



HSE GAP ANALYSIS AND ACTION PLAN STUDY

Task 4 A high level action Plan for developing Lebanon's offshore HSE governance system

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Table of contents

1	INTRODUCTION.....	3
2	PROPOSED OPTIONS FOR LEBANON.....	4
2.1	Main options choosing an offshore governance	4
2.1.1	Prescriptive vs. goal/performance based vs. hybrid system	4
2.1.2	Risk based vs. consequences based	4
2.1.3	Authority regime setup	5
2.2	Proposed option 1: risk based hybrid system	5
2.3	Proposed option 2: risk based prescriptive system	6
2.4	Preferred governance system for Lebanon	6
3	HIGH LEVEL ACTION PLAN	7
3.1	Step 1: decide on governance model	7
3.2	Step 2: institutional design	7
3.3	Step 3: Sector specific framework development	10
3.3.1	Building block 1: governance philosophy	12
3.3.2	Building block 2: Operational criteria	13
3.3.3	Building block 3: HSE Management requirements (for operators)	14
3.3.4	Building block 4: Emergency response & crisis management	18
3.3.5	Building block 5: Compliance assurance	19
3.3.6	Building block 6: continuous improvement	20
3.3.7	Building block 7: Social Engagement/Social Impact Assessment	20
3.4	Step 4: framework implementation	22
3.4.1	Prioritisation	23

1 INTRODUCTION

Over the last years the potential for offshore hydrocarbon opportunities in Lebanon has been on the increase. The Government of Lebanon has been anticipating this potential, notably by establishing the foundations for a good governance of the oil and gas sector. The "Sustainable Oil and Gas Development in Lebanon" (SODEL) which is being implemented by the United Nations Development Program (UNDP) in partnership with the Lebanese Petroleum Administration (LPA) representing the Government of Lebanon (GOL) has the objective to develop and implement an action plan for Quality, Health, Safety and Environment (QHSE) for the oil and gas sector.

As part of the SODEL project DNV GL together with ELARD has executed the following activities:

- Task 1: Review existing HSE policies, legislation and standards in Lebanon
- Task 2: Conduct stakeholder mapping for HSE management and administration
- Task 3: Conduct benchmarking for international HSE governance and management systems in the oil and gas sector and define applicable models and good practices for Lebanon
- Task 4: Develop a detailed road map of the HSE management and technical requirements needed for the different phases of the upcoming oil and gas activities
- Task 5: Conduct consultation workshop to finalize the road map

This document describes the findings of Task 4, incorporating the findings of task 1-3 and 5. As such this document presents a roadmap for Lebanon how to further develop their offshore HSE governance system step by step.

The document is structured as follows:

- Chapter 2 describes the high level governance options available to Lebanon for setting up a HSE governance system as well as the preferred option that will be elaborated on. These options have been based on the findings of the benchmark (Task 3).
- Chapter 3 present the high level action plan detailing the steps Lebanon needs to take in order to develop its HSE governance system. This chapter is based on all the findings of Task 1-3 and 5.

2 PROPOSED OPTIONS FOR LEBANON

2.1 Main options choosing an offshore governance

2.1.1 Prescriptive vs. goal/performance based vs. hybrid system

An offshore safety regime based on prescriptive regulation has the advantage of being relatively easy and simple to implement and follow up but has the weakness that it may not prevent new types of accidents that may appear in the future and it often prevents innovation due to its specific, prescriptive rules and requirements. It may also limit operators' dedication and understanding of responsibility as well as proactive initiatives to increase the safety level beyond compliance. This is particularly important in the deep water offshore arena where new technologies and techniques to improve production and safety and also reduce costs are being constantly developed, but by their nature may introduce potential new risks.

To be able to account for new types of events and to allow for needed innovation and new technology in the future, performance-based (also referred to as functional-based or goal-based) safety regimes have been introduced in several countries. In these, performance requirements and acceptance criteria are specified and industry must document that their specific solutions meet such requirements, e.g. in terms of acceptable risk levels. The advantage of performance-based regulation is that solutions for the problem at hand can be developed free of specific prescriptions. The regulation will include comprehensive safety – or HSE – cases that document how all risks (including novel risks) for the specific facility, operational conditions and location will be prevented or mitigated. A challenge of a pure performance-based regulation is that it may require more analysis and documentation to be done in each individual case to verify that performance goals are met. It also requires a competent and active regulator.

The current safety regime for the U.S. Gulf of Mexico is largely a prescriptive regulation with no requirement for safety cases to be performed. The offshore safety regimes in the UK and Norway, for example, are of the performance-based type where safety cases (UK) or detailed risk assessments (Norway) must be presented to the authorities who review and accept - rather than approve – these before implementation. Once accepted, operations not in conformance with the safety case are an offence.

