



A Study on IOGP Life-Saving Rules Among Workers in the Oil and Gas Industry

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DOI: <https://doi.org/10.30880/peat.2024.05.02.067>

Article Info

Received: 27 June 2024
Accepted: 15 July 2024
Available online: 25 November 2024

Keywords

Life-Saving Rules, Risk management,
Safety protocol, Workplace hazards,
Worker well-being

Abstract

This study evaluates the effectiveness of the International Association of Oil & Gas Producers (IOGP) Life-Saving Rules in ensuring worker safety within the oil and gas industry. These rules target high-risk activities and common workplace hazards, which are major causes of incidents and high-potential (HiPo) events. Primary data was collected through a questionnaire survey distributed to 524 oil and gas personnel, with a sample size of 217 determined using the Krejcie and Morgan Table. Secondary data included statistical incident reports and Unsafe Condition and Unsafe Act (UCUA) submissions. Findings reveal high individual knowledge scores but variable overall awareness, indicating a need for consistent education and training. The Level of Practice had a mean score of 2.97 (SD = 0.53), suggesting strong adherence to the rules. The study concludes that while overall knowledge about Life-Saving Rules is high, factors such as inconsistent communication and lack of a unified safety culture hinder optimal practice. Key recommendations for improvement include enhancing communication through various channels, continuous safety education through induction programs and toolbox talks, and frequent audits to ensure compliance and proactively address safety concerns. By addressing these factors, the study aims to enhance safety protocols, improve worker well-being, and strengthen organizational reputation within the oil and gas sector.

1. Introduction

The oil and gas industry are undeniably a crucial driver of the global economy, supplying the essential energy resources needed for transportation, manufacturing, and a diverse range of other activities. Safety practices in the oil and gas industry are essential for safeguarding personnel, maintaining environmental integrity, and upholding operational reliability (Vector Solutions, 2024). As the leading advocate for the industry on a global scale, the International Association of Oil & Gas Producers (IOGP) is committed to advancing safety, efficiency, and sustainability in energy provision, thereby facilitating the transition to a low-carbon future. Their membership comprises integrated energy firms, national oil companies, independent upstream operators, service providers, and industry associations, operating worldwide and collectively meeting over 40% of the world's oil and gas demand. For nearly half a century, they have served as a valuable platform for the upstream sector, fostering the exchange of expertise and best practices in safety, health, environment, engineering, and

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now, industry and energy transitions. Collaborating with over 2,250 experts from our member organizations, they aim to enhance industry performance through knowledge sharing and best practice dissemination (International Association of Oil & Gas Producers, 2024).

This industry operates within a complex and high-risk environment, facing various hazards and obstacles inherent to its exploration, extraction, transportation, and refining processes. Prioritizing the safety and well-being of its workforce is of utmost importance in striving for operational excellence. Acknowledging this critical need, IOGP introduced the Life-Saving Rules, which serve as a foundational element of safety management systems in numerous oil and gas operations worldwide. These rules aim to mitigate risks and prevent fatalities and serious injuries. This report outlines a set of IOGP Life-Saving Rules which can be used in the oil & gas industry to mitigate risk and reduce fatalities. The Rules focus on modifying worker and supervisor behaviours in the workplace by raising awareness of the activities which are most likely to result in fatalities and simple actions individuals can take to protect themselves and others (International Association of Oil & Gas Producers, 2018). IOGP has introduced an updated version of Report 459, featuring a streamlined set of Life-Saving Rules designed to enhance worker safety in the oil and gas sector. The aim is to encourage widespread adoption across the industry globally. With only nine rules compared to the original 18, the new set maintains a similar breadth of coverage as shown in Figure 1 below.

