinder IO work in these encounters. The strength of this study refers to the generate knowledge about actual work situations related to discussion spaces that bring together different specialists around well intervention projects. The lack of another published research focusing on the sharing of information and the exchange of experience in IO at drilling operations reinforces the relevance of the results of this paper for Ergonomics.

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