A third option is to have a hybrid system based on a performance-based regulation requiring safety cases including risk assessments supplemented by required or recommended specific prescriptive regulation for selected areas.

2.1.2 Risk based vs. consequences based

In the North Sea offshore industry and the commercial nuclear power industry, a detailed risk model is established and, from this model, all hazards are identified and managed to a level commensurate with the risks. In the offshore energy industry, all risks would include at least all safety and environmental risks from topsides infrastructure, subsea arrangements and down hole. This approach has the benefit of being able to reduce risks as they become directly known and the approach therefore provide additional and higher levels of safety and environmental protection.

A consequence based approach does not take into account "likelihood" or "chance of occurrence". Prioritization is then often more based on the magnitude of the consequence leading to favoring worst case scenarios instead of more realistic events. As identified consequences are often based on historical events a consequence based approach is less favorable taking into account recent developments and/or



specific circumstances. The main advantage of a consequence based approach is that it is more standardized and less complex to administer.

2.1.3 Authority regime setup

An effective offshore safety regime must ensure that clear roles and responsibilities are established between all parties involved. In particular, the role and responsibility between authority and operator is important. The performance-based regime has been preferred by a number of authorities not least because of its very clear split of responsibilities, where authorities define performance goals and acceptance criteria and the operator has the responsibility to ensure that these performance goals are met.

In a prescriptive regime the authorities define implicitly the performance by prescriptive requirements and will furthermore typically approve the operator's plans, in some cases including detailed operations. Although the operator normally will be defined in the regulation to carry the liability for the operation, matters may become unclear if something goes wrong and the authorities have both given specific requirements for the facilities and operation plans as well as approved their implementation. Also, the responsibilities between parties may also vary between different pieces of the regulation. The choice of the performance based model is therefore natural when authorities want to minimize own risk and liability.

2.2 Proposed option 1: risk based hybrid system

Having reviewed the benchmark findings as well as based on our experience DNV GL preferred solution for the Lebanese situation is to implement a risk based hybrid governance system. This means a goal based/performance based system supplemented by required or recommended specific prescriptive regulation for selected areas very much in line with the Irish system.

The main advantages of such a system are:

- A goal based system is flexible and in general can incorporate changes of insight rather quickly ensuring best practice operations
- A risk based system ensures that focus is on specific risks associated with a specific installation
- Developing a goal based system is a relative simple process as focus is on output and less on content.
- Minimizes the authorities own risk and liability as it's up to the operator to show evidence of good practices.

The main challenges of such a system are:

- A goal based system requires a lot more competence from the authorities as monitoring and control becomes a customized exercise requiring a lot of knowledge and expertise.
 - By prescribing selected area's this challenge can be somewhat reduced.
 - Another alternative is to appoint external competent bodies (e.g. like international service providers) to do certain parts of the job (e.g. auditing, verification, review).

- A goal based system often includes subjective elements. E.g. the concept of ALARP is powerful but can never be objectively defined: what is practical to one party might be impractical for the other.

2.3 Proposed option 2: risk based prescriptive system

As a second option DNV GL proposed a risk based prescriptive system. This system is characterized by detailed requirements and application of risk concepts (e.g. QRA, HAZOP, barrier management)

The main advantages of such a system are:

- A prescriptive system requires less competence from the authorities as monitoring and control becomes more of a check box exercise
- A prescriptive system is more transparent: the prescriptions are clear and everybody knows what to expect
- A risk based system ensures that focus is on specific risks associated with a specific installation although the prescriptive nature of the governance system makes it less flexible to incorporate specific circumstances.

The main challenges of such a system are:

- A prescriptive system is more rigid with the risk of focusing on less relevant issues, not incorporating new insights, developments and technologies.
- Developing a prescriptive system takes a lot of time and a lot of expertise.
- Liability of authority might be compromised: if an operator has followed the prescriptions to the letter but the prescriptions turn out to be wrong, the authority might be at fault.

2.4 Preferred governance system for Lebanon

Based on the above and following internal discussions by the LPA it has been decided to further develop an action plan for option1: a risk based hybrid system based on the following main arguments:

- Current Lebanese regulations already contain several goal based/performance based notions (see also table 8.1 last column)
- A hybrid system forms a good balance between performance based and prescriptive
- A prescriptive system would take too much time to develop
- A hybrid system is preferable when it comes to liability
- Competence and resource challenge can be (partly) solved by using external (independent) bodies.

Chapter 3 presents a high level action plan indicating what is needed to implement a risk based hybrid governance system in Lebanon.

3 HIGH LEVEL ACTION PLAN

The following high level action plan is proposed:

- Step 1: decide on governance model
- Step 2: institutional design
- Step 3: sector specific framework development
- Step 4: framework implementation

Each step is elaborated below.