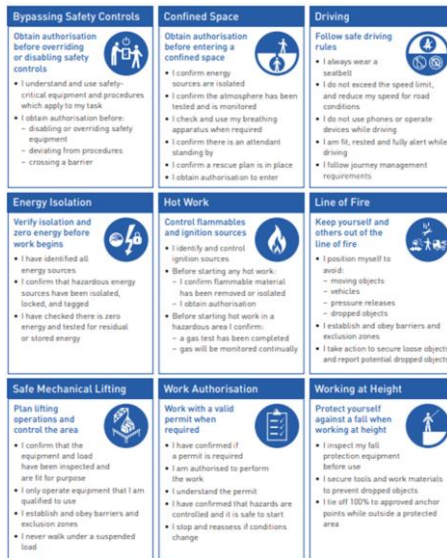


Fig 1. IOGP Life-Saving Rules

(Life-Saving Rules Task Force of the IOGP Safety Committee, 2018)

Despite the widespread adoption of IOGP Life-Saving Rules in the oil and gas sector, there is a pressing need to evaluate their effectiveness in ensuring worker safety. A significant challenge lies in the lack of a comprehensive understanding of the key factors influencing successful adherence to these rules and the current level of knowledge among personnel. According to (American Petroleum Institute, 2018), in 2016, there were 63 fatalities and an estimated 5,200 nonfatal injuries and illnesses reported among workers in the industries of oil and gas extraction, well drilling, and operations support. This study aims to assess and identify the level of knowledge and practice about Life-Saving Rules and determine the key factors that contribute to the successful implementation of the Life-Saving Rules among oil and gas workers.

2. Methodology

The research study utilized a combination of primary and secondary data collection methods. Primary data was gathered through a questionnaire survey distributed to personnel within the oil and gas industry, while secondary data utilized archived internal documents including statistical incident reports and UCUA

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submissions. These sources provide valuable insights into the factors influencing the successful implementation of the IOGP Life-Saving Rules, thereby enhancing worker safety.

2.1 Research Framework

In this study, there are three objectives constructed. The first and second objectives are to assess the level of knowledge about Life-Saving Rules among personnel working in the oil and gas sector and to identify the level of practice of Life-Saving Rules among personnel working in the oil and gas sector. In order to achieve these objectives, a survey questionnaire has been distributed among the oil and gas workers to collect the data. Lastly, we aim to determine key factors contributing to the successful implementation of the IOGP Life-Saving Rules for ensuring worker safety. By analyzing the questionnaire, we aim to uncover the main contributors to successful rule implementation among workers, offering insights beyond management levels. This approach allows us to gain a comprehensive understanding of the factors influencing rule adoption and adherence at all organizational levels. Ultimately, our goal is to raise awareness among both management and workers, promoting a shared commitment to workplace safety and a culture of vigilance.

2.2 Data Collection Method

The research study utilized a combination of primary and secondary data collection methods. Primary data was gathered through a questionnaire survey distributed to personnel within the oil and gas industry, while secondary data utilized archived internal documents including statistical incident reports and UCUA submissions. These sources provide valuable insights into the factors influencing the successful implementation of the IOGP Life-Saving Rules, thereby enhancing worker safety.

Utilizing the Krejcie and Morgan table enables researchers to select a sample that faithfully represents the target population, thus reducing the likelihood of sampling errors and bolstering the credibility of study findings. Furthermore, this method ensures transparency and replicability, as adhering to established guidelines allows for the validation of outcomes by other researchers utilizing similar sampling approaches. For this study, the total number of targeted Oil and Gas workers is $n = 524$. Hence, the size of the sample determined by using the Krejcie and Morgan Table is $s = 217$.

Table for Determining Sample Size from a Given Population					
N	S	N	S	N	S
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368

Figure 2 Table for Determining Sample Size from a Given Population (Krejcie & Morgan, 1970)

A preliminary survey, known as a pilot survey, will be carried out prior to the main survey. The purpose of this pilot survey is to assess the respondents' comprehension of the questions and rectify any deficiencies in the survey questionnaire, such as spelling errors, intended meanings, formatting, or wording (Isa, 2017). According to (Edwards, 2024), a pilot test is an essential step in any survey process. From his experience, he recommends selecting a sample size equivalent to 5-10% of your total target audience for the pilot. This provides an opportunity to review and refine the survey questionnaire, including editing, structuring, and ordering, before

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launching the survey to all respondents. Adjustments can be made during this phase to ensure the survey is optimized before its full rollout. Hence, this pilot study involved a total of 26 people, 14 of them are from the HSSE team and the remaining 12 are interns from various departments.

SPSS, which stands for Statistical Package for the Social Sciences, is a software widely utilized by researchers of various disciplines to conduct complex statistical analysis. The latest version, which is SPSS version 29.0.1 will be used as a tool to analyze the data in this study.

3. Result and Discussion

Data from all respondents were collected and analyzed using IBM SPSS Version 29.0.1 to ensure effective results. The findings focus on the level of knowledge and practice concerning the IOGP Life-Saving Rules among Oil & Gas workers, using data from the questionnaires and statistical software analysis.

Cronbach's Alpha is frequently utilized in research to assess an instrument or scale's reliability or internal consistency. Cronbach's Alpha test indicated that the survey used in this study is both reliable and valid, as the obtained value exceeds the threshold of 0.7. Specifically, the Cronbach's Alpha value was calculated to be 0.705, as shown in the table below.

Table 1 Reliability Statistics

Variables	N of Items	Cronbach's Alpha
Level of Knowledge	7	0.93
Level of Practice	10	0.83
Key Factors	10	0.80
Overall	27	0.70

3.1 Level of Knowledge about Life-Saving Rules

These findings highlight a generally high level of knowledge and awareness of Life-Saving Rules among the respondents, supported by ongoing training and resources. Based on the table below, the Level of Knowledge section of the survey questionnaire includes 7 items. The high percentage of respondents who can articulate the importance of understanding and adhering to these rules (88.4%) demonstrates a strong foundational knowledge.

Shell remains committed to enhancing safety culture and leadership within its workforce, including both employees and contractor staff, in line with its dedication to prioritizing the well-being of individuals. The implementation of the industry-wide set of nine Life-Saving Rules at Shell commenced on January 1, 2022. By the conclusion of the year, approximately 126,000 personnel, including staff and contractors, had undergone mandatory e-learning on these new rules (Shell, n.d.). Apart from that, according to (INEOS, 2021), their Life-Saving Rules are integrated into their General Terms and Conditions of the site, requests for proposals, contracts, and site standards. Additionally, all of their employees have been provided with cards containing the Life-Saving Rules. Meanwhile, their partner company employees receive information about the Rules through their partner company coordinators and the Life-Saving Rules are also accessible on their website.

Table 2 Level of Knowledge Description Analysis

No.	Item	Variable	Frequency	Percentage (%)
1	Are you aware of IOGP Life-Saving Rules?	Yes	124	80
		No	31	20
2	I know what IOGP Life-Saving Rules is.	Yes	124	80
		No	31	20
3	I understand what Life-Saving Rules are.	Yes	125	80.6
		No	30	19.4
4	I can name at least three (3) Life-Saving Rules	Yes	121	78.1
		No	34	21.9
5	I do receive training or updates on Life-Saving Rules.	Yes	105	67.7
		No	50	32.3
6	I always refer to the IOGP website to get updates on Life-Saving Rules.	Yes	89	57.4
		No	66	42.6
7	I understand the importance of understanding and following Life-Saving Rules.	Yes	137	88.4
		No	18	11.6

3.2 Level of Practice about Life-Saving Rules

Based on the table, the Level of Practice section of the survey reveals strong adherence to safety practices among respondents. Notably, 78.1% "Always" wear appropriate PPE as required by the Life-Saving Rules, and 72.3% "Never" wear PPE only when they remember or deem it necessary. Additionally, 72.9% "Always" feel accountable for ensuring compliance with the rules, and 71.6% "Never" believe they can skip safety procedures due to their experience. Further analysis indicates that 67.7% "Always" follow the Life-Saving Rules in their daily activities, and 66.5% "Always" speak up if safety procedures are not being followed. Moreover, 63.9% feel confident in recognizing and responding to potential safety hazards, 56.1% "Always" intervene or report rule violations, and 53.5% feel confident that their colleagues adhere to these rules. Lastly, 49.7% "Rarely" witness violations of the Life-Saving Rules in their workplace. These results collectively indicate a strong culture of safety and compliance among the respondents.

Table 3 Level of Practice Description Analysis

No.	Item	Variable	Frequency	Percentage (%)
1	I consistently follow Life-Saving Rules in my daily work activities.	Never	7	4.5
		Rarely	13	8.4
		Often	30	19.4
		Always	105	67.7
2	I have witnessed violations of Life-Saving Rules in my workplace.	Never	28	18.1
		Rarely	77	49.7
		Often	29	18.7
		Always	21	13.5
3	I actively intervene or report when I observe violations of Life-Saving Rules in my workplace.	Never	15	9.7
		Rarely	21	13.5
		Often	32	20.6
		Always	87	56.1
4	I am likely to speak up if I feel that safety procedures, including Life-Saving Rules, are not being followed.	Never	11	7.1
		Rarely	11	7.1
		Often	30	19.4
		Always	103	66.5
5	I feel confident that my colleagues adhere to Life-Saving Rules in their work activities.	Never	7	4.5
		Rarely	9	5.8
		Often	56	36.1
		Always	83	53.5
6	I am confident in my ability to recognize and respond to potential safety hazards in accordance with Life-Saving Rules.	Never	9	5.8
		Rarely	7	4.5
		Often	40	25.8
		Always	99	63.9
7	I feel accountable for ensuring compliance with Life-Saving Rules in my workplace.	Never	4	2.6
		Rarely	12	7.7
		Often	26	16.8
		Always	113	72.9
8	I consistently wear appropriate Personal Protective Equipment (PPE) as required by Life-Saving Rules.	Never	5	3.2
		Rarely	8	5.2
		Often	21	13.5
		Always	121	78.1
9	Because I have never experienced accidents, injuries, or occupational illnesses, I will only wear PPE when I remember or when necessary.	Never	112	72.3
		Rarely	16	10.3
		Often	9	5.8
		Always	18	11.6
10	Because I have been working for a long time, I believe I can skip some safe work procedures	Never	111	71.6
		Rarely	14	9.0
		Often	14	9.0
		Always	16	10.3

Table 4 Level of Practice on Life-Saving Rules

Variables	Mean	Std. Deviation	Practice Level
Level of Practice	2.97	0.53	High

The analysis shows that the mean score for the Level of Practice variable is 2.97 (SD = 0.53), placing it in the "High" category defined by Alico and Guimba (2015), which ranges from 2.50 to 3.24. This indicates a strong adherence to Life-Saving Rules among oil and gas workers. Research findings reveal that workers consistently wear appropriate PPE, ensure compliance with safety procedures, and report or intervene when observing violations. They are also confident in recognizing and addressing potential safety hazards. This consistent adherence to safety protocols underscores the workers' commitment to maintaining a safe working environment.

The high mean score not only highlights the industry's focus on safety but also reflects the effectiveness of training programs and safety policies in place. Workers' proactive behaviour in following safety rules and their accountability for ensuring compliance are crucial in fostering a culture of safety. In conclusion, the high mean score reflects a solid commitment to safety practices within the industry. This adherence to and implementation of Life-Saving Rules contributes to a safer work environment in the oil and gas sector, demonstrating the industry's dedication to protecting its workforce.

The Galp Life Saving Rules (GLSR) have been formulated to enhance workplace safety by requiring employees to adhere to a set of fundamental principles as part of their daily routines. By implementing these rules, which are based on those established by the International Association of Oil & Gas Producers (IOGP), Galp aims to achieve maximum alignment with industry peers, as these rules are widely recognized and enforced by other companies in the sector (Galp, 2024). This alignment with IOGP standards not only standardizes safety protocols but also reinforces a unified approach to risk management, further solidifying the industry's overall safety culture. Continuous training and adherence to these well-established guidelines ensure that all employees are equipped with the necessary knowledge and skills to maintain high safety standards. This collective effort across the industry exemplifies a commitment to ongoing improvement and a proactive stance in safeguarding the workforce.

**Table 5 Mean Score Interpretation for Level of Practice
(Alico & Guimba, 2015)**

Mean Score	Practice Level
1.00 – 1.74	Low
1.75 – 2.49	Moderate
2.50 – 3.24	High
3.25 – 4.00	Very High

4. Conclusion

The findings show a high level of knowledge and awareness of Life-Saving Rules among oil and gas workers, supported by ongoing training and accessible resources. Respondents' ability to explain and recall specific rules indicates a strong understanding and practical application in the workplace, which is crucial for safety and preventing incidents. Continuous education and training through Safety Inductions, Toolbox Talks, Lessons Learned sessions, and Lunch & Learn programs will help maintain this high level of knowledge. Proactively consulting resources like the IOGP website for updates further strengthens the culture of safety. Overall, the combination of initial education, ongoing training, and accessible resources fosters a strong adherence to Life-Saving Rules, creating a safer work environment in the oil and gas industry.

Furthermore, the study findings show that oil and gas industry workers demonstrate high levels of adherence to Life-Saving Rules. Most respondents consistently use appropriate PPE, take responsibility for safety compliance, and report violations. They regularly apply these rules in their daily tasks and feel confident in identifying and addressing safety hazards. Overall, the survey indicates a strong commitment to safety practices in the industry, with respondents showing proactive behaviour that enhances a culture of safety and contributes to a safer workplace environment.

Lastly, the top three key factors for successful implementation include clear communication, enhanced training initiatives, and frequent audits and inspections, all support in ensuring the successful implementation of Life-Saving Rules and fostering a robust safety culture within the oil and gas industry. The study faced limitations that affected its comprehensiveness and accuracy. A short nine-day data collection period restricted responses and failed to reach the target number of participants. Using WhatsApp for a voluntary survey distribution led to the potential inclusion of irrelevant responses and made it hard to verify respondents' industry affiliation. Self-selection bias and lower response rates were also part of the concerns. Social

desirability bias and language proficiency issues further impacted the survey's reliability. These limitations highlight areas for improvement in future research interpretation and methodology.

Future research that can be built from this study are by investigating factors influencing the adoption of Life-Saving Rules among oil and gas workers, including individual, organizational, and environmental factors. Understanding these dynamics can inform strategies to enhance compliance. Additionally, evaluating the effectiveness of various training programs like Safety Induction, Toolbox Talks, Lessons Learned sessions, and Lunch & Learn programs in improving safety knowledge and practice can identify best practices for future training designs. Furthermore, studying how organizational culture, including leadership, communication, and employee engagement, influences Life-Saving Rule adoption can provide insights into fostering a strong safety culture within oil and gas companies. Addressing these areas in future research will deepen understanding of safety compliance mechanisms, leading to more effective safety interventions and safer working environments.

Acknowledgement

The author would like to thank all members of the Faculty of Engineering Technology, University Tun Hussein Onn Malaysia, and all of the staff in this Oil and Gas company based in Kuala Lumpur for all of their support, guidance, mentoring and encouragement during the whole research journey.

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Conflict of Interest

Authors declare that there is no conflict of interests regarding the publication of the paper.

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Author Contribution

The authors confirm contribution to the paper as follows: **study conception and design:** Fatin Qaisara Mohd Rizal, Nurrul Hafeezah Sahak, Hazrizal Ab Rahim; **data collection:** Fatin Qaisara Mohd Rizal; **analysis and interpretation of results:** Fatin Qaisara Mohd Rizal, Nurrul Hafeezah Sahak; **draft manuscript preparation:** Fatin Qaisara Mohd Rizal. All authors reviewed the results and approved the final version of the manuscript.

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