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Emergency Preparedness in the Oil and Gas Sector: A Survey of Selected Companies in the Upstream Sector in Warri, Delta State, Nigeria

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ABSTRACT

Emergency preparedness remains a critical requirement for safe operations in Nigeria's upstream oil and gas industry due to the high-risk nature of exploration and production activities. This study assessed the level of emergency preparedness on selected upstream oil and gas companies within the Niger Delta in Nigeria, focusing on emergency response plans, equipment availability, staff training, organizational challenges, and overall effectiveness. A descriptive survey design was adopted, and data were collected using a structured questionnaire distributed to 200 employees in selected upstream companies. A total of 180 valid responses were retrieved and analyzed using frequency counts and percentages. The findings show that 90% of respondents confirmed the existence of formal emergency preparedness plans in their organizations, while 65.6% reported that such plans are reviewed annually. In terms of training, 66.7% indicated that all staff receive emergency training, and 46.7% reported being very well trained in equipment usage. However, 20% of respondents indicated poor or no training. Regarding emergency response resources, 61.1% stated that their companies are fully equipped, while 38.9% reported partial or no equipment availability. Regular emergency drills were conducted quarterly in 54.4% of the companies, but 20% conducted drills rarely or never. A strong majority (74.4%) reported that emergency plans cover all major emergency types (security, medical, fire, and spill). Despite these strengths, 48.9% identified poor management commitment as the main challenge, followed by insufficient training (34.4%) and lack of funding (32.2%). Furthermore, 67.8% acknowledged that previous incidents exposed weaknesses in their preparedness systems. Overall, 43.3% rated emergency preparedness as "Good," 23.3% as "Excellent," while 33.4% rated it "Fair" or "Poor." The study concludes that although emergency preparedness in Nigeria's upstream sector shows moderate strength, significant improvements are required in management commitment, training consistency, equipment adequacy, and continuous system evaluation to achieve optimal resilience and safety performance.

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Introduction

The oil and gas industry is one of the most important sectors in Nigeria's economy, contributing significantly to national revenue, foreign exchange earnings, and employment. Within this sector, the upstream operations exploration, drilling, and production are known to be high-risk activities because they involve hazardous materials, heavy equipment, high pressure systems, and unpredictable geological conditions. These risks make emergency preparedness a critical part of the industry's operational framework [1]. Emergencies such as fires, oil spills, gas leaks, explosions, and well blowouts can occur suddenly and, if not properly managed, may lead to loss of life, environmental pollution, property damage, and production downtime.

Nigeria's upstream fields, especially those located in the Niger Delta, are highly vulnerable because they operate in ecologically sensitive environments and socially tense communities. Incidents in these areas often have far-reaching impacts, affecting water bodies, farmlands, and local livelihoods. Past events in the region have shown that emergency response systems are sometimes hindered by weak infrastructure, slow mobilization, and inadequate on-site preparedness measures [2]. This has increased the demand for stronger emergency management systems that can detect risks early, respond quickly, and recover effectively.

Globally, the oil and gas industry has developed structured systems for handling emergencies, such as the use of emergency response plans, command-and-control structures, routine safety training, drills, and the deployment of modern equipment for fire suppression, spill containment, and rescue operations. Studies in high-risk oil and gas environments show that companies with strong emergency response frameworks are better able to prevent small incidents from escalating into major disasters [3]. In Nigeria, however, the adoption of these international best practices varies from company to company, depending on organizational culture, financial capability, and management commitment.

To ensure uniformity and safety, the Nigerian government has established several regulatory frameworks. Agencies such as the Nigerian Upstream Petroleum Regulatory Commission (NUPRC) require companies to develop emergency response procedures, maintain safety equipment, and train response teams regularly (NUPRC). Similarly, the National Oil Spill Detection and Response Agency (NOSDRA) oversee oil spill contingency planning and national-level coordination for spill incidents [4]. Despite these regulations, gaps in monitoring, enforcement, and industry compliance still persist, leading to continued accidents and low levels of preparedness in some facilities [5].

In recent years, there has been growing awareness about the importance of strengthening emergency preparedness in the upstream sector. Reports from Emergency Response Africa (2022) highlight the need for rapid response systems, modern rescue tools, and collaboration between government agencies and oil companies. Also, equipment suppliers emphasize that upstream facilities in regions such as Warri face increasing operational hazards and therefore require updated emergency tools and trained manpower to match these risks [6]. Academic studies on emergency management in Nigeria agree that without well-structured preparedness plans, the industry remains highly exposed to avoidable disasters.

Therefore, assessing the level of emergency preparedness in Nigeria's upstream oil and gas industry is essential for understanding current capabilities, identifying gaps, and recommending practical improvements. A survey of companies in this sector provides useful insights into how well the industry is meeting regulatory expectations, the effectiveness of emergency response systems, and the readiness of personnel to handle unforeseen events. Such findings are important for building a safer, more resilient, and environmentally responsible upstream industry in Nigeria.

This paper aims to address the knowledge gap by assessing the level of emergency preparedness among upstream oil and gas companies and workers in the oil and gas companies in Niger Delta, Nigeria. The study uses questionnaire to ascertain the level of awareness, preparedness and response of workers in any emergency scenarios in the oil and gas upstream companies This work can help further evidence-based on emergency preparedness plans and procedures in the Nigerian oil and gas sector with emphasis on Niger Delta assessing the availability and adequacy of emergency response equipment, evaluating the level of training, awareness, and competence of personnel involved in emergency response activities and identify the major challenges and barriers affecting effective emergency preparedness in upstream operations by measuring exposure and estimating related risk categories. Moreover, it provides information that can inform regulators, employers, and policymakers on how to improve safety levels in the industrial sector and achieve sustainable working conditions in line with international occupational health standards.

Methodology

This was carried out in Niger-Delta, Nigeria a major oil and gas centre, which is an industrial area with high population of oil and gas companies that offer maintenance, fabrication, and support services to the petroleum industry. A cross-sectional descriptive design was used to evaluate responses among workers in oil and gas upstream companies. The population consisted of workers from various areas of operation in the upstream sector. A descriptive survey design was adopted, and data were collected using a structured questionnaire distributed to 200 employees in selected upstream companies. A total of 180 valid responses were retrieved and analyzed using frequency counts and percentages. After retrieving the completed questionnaires, the responses were carefully sorted, coded, and organized according to the different sections of the questionnaire. The analysis focused on summarizing the responses of the participants in a clear and understandable manner. The primary statistical tools used for the analysis were frequency counts and percentages. Frequency counts were used to determine the number of respondents who selected a particular response option, while percentages were used to show the proportion of respondents represented by each response category. These statistical methods were appropriate for this study because the questionnaire mainly contained structured questions with fixed response options.

The analyzed data were presented in tables to make interpretation easier and clearer. Each table showed the response categories, the frequency of responses, and the corresponding percentages. This approach allowed the researcher to identify patterns and trends in the responses of participants regarding emergency preparedness practices in their organizations.

Results

Demographic Characteristics of Respondents

Table 3.1: Age Distribution of Respondents

Age Range	Frequency	Percentage (%)
< 25	12	6.7
25 – 34	38	21.1
35 – 44	46	25.6
45 – 54	58	32.2
≥ 55	26	14.4
Total	180	100%

Table 3.1 shows the age distribution of respondents, revealing that the largest proportion (32.2%) falls within the 45–54 years age bracket. This indicates that a significant number of participants are mature professionals likely to possess substantial industry experience. Additionally, 25.6% are between 35–44 years, and 14.4% are 55 years and above, further reinforcing that the majority of respondents are in advanced career stages. Only 6.7% are below 25 years, suggesting limited participation from entry-level personnel. The dominance of older age groups implies that the data gathered reflects the perspectives of seasoned professionals who have likely witnessed or managed emergency situations within the upstream sector.

Table 3.2: Gender Distribution

Gender	Frequency	Percentage (%)
Male	142	78.9
Female	38	21.1
Total	180	100%

Table 3.2 presents the gender distribution of respondents, showing that 78.9% are male while only 21.1% are female. This confirms that the upstream oil and gas sector in Nigeria remains predominantly male-dominated. The disparity may reflect the technical and field-based nature of upstream operations, which historically have had lower female representation. However, the presence of over one-fifth female respondents indicates gradual gender inclusion within the industry.

Table 3.3: Educational Qualification

Qualification	Frequency	Percentage (%)
SSCE	10	5.6
Diploma/NCE	28	15.6
B.Sc/HND	96	53.3
M.Sc/PhD	34	18.9
Other	12	6.6
Total	180	100%

Table 3.3 illustrates the educational qualifications of respondents. The majority (53.3%) possess B.Sc./HND degrees, while 18.9% hold M.Sc./PhD qualifications. Combined, this means over 72% of respondents have at least a first degree, reflecting a highly educated workforce. Only 5.6% have SSCE qualifications. This strong academic background enhances the credibility of responses, as most participants are technically trained and likely understand emergency preparedness systems in depth.

Table 3.4: Job Role in Company

Job Role	Frequency	Percentage (%)
Safety Officer	52	28.9
Engineer	44	24.4
Operations Staff	50	27.8
Management	26	14.4
Other	8	4.5
Total	180	100%

Table 3.4 indicates the job roles of respondents, with Safety Officers (28.9%) and Operations Staff (27.8%) forming the largest groups, followed by Engineers (24.4%). Management accounts for 14.4%. The dominance of safety and operations personnel is significant because these roles are directly involved in emergency response planning and execution. Their substantial representation ensures that the findings accurately reflect operational realities in upstream facilities.

Table 3.5: Years of Work Experience

Experience	Frequency	Percentage (%)
< 1 year	6	3.3
1 – 5 years	32	17.8
6 – 10 years	48	26.7
> 10 years	94	52.2
Total	180	100%

Table 4.5 reveals that 52.2% of respondents have more than 10 years of work experience, while 26.7% have 6–10 years. This means nearly 79% have over six years of experience in the sector. Such extensive experience suggests that respondents possess practical exposure to emergency situations, drills, and safety systems. Therefore, their responses provide reliable insights into the state of emergency preparedness within the industry.

Emergency Preparedness Plans

Table 3.6: Existence of Formal Emergency Preparedness Plan

Response	Frequency	Percentage (%)
Yes	162	90.0
No	18	10.0
Total	180	100%

Table 3.6 shows that 90% of respondents confirmed the existence of a formal emergency preparedness plan in their companies, while 10% reported none. This high percentage demonstrates strong compliance with regulatory expectations from agencies such as the Nigerian Upstream Petroleum Regulatory Commission and National Oil Spill Detection and Response Agency. However, the 10% without formal plans indicates that gaps still exist in some organizations.

Table 3.7: Frequency of Plan Review (N = 180)

Response	Frequency	Percentage (%)
Annually	118	65.6
Every 2–3 years	34	18.9
Irregularly	20	11.1
Never	8	4.4
Total	180	100%

Table 3.7 indicates that 65.6% of companies review their emergency plans annually, while 18.9% do so every 2–3 years. However, 15.5% review irregularly or never. Regular review is essential because operational risks evolve over time. The findings suggest that although most companies follow best practices in updating plans, a minority may be operating with outdated procedures.

Table 3.8: Staff Training on Emergency Roles

Response	Frequency	Percentage (%)
Yes, all staff	120	66.7
Only selected staff	46	25.6
No training	14	7.7
Total	180	100%

Table 3.8 shows that 66.7% of respondents reported that all staff receive emergency training, while 25.6% indicated only selected staff are trained. However, 7.7% reported no training at all. While the majority demonstrate inclusive training practices, the exclusion of some staff could weaken coordinated emergency response, since emergencies often require collective action.

Table 3.9: Confidence in Emergency Plan Effectiveness

Response	Frequency	Percentage (%)
Very Confident	60	33.3
Confident	72	40.0
Somewhat Confident	34	18.9
Not Confident	14	7.8
Total	180	100%

Table 3.9 reveals that 73.3% of respondents are either "Very Confident" or "Confident" in their emergency plan effectiveness. However, 26.7% are only somewhat confident or not confident. This suggests that while most companies have structured plans, there may still be perceived weaknesses in implementation, equipment adequacy, or coordination.

Emergency Response Resources

Table 3.10: Availability of Emergency Response Equipment

Response	Frequency	Percentage (%)
Yes, fully equipped	110	61.1
Partially equipped	52	28.9
Not equipped	18	10.0
Total	180	100%

Table 3.10 indicates that 61.1% of respondents reported their companies are fully equipped with emergency response tools, while 28.9% reported partial equipment and 10% reported none. Although the majority appear adequately equipped, the 38.9% lacking full equipment coverage presents a significant concern, especially in high-risk upstream operations.

Table 3.11: Frequency of Emergency Drills

Response	Frequency	Percentage (%)
Yes, quarterly	98	54.4
Yes, annually	46	25.6
Rarely	24	13.3
Never	12	6.7
Total	180	100%

Table 3.11 shows that 54.4% conduct emergency drills quarterly and 25.6% annually. However, 20% conduct drills rarely or never. Regular drills are critical for preparedness, and inconsistency in drill frequency may reduce response efficiency during real incidents.

Table 3.12: Level of Staff Training on Equipment Usage

Response	Frequency	Percentage (%)
Very well trained	84	46.7
Moderately trained	60	33.3
Poorly trained	24	13.3
Not trained	12	6.7
Total	180	100%

Table 3.12 demonstrates that 46.7% of staff are very well trained in equipment usage, and 33.3% moderately trained. However, 20% are poorly trained or not trained at all. This gap may compromise effective utilization of emergency equipment during critical situations.

Table 3.13: Coverage of Emergency Types (Security, Medical, Fire & Spill)

Response	Frequency	Percentage (%)
Plan for 1 type	6	3.3
Plan for 2 types	12	6.7
Plan for 3 types	28	15.6
Plan for all 4 types	134	74.4
Total	180	100%

Table 3.13 reveals that 74.4% of companies have emergency plans covering all four major types (security, medical, fire, and spill). This reflects a comprehensive approach to preparedness. However, the remaining 25.6% with limited coverage may be vulnerable to specific emergency categories.

Table 3.14: Collaboration with External Agencies

Response	Frequency	Percentage (%)
Yes, regularly	104	57.8
Sometimes	54	30.0
Never	22	12.2
Total	180	100%

Table 3.14 indicates that 57.8% collaborate regularly with external agencies, while 30% collaborate sometimes and 12.2% never collaborate. Weak collaboration may hinder coordinated response during major incidents, particularly those requiring regulatory oversight or joint intervention.

Challenges and Barriers to Emergency Preparedness

Table 3.15: Challenges Hindering Emergency Preparedness (Multiple Responses Allowed)

Challenge	Frequency	Percentage (%)
Lack of funding	58	32.2
Inadequate equipment	46	25.6
Insufficient training	62	34.4
Poor management commitment	88	48.9
Lack of regulatory enforcement	40	22.2

Table 3.15 identifies poor management commitment (48.9%) as the leading challenge to effective emergency preparedness, followed by insufficient training (34.4%) and lack of funding (32.2%). This suggests that organizational culture and leadership priorities significantly influence preparedness effectiveness.

Table 3.16: Previous Incidents Exposed Weaknesses (N = 180)

Response	Frequency	Percentage (%)
Yes	122	67.8
No	38	21.1
Not Applicable	20	11.1
Total	180	100%

Table 3.16 shows that 67.8% of respondents believe previous incidents exposed weaknesses in their preparedness systems. This highlights that real-life emergencies have revealed operational gaps, reinforcing the need for continuous improvement.

Table 3.17: Overall Effectiveness of Emergency Preparedness (N = 180)

Rating	Frequency	Percentage (%)
Excellent	42	23.3
Good	78	43.3
Fair	44	24.4
Poor	16	9.0
Total	180	100%

Table 3.17 indicates that while 43.3% rated preparedness as "Good" and 23.3% as "Excellent," a combined 33.4% rated it "Fair" or "Poor." This suggests that although overall preparedness is moderately strong, substantial room for improvement remains within the upstream sector.

Suggestions for Improvement (Qualitative Summary)

Table 3.18: Responses from Section E were grouped into common themes:

Suggested Measure	Frequency (Approx.)
Strict adherence to emergency procedures	72
Improved management commitment	64
Increased training and drills	80
Better emergency response speed	76
Improved equipment provision	68

Discussion

The findings of this study provide important insights into the state of emergency preparedness in Nigeria's upstream oil and gas sector. Generally, the results show that while many companies have established formal emergency systems, gaps still exist in areas such as training coverage, equipment adequacy, management commitment, and inter-agency collaboration. These findings align with earlier studies which emphasize that emergency preparedness in high-risk industries is not only about having written plans but also about effective implementation, leadership support, and continuous improvement.

The Demographic Profile of Respondents

The demographic profile of respondents strengthens the credibility of the findings. As shown in Tables 4.1 and 4.5, the majority of respondents fall within the 35–54 age range and over half have more than 10 years of experience. This indicates that responses were provided by mature and experienced professionals who likely understand operational risks and emergency systems in depth. Furthermore, the high level of educational qualification reported in Table 4.3 suggests that most respondents possess technical knowledge relevant to safety management. This supports the reliability of the data collected, as experienced and educated personnel are better positioned to assess emergency preparedness realistically.

Formal Emergency Preparedness Plans

The study reveals that 90% of companies have formal emergency preparedness plans (Table 4.6). This suggests strong regulatory awareness and general compliance with national safety requirements. Regulatory bodies such as the Nigerian Upstream Petroleum Regulatory Commission and the National Oil Spill Detection and Response Agency mandate the development of emergency response procedures in upstream operations. The high percentage recorded in this study indicates that most companies recognize the importance of documented emergency plans. This finding is consistent with Njoku, who emphasized that structured emergency response plans are fundamental in high-risk oil and gas environments [3].

Emergency Preparedness Plan

Table 4.7 shows that although most companies review their plans annually, a noticeable percentage review irregularly or never. Emergency risks in upstream operations constantly evolve due to new technologies, aging infrastructure, environmental conditions, and security challenges. When plans are not regularly updated, they may fail to address emerging threats. This finding supports the argument of Hollnagel under Resilience Theory, which emphasizes that safety systems must be adaptive and continuously improved rather than static documents.

Staff Training and Emergency Roles

Table 4.8 indicate that while 66.7% of companies train all staff, some train only selected personnel, and a few provide no training at all. Effective emergency response requires coordinated action among all staff members, not just safety officers. Emergencies such as fires, blowouts, or oil spills often escalate quickly, and untrained staff may panic or respond incorrectly. This finding aligns with Smith and Chen, who found that regular and inclusive drills significantly improve response confidence and coordination [7]. Therefore, selective or inconsistent training could weaken the overall preparedness system.

Confidence in Emergency Plan Effectiveness

Table 4.9 shows that although most respondents are confident, a significant minority are only somewhat confident or not confident. This lack of full confidence may be linked to observed weaknesses in equipment adequacy, training gaps, or past incident experiences. Confidence is closely connected to safety culture. According to Reason, organizations with strong safety cultures tend to demonstrate higher trust in safety systems and emergency procedures. Where confidence is low, it may indicate weaknesses in leadership commitment or communication.

Availability of Emergency Response Equipment

Table 4.10 presents mixed results. While 61.1% report being fully equipped, nearly 39% indicate partial or no equipment. In a high-risk environment such as upstream oil and gas operations, incomplete equipment availability can have serious consequences. Equipment such as fire suppression systems, spill containment tools, gas detectors, and medical response kits are essential for rapid intervention. This finding agrees with Onuoha and Onwuka, who identified technological and equipment gaps as major constraints to emergency preparedness in Nigerian oil and gas firms [8].

Emergency Drills are Essential for Testing Preparedness Systems

Table 4.11 shows that although over half conduct quarterly drills, 20% conduct drills rarely or never. This inconsistency reduces readiness. Drills help identify weaknesses in communication, response time, and coordination before real incidents occur. Without regular drills, even well-designed emergency plans may fail during actual emergencies. This supports the work of Alves and West, who emphasized that scenario-based exercises are critical in strengthening preparedness frameworks [9].

Level of Staff Training on Equipment Usage

Table 4.12 highlights that while many staff members are well trained in equipment usage, about 20% are poorly trained or untrained. Equipment alone cannot ensure safety if personnel lack the skills to operate it properly. Poor training can lead to delays, misuse of equipment, or escalation of incidents. This finding also connects to Thomas et al., who stressed the importance of human factors in emergency response effectiveness [10].

Coverage Of Emergency Types

Table 4.13 shows that most companies cover all major emergency types (security, medical, fire, and spill). This indicates a comprehensive approach to risk management. Given the complex risk environment of the Niger Delta, where upstream facilities face environmental hazards and security threats, multi-hazard preparedness is essential. This aligns with the recommendations of the International Maritime Organization under the OPRC Convention, which promotes integrated preparedness for pollution and related emergencies.

Collaboration with External Agencies

Table 4.14presents another area of concern. Although most companies collaborate regularly, a significant portion does not. Effective emergency management often requires coordination with regulators, community leaders, and emergency services. Weak collaboration may delay response during large-scale incidents. Njoku emphasized that inter-agency cooperation strengthens emergency response efficiency, especially in complex offshore and onshore operations [3].

Poor Management Commitment

Table 4.15, where poor management commitment is identified as the major challenge. This suggests that emergency preparedness is strongly influenced by leadership priorities. Even when funding and equipment are available, weak management support can reduce enforcement of drills, training programs, and compliance monitoring. This finding strongly supports Safety Culture Theory, which states that leadership commitment directly shapes organizational safety behavior.

Previous Incidents Exposed Weakness

The fact that 67.8% of respondents reported that previous incidents exposed weaknesses (Table 4.16) indicates that real-life emergencies have revealed operational gaps. Learning from past incidents is a key principle of risk management. According to Aven and Renn, organizations must continuously evaluate and improve safety systems based on lessons learned [11]. The data suggests that while companies have experienced weaknesses, there is an opportunity to strengthen resilience through corrective actions.

Overall Effectiveness of Emergency Preparedness

Table 4.17 shows that although overall preparedness is rated as "Good" by most respondents, a considerable percentage rate it as "Fair" or "Poor." This confirms that while the upstream sector has made progress in formalizing emergency systems, significant improvements are still required. The sector demonstrates moderate preparedness but has not yet achieved optimal readiness across all companies.

Conclusion and Recommendation

Conclusion

Based on the findings of this study, it can be concluded that emergency preparedness in Nigeria's upstream oil and gas industry is developing but not yet fully effective across all companies. The majority of upstream firms recognize the importance of emergency planning and have established formal response frameworks in compliance with regulatory requirements. This shows growing awareness of safety responsibilities and industry standards. Emergency preparedness is not only about having documented plans. True preparedness requires regular plan updates, adequate equipment, consistent training for all staff, strong leadership commitment, and effective collaboration with regulatory agencies and emergency responders. The study clearly shows that weaknesses still exist in these areas. In particular, poor management commitment and inconsistent training practices pose significant threats to effective emergency response [12-55].

The presence of experienced and qualified personnel in the industry is a strong advantage, but without continuous improvement and proactive safety culture, emergency systems may fail during real incidents. The fact that many respondents acknowledged that previous emergencies exposed weaknesses highlights the need for stronger learning mechanisms and system improvements. While the upstream oil and gas sector in Nigeria has made measurable progress in emergency preparedness, it must adopt a more proactive, comprehensive, and resilience-driven approach to ensure the safety of workers, host communities, and the environment.

Recommendation

It is in this light that this study presents a multi-level intervention strategy, which emphasizes sustaining environmental observations, training the workforce, and implementing regulations to cover emergency preparedness in the Upstream oil and gas industry:

- Management in upstream oil and gas companies must demonstrate stronger commitment to emergency preparedness. Leadership should prioritize safety in decision-making, allocate adequate funding for emergency systems, and enforce strict compliance with emergency procedures. When top management actively supports safety initiatives, it promotes a strong safety culture across the organization.
- Emergency preparedness plans should be reviewed and updated at least annually. Changes in operational processes, technology, environmental conditions, and security risks must be reflected in revised emergency procedures. Regular audits and internal assessments should be conducted to ensure plans remain relevant and effective.
- All employees, regardless of job role, should receive basic emergency preparedness training. Training should not be limited to safety officers alone. Regular drills and simulation exercises should be conducted quarterly to test response readiness. Post-drill evaluations should be used to identify weaknesses and improve future performance.
- Companies must ensure that all upstream facilities are fully equipped with functional emergency response tools, including fire suppression systems, spill containment materials, gas detection systems, and medical response kits. Equipment should be inspected regularly and maintained to ensure reliability during emergencies.
- Upstream companies should strengthen partnerships with regulatory bodies such as the Nigerian Upstream Petroleum Regulatory Commission and the National Oil Spill Detection and Response Agency, as well as local emergency services and host communities. Joint drills and coordinated emergency simulations should be encouraged to improve response speed and cooperation during large-scale incidents.
- Organizations should promote open communication about safety concerns and encourage reporting of near-miss incidents without fear of punishment. Safety awareness campaigns and leadership involvement can help build a culture where emergency preparedness is viewed as a shared responsibility.

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