3.1 Step 1: decide on governance model

As indicated in paragraph 3.4 a risk based hybrid system is preferred but still requires approval. During the stakeholder workshop performed as part of this study (Task 5) there seemed to be a unanimous agreement on choosing a hybrid risk based system. Based on this assessment, the stakeholder workshop legitimisation the next step is to develop a governance philosophy document as described under Step 4, building block 1 below.

3.2 Step 2: institutional design

The next step is to (further) develop/align the institutional design: who will be responsible for what? Based on international best practices a number of ground rules can be identified that should be taken into account:

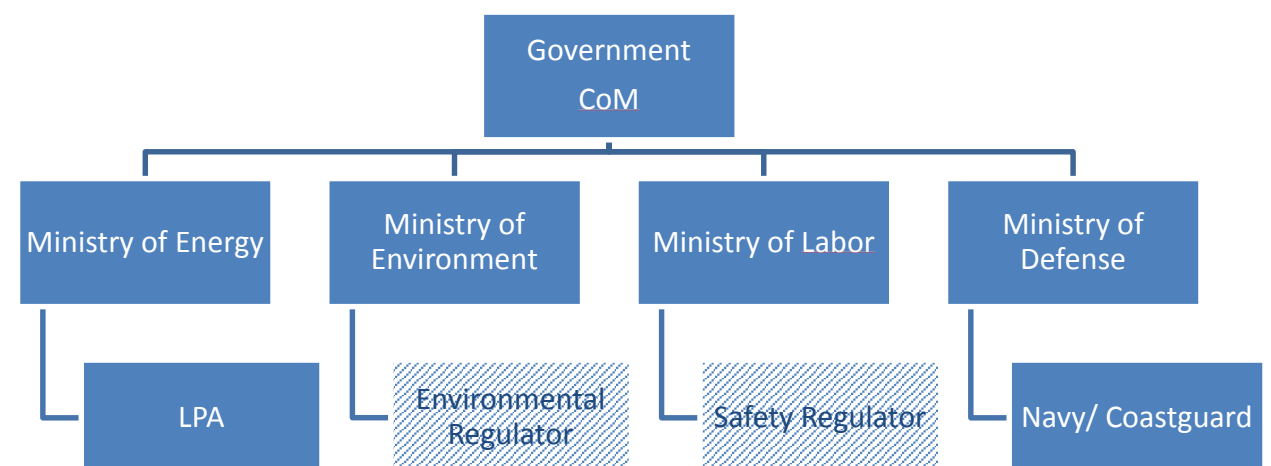
- The safety (and environmental) regulator (issuing safety and environmental permits) should be independent from the authority issuing the production licenses to prevent conflict of interest.
- Responsibilities are clearly defined and designated to prevent conflict of interest situations.
 - Responsibilities are not shared but are clearly designated to one party. This does not mean that the execution of responsibilities is also done by one party. Through Memorandums of Understanding certain responsibilities can be delegated (= accountable) but then still one party remains the main responsible.

From Task 1 and 2 of this project the following findings can be adopted related to the current institutional set up related to offshore activities:

- The CoM upon recommendation from the Minister of Energy is responsible for issuing licenses. The LPA (under the Ministry of Energy) is responsible for managing, monitoring and supervising Petroleum Activities.
 - Based on the above this means that the Ministry of Energy and its subsidiaries should not be directly involved as HSE regulator as this would introduce a conflict of interest.
- The current law stipulates that both the Minister of Energy and the Minister of Labor have responsibilities in the area of safety. Based on the benchmark findings only one authority should have the main responsibility, in other words this should not be shared or a clear distinction in scope should be achieved.

- the Ministry of Labor is the authority responsible for safety and occupational health at the work place; the role of the MoL is however not explicitly recognized in the OPRL Law and in the PAR;
 - several articles in the OPRL and PAR give authority to the Minister of Energy to review and approve operators plans that include safety information; it is however not clear that another authority would be consulted for this approval (like MoL) while it is clear that the opinion of the Minister of Environment is to be sought for environmental matters.
 - It does not stipulate who sets the requirements (does not have to be MoE) and who does actual monitoring of the requirements (as review and approval is not the same thing as monitoring and responsibility does not automatically mean the authority will also do the execution (as this can be delegated)).
 - Coordination between the Ministers of Energy and Water and Labor is important to ensure effective coordination in the regulation and enforcement of Health and Safety issues for offshore oil and gas activities (e.g. related to related to inspection, monitoring)
 - While process safety regulation seems to be delegated exclusively to the Minister of Energy and Water with the support of the LPA, responsibilities for occupational safety and occupational health are distributed between both ministries
 - In general, for all OH matters, clear distinction of responsibilities should be made between MoEW/PA and MoL to avoid duplication of work; OPRL/PAR seem to transfer OH responsibilities to MoEW/PAR for the offshore sector;
- the Ministry of Environment is the authority responsible for the protection of the environment in all the Lebanese territory and waters; the role of the MoE is explicitly recognized in the OPRL and in the PAR; Article 60 of the Petroleum Law explicitly states “The Ministry of Environment, in coordination with the Minister of Energy, shall be in charge of supervising and controlling environmental matters related to Petroleum Activities and shall coordinate with other concerned authorities, take initiatives or measures deemed necessary to minimize negative impact that Petroleum Activities may have on local communities and the environment”; this is in Line with the responsibilities set for the MoE in Law 444 (Protection of the Environment) and its organization Law 690
 - Coordination between Ministers of Energy and Water and Environment is essential to ensure an effective EIA process for oil and gas activities in offshore Lebanon.

The above results in the following draft institutional design, the hatched elements do currently not exist and could also be organized differently:



The Petroleum Administration is responsible to: • Promoting the industry • Prepare the invitations to bid, the specifications, the relevant permits and the agreements. • Support in the negotiation of the terms with the companies to support in final decision making at the Council of Ministers. • Manage, follow up, supervise, and monitor all petroleum activities, • Evaluate plans for field development, petroleum transportation, decommissioning, and removal of facilities. • Manage the data associated with the petroleum activities. • Handle and manage the petroleum register.	The ER should be responsible for: • Environmental Framework development and maintenance • Environmental Permitting and approvals • Monitoring and inspections • Environmental Accident investigations • Reporting	The SR should be responsible for: • Safety Framework development and maintenance • Safety permitting and approvals • Monitoring and inspection • Safety & Occupational Health Accident investigations • Reporting	Coastguard responsible for • Emergency preparedness and coordination • Monitoring and inspection • Reporting
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Figure 3-1: draft Lebanese Petroleum Governance Organisation

Apart from the above the following government entities are likely to have a role to play:

- LIBNOR: development/assessment/approval of standards and guidelines;
- LAEC: authority responsible for management of radiological materials and NORM wastes;

- MoPH: protection of public health including occupational health (MoUs with MoPH will be required to define supporting role);
- MoPW: approvals related to the use of the maritime domain and control of vessels including their environmental impacts. Monitoring of emergency response operations;
- MoD/Navy: responsible to lead emergency response operations;
- Environmental prosecutor: responsible to lead court cases related to environmental violations;

As such the following recommendations remain:

- Ensure the establishment of an independent safety and environmental regulator;

As indicated the current situation does not guarantee independence of the HSE regulator functions. At the same time it is acknowledged that enabling a fully independent (e.g. separate) HSE regulator is not feasible in the short run.

DNV GL strongly believes however an independent HSE regulator should have been established when exploration drilling commences, as during these activities already critical risks that potentially carry large consequences can occur. In the meantime it is advised to already implement the measures suggested below as they will improve the current situation.

- Create awareness among stakeholders about the possible conflict of interest, e.g. create an LPA policy statement signed by all the LPA board members where the risk of conflict of interest is acknowledged and where the organization commits itself to prevent conflict of interest situations as best as possible, e.g. by incorporating the measures below.
- Avoid any situation that could be perceived as conflict of interest: e.g. HSE functions do not take part, other than their function entitles, in commercial licensing processes and vice versa: commercial functions do not take part in HSE matters. Consultation vice versa is allowed.
- HSE policies are developed without direct involvement of commercial roles (other than through formal review rounds). Internal HSE stage gates are defined that need to be satisfactory passed, e.g. proper risk assessment performed, second and third party reviews conducted.
- Apply the concept of third party review/verification: e.g. use reputable independent third party organizations to review/ verify critical HSE aspects, e.g. policy plans, operator plans, risk assessments, etc.
- Start the process of developing an independent HSE regulator and provide regular updates about progress, e.g. to the Council of Ministers.
- Ensure clear distinction of responsibilities;
- Clarify role of MoL e.g. through a memorandum of Understanding or a Ministerial Decision as based on the current legal requirements her role in relation to the LPA is not clear.

3.3 Step 3: Sector specific framework development

Based on the institutional design the legal/regulatory system might need alignment to ensure that the parties are authorized to act on behalf of their responsibilities. In task 1 an assessment has been carried out identifying the current available HSE legislation in Lebanon and assessing its applicability and



suitability for offshore activities. Next to the responsibility issues raised in the previous paragraph the following statements can be made:

- The majority of Lebanese regulations have not been developed with offshore oil and gas activities in mind. Although in most cases they will be applicable their suitability varies. Most regulations relate either to land based activities or maritime activities. Offshore activities are generally not included under maritime regulations. On the environmental side an offshore suitable regime needs to be further developed.
- The OPRL and PAR have been developed recently specifically for the offshore sector.
- Related to the OPRL the following can be stated:
 - In general the OPRL provides the basic requirements (e.g. provide a Health and Safety Plan) but it does not provide acceptability criteria.
 - The OPRL does not refer/does not offer the opportunity to link to underlying guidance documents and/or standards
- Related to the PAR the following can be stated:
 - The PAR introduces several notions that can easily be incorporated into a hybrid risk based regime (e.g. risk management concept, barrier management); however the PAR does not provide a lot of guidance how to apply these concepts and does not provide acceptability criteria. This guidance does not have to be given in the PAR but guidance notes should be legally linked to the PAR or vice versa;
 - The PAR is missing a common concept for HSE governance, e.g. adoption of ALARP concept, a safety/HSE case regime resulting in a patchwork of concepts and requirements;
 - The PAR currently does not facility the use of independent third parties (e.g. for inspection, verification and/or review);
 - The PAR currently does not allow the applications of international standards.
- It's not clear from the OPRL and PAR which institutions are authorized to develop/update guidelines/frameworks/standards and the process to make them legally applicable
- The clarification of responsibilities (Step 2) will require legal updates.

To ensure the gaps above are closed the development of a number of building blocks is suggested. The building blocks together with the PAR and OPRL will then form the sector specific HSE framework that provides the legal basis as well as the guidelines and restrictions related to offshore activities. The framework needs to be made legally applicable for which several options exist:

- Implement as a decree;
- Enforce through ministerial decisions;
- Publish as guidance/standard document and ensure legal applicability through referral in the current OPRL and or PAR.

It should be noted that this framework will be a working document requiring continuous updating to incorporate lessons learned, new developments and insights and as such the legal positioning should be chosen in such a way that this can be facilitated.

3.3.1 Building block 1: governance philosophy

This block will describe the overall governance philosophy on which the governance system is built. This block will result in a kind of policy statement that sets the base philosophy, principles and expectations along which the HSE governance system will be developed. As such it will also become a reference document that will provide guidance during future updates and policy decisions. Based on the above this document should include the following aspects:

- Scope/application area
- Self-regulation concept leading to goal based requirements
 - Requirements are for the majority goal based meaning they will describe the desired outcome rather than the way to get there.
 - This gives flexibility to the operator to use (best practice) techniques and methodologies he is used to.
- Risk based:
 - The governance system will be based on the principle of risk management (as opposed to a consequence based system). This means HSE governance is based on the identification, assessments and mitigation of specific risks associated with a specific installation.
 - Operators will have to show that they are in control of their operations by fully identifying, assessing, mitigating and monitoring all HSE risks and general risk level is in line with the set risk criteria. The concept of risk management gives the operator flexibility in applying their preferred solutions and ensures focus is prioritized on those risks that are most significant.
 - Risk criteria could be quantitative (e.g. individual risk should be smaller than 10⁻⁶ per year) or qualitative such as ALARA (As Low As reasonably Achievable) or ALARP (As Low As Reasonably practical).
- Prescriptive elements:
 - For certain elements it can be justified to put more detailed requirements in place because these elements are (SHE) critical, not well suited for a goal based approach or the authority prefers a more tight control.
- Approval roles and responsibilities:
 - Defining the various roles, (shared) responsibilities and general expectations. How are the various stakeholders working together to achieve the desired end result: safe, sustainable and reliable operations yielding value for both operators as well as Lebanon.

This element also defines the various approvals that have to be sought by the operator such as a) approval of HSE case/plans/management system b) approval of independent review body c) approval of independent verification body. This also links with building block 3: compliance assurance.

- This should be brought in line with the distribution of responsibilities as step 2 of this action plan.
- As indicated the role of independent (verification/review) bodies is currently not available. Adopting this concept will require:
 - Making it legally possible;

- Develop an accreditation scheme (inc. accreditation criteria such as competence, independence, liquidity);
- Define application area's (e.g. verification, review, which installation/components/phases)
- Develop the procedures governing the use of independent bodies (e.g. ref. Irish Compliance Assurance system, [chapter 2 and 4](#)).

3.3.2 Building block 2: Operational criteria

This block intends to develop the applicable concepts and acceptance criteria in the field of HSE governance that operators will have to comply with.

- **Risk analyses, risk management and risk acceptance criteria** related to HSE (**P**). Following the adoption of a risk based regime, this part should describe the risk tools, techniques and criteria to be applied. Especially related to the risk criteria prescribing are preferred to create a level playing field and ensure a common comparison platform.
 - From the previous tasks it was concluded that the current OPRL and PAR (e.g. article 130) provide limited to no guidance on how to apply the risk management concepts (e.g. which tools to use: HAZID, HAZOP, QRA,..) and evaluation criteria are missing.
 - It is recommended to elaborate on the risk management concept by developing guidelines prescribing the allowable tools (e.g. HAZID, HAZOP, QRA, JSA), application areas, etc. (e.g. such as this UK HSE [manual](#))
 - Change the current PAR requirement where operators can set their own acceptance criteria
- **Barrier management (P)**: Barrier management refers to a design philosophy to ensure no single point of failure can directly lead to a catastrophic event. This element should describe the main philosophy to be applied by the operator as well as can contain prescriptive criteria for assessing the effectiveness of individual barriers.
 - The PAR already introduces the notion of barrier management but specifically in relation to well management: Article 89 states that two independent and sufficiently tested barriers are in place to prevent accidental flow. Additionally there is a requirement for updating a barrier plan; the operator defines operational requirements to comply with the barrier plan; well control equipment shall be periodically tested and examined to verify barrier functions
 - It is recommended to apply the concept of barrier management in a much broader setting, i.e. as a basis for installation design as well as a basis for emergency preparedness. I.e. for all the HSE risks identified by the operator, he needs to show that mitigation measures are compliant with the barrier management principle.
- **Environmental permit system(s) and criteria**: the current environmental permit system is ill suited for specific offshore operations. As such it is recommended to develop of (a) permit system(s) related to environmental discharges and emissions and development/adoption of environmental acceptance criteria. This could be an integrated Environmental Permit system covering all relevant area's such as:
 - Emissions (fugitive, GHG, flares & venting, ..)

- Waste waters (produced water, deck drainage)
- Waste streams (drill cuttings, produced sands)

It is recommended that for every offshore phase a new permit needs to be issued as the characteristics vary per phase but as this can also work as an incentive to the operator to be compliant. For some area's international standards or conventions exist that can/should be adopted. For the majority

3.3.3 Building block 3: HSE Management requirements (for operators)

This block will describe all the HSE requirements that the operator will have to comply with. Compliance have to be shown by submitting analysis reports, study reports and evidence and these documents will form the basis to provide the HSE permit.

The elements that carry a **(P)** are candidates for a more prescriptive approach based on their importance within the governance system. Some elements are also classified as *nice to have*: putting in place requirements here will make the governance system more mature but having requirements in place is not seen as vital or critical.

- Management system requirements
 - **Operator's HSE policy:** to ensure the operator/consortium has a HSE policy in place. Requirements can be defined such as: the HSE policy is based on continuous improvement approach, international best practices or other. When dealing with reputable companies (such as the pre-qualified companies in Lebanon) this element is not a relevant as others and is regarded as *nice to have*.
 - **Management system:** it's international practice to require an operator to have a comprehensive management system in place.
 - PAR Article 9. Already requires the operator to have a management system: The Right Holder shall ensure that the Operator implements and the Operator shall establish and maintain a management system which:
 - a) Ensures the systematic management and implementation of all of the Operator's activities;
 - b) Contributes towards the continuous effort in improving conduct and results of Petroleum Activities; and
 - c) Provides for comprehensive and coordinated commercial, operational and regulatory supervision of the Petroleum Activities.

The management system shall, inter alia, include the following elements:

 - a) Description of the objectives of the Petroleum Activities;
 - b) Overview of the relevant rules and regulations that are applicable and a description of the mechanisms for keeping the information updated with regard to amendments or new regulatory requirements;
 - c) Specific requirements applicable in respect of safety, working environment, protection of the environment, and resource management that comprise the basis for planning, implementation and updating projects, operations and other Petroleum Activities;

- d) Organization of the planned activities, including a description of the allocation of duties, responsibilities and authority, the distribution of units and personnel, and the modes of communication;
 - e) Description of qualifications required from personnel, personnel shortages and the plans to mitigate such shortages, including the relevant qualifications required from personnel to fill identified gaps;
 - f) Guidebook of procedures, instructions, or other routines describing the planning and implementation of activities in order to achieve the proposed objectives;
 - g) Procedures or instructions manual describing the handling of situations or incidents in breach of, or deviation from, regulatory or company instituted norms, standards, procedures or other requirements; and
 - h) Plans for updating and further development of the management system.
- The above is deemed satisfactory
- **Operator's (HSE) organisation inc. description of (main) responsibilities.** To make sure the operator/consortium has clear responsibilities defined. Requirements can be defined such as key contacts points for HSE, emergency situations, responsibility for contractors, etc.
 - In addition to the more general requirement to describe the organisation above, this element specifically focusses on the HSE organisation;
 - Currently there is no clear requirement for providing this information.
 - **Risk analyses, risk management and acceptance criteria (P).** This part should clarify, explain how to apply the operational criteria (and associated tools) described under building block 2.
 - **Barrier management (P):** This part should clarify, explain how to apply the barrier management philosophy, tools and criteria developed under building block 2.
 - **Competence and training.** For HSE critical roles it might be valuable to put competence requirements in place that require the operator to show employees are well experienced and trained. When dealing with reputable companies this element is not regarded as relevant as others as companies already have mature competence schemes in place and for their own reasons (e.g. reputation) have an incentive to employ competent people. As such this element is regarded as *nice to have*.
 - **Monitoring of performance (P):** to enable industry learning but also facilitate monitoring the submittal of performance data is a vital part of an offshore governance system. To make sure data is of good quality and comparable this element is likely to be more prescriptive detailing the type of data, format of data and recurrence of submittal.
 - The PAR Article 133 currently states that a report on incidents shall be submitted to the PA
 - It is recommended however to also request performance data on a regular basis. A distinction can be made between leading performance indicators (from active monitoring of risk reduction measures to ensure their continued effectiveness) and lagging performance indicators related to incidents. As an example [paragraph 3.1](#) of the Irish Compliance Assurance system present a comprehensive table of indicators.

- This data should also be send to the HSE regulators.
- **Emergency preparedness (by the operator):** emergency preparedness is also a vital part of the management system to make sure consequences are minimised in case of an emergency. Where this element describes the crisis organisation the emergency preparedness element (below) describes the activities an operator undertakes before an emergency presents itself. Although requirements can be goal based (operator needs to show how to deal in case of an emergency) some prescribing might be needed.
 - The PAR is already quite specific about the requirements for emergency preparedness:
 - Article 137. Emergency Preparedness: The Operator shall be prepared to handle accidents and emergencies (...). The Operator (...) shall take the necessary measures to prevent or minimize harmful effects of accidents and to restore the environment in accordance with an emergency response plan which shall identify the potential accident events and consequences of such events. The Operator shall cooperate with other Right Holders and Operators on the elaboration of the emergency response plans. The Minister may under specified circumstances, issue orders and stipulate conditions for such cooperation, including the participation of Right Holders in the financing of the emergency response arrangement. In case of emergency, the Minister may propose intergovernmental coordination of emergency response measures. In the event of accidents or emergencies, the Minister may coordinate the measures proposed in the emergency response plan and may: a) Order other entities to provide emergency related Facilities, resources and equipment; and b) Undertake other measures to obtain the necessary additional resources through other means.
 - Article 138. Emergency Response Plan: The Operator shall submit (...) an emergency response plan for handling accidents and hazardous situations which may occur during Petroleum Activities and such plan shall, among other items, contain the following information:
 - a) An organizational chart with a precise description of responsibilities, channels of reporting information, and duties of each individual in the event of accidents and dangerous situations;
 - b) A list of the equipment intended for use in each accident or in each danger situation with a precise description of the nature and type of equipment, its capacity, location, means of transport, usage and corresponding area of use; and
 - c) A programme of action with a precise description of the alarm and communication systems, including means of communication with authorities, of the duties of private parties, of when and on which terms emergency equipment is to be used, of how the operations shall be performed, of the measures for limiting the extent of the damage in case of accident or hazard, and the procedures for winding up the operation. The plan shall be updated, compatible with national emergency response systems and submitted to the Petroleum Administration and to other relevant authorities and entities. The Petroleum Administration must be notified prior to the carrying out of emergency exercises and must receive a report on such emergency exercises.
 - Article 139. Emergency Equipment: The Petroleum Administration may require the installation of emergency equipment such as firefighting equipment, oil barriers, vehicles, standby boats or aircraft's, near or at the Facilities or at major equipment involved in Petroleum Activities and stipulate the operational requirements of each of such equipment under these circumstances.

- In addition it is recommended to consider the following aspects:
 - Identify relevant accident/response scenario's based on HSE risk assessment and apply the barrier management concept in the response strategy, e.g. ensure multiple responsive barriers are in place;
 - Requirements related to demonstrating the readiness and efficiency of the emergency response (e.g. drills, exercises)
 - Identification/demonstration of the relevant operating procedures;
 - Requirements to have a safe refuge on board the installation;
 - Requirements related to the number of life boats and personal protective equipment;
 - Requirements for back up equipment (communication lines, power supply,..);
 - Requirements related to number of escape routes;
- **Reporting and notifications to the authorities (P):** this element indicates the various documents, data and other information is to be submitted to the authorities and when. Apart from HSE plans and permit requests this is likely to include, performance data, incident/accident data, large changes to the system (i.e. organisational, technical).
 - The OPRL and PAR contain several requirements where information has to be presented to the authorities. This action plan will add more requirements. To ensure a transparent overview it is recommended to develop a specific reporting document that summarizes
 - the various reporting requirements;
 - to whom they should be directed;
 - when they should be reported;
 - In which format:
 - What should be covered in each reporting;
 - What the function of the reporting is and how it will be used.
 - Currently the OPRL/PAR do not seem to have a requirement to notify the authorities in the case of significant changes (either in the process, as compared to the plan,...)
- **Adoption of international best practices:** although there are some references in the OPRL and PAR of applying international best practices this is not further elaborated upon.
 - It is recommended to elaborate on the concept of international best practice for example by referring to international organisations like ISO, International Regulators Forum Global Offshore Safety, OGP, IADC
 - Adopt/internalize/refer to international standards ([link](#)) as they provide a quick way of adopting best practice approaches as well as performance levels.
- HSE plan/document/case requirements describing what should be covered in such a plan. Currently PAR article 129 requires a Health and Safety Plan to be developed and maintained by the operator but does not give any guidance what such a plan should cover (such as for example the [Irish safety Case guidelines](#) or the [UK safety case guidelines](#)).

- As such it is recommended to develop detailed document requirements taking into account the various phases:

- Exploration: describing site assessment, type of equipment applied impact to the environment, HSE risk identified and how they will be mitigated.
- Drilling : describing type of equipment applied, associated risks and mitigation measures and specifically detailing:
 - Well design requirements
 - Well barrier requirements
 - Riser margin requirements
 - Casing and cementing activities requirements
 - Well testing requirements
 - Well abandonment requirements

For all of the above adoption of international standards as best practice is recommended

- Production: describing all production activities, associated HSE risks and mitigating measures
- Decommissioning/well abandonment: describing risk associated with the decommissioning activities as well as after well abandonment. Although eventually decommissioning will take place and requirements will have to be put in place, at this stage this elements is *nice to have*.

3.3.4 Building block 4: Emergency response & crisis management

This block is focused on emergency response and crisis management from the perspective of the authorities. Emergency preparedness and Response has been given high priority and frameworks have been developed; Additionally UNDP, in coordination with LPA through the SODEL project, will develop a National Oil Spill Contingency and Response Plan for Lebanon; the Disaster Risk Reduction Project has set the foundations for emergency preparedness and response and can support the MoE and relevant authorities to operationalize its capacity to prepare and respond to environmental emergencies linked to the oil and gas sector (such as oil and chemical spills).

In line with the risk based approach it is recommended to also apply a risk based approach related to emergency response and crisis management: operators are required to prepare a strategy for emergency preparedness against situations of hazard and accident (risk scenarios). The emergency preparedness shall be established on the basis of results from a set of defined analysis with regards to safety and environment. The design of the National Oil contingency and the response capacity are linked to these operator emergency preparedness plans are based on environmental risk analyses for acute pollution. The oil spill environmental risk is then dependent on the actual installations and their activity and on the sensitivity of the possible influenced environment.

As indicated application of the barrier management principle is recommended: the emergency plans as well as the governmental oil contingency plan are based on having several barriers in place that have the objective to minimize the consequences when an accident occurs and/or to have several layers in place before the consequences reach the Lebanese shore.



The oil spill combating equipment that is included in the emergency preparedness analysis and based on the outcome of the risk scenarios shall have been tested under realistic conditions with regard to functional and operative qualities and collection efficiency.

As a minimum the national Oil Contingency plan should cover:

- The provision of an efficient and effective marine pollution and salvage notification, monitoring and response system;
- The establishment and maintenance of a National Contingency Plan for marine pollution, preparedness and response, (partly) based on the operator emergency response plans;
- The approval and oversight roles;
- The process for direct response at sea during an incident
- The oversight of response measures on the shoreline
- The procurement and maintenance of the combating equipment

3.3.5 Building block 5: Compliance assurance

This block will describe how compliance is assured both by the operator as well as by the authorities

- Role of Independent Verification (Bodies): most installations offshore are subject to verification to ensure they are of good design, in good working condition and fit for purpose. This can be done by the regulator but very often external independent verification bodies are used. This element describes the criteria for approval of an independent verification body, when verification is needed and the process of verification.
 - As indicated the role of independent (verification/review) bodies is currently not available. Adopting this concept will require:
 - Making it legally possible (ref. step 2 of this action plan);
 - Develop an accreditation scheme (inc. accreditation criteria such as competence, independence, liquidity);
 - Define application area's (e.g. verification, review, which installation/components/phases)
 - Develop the procedures governing the use of independent bodies (e.g. ref. Irish Compliance Assurance system, [chapter 2 and 4](#)).
- Internal and external audits: as part of the governance systems audits are vital to check the performance of the system. Both internal (by the operator) as well as external (by the regulator or independent body) are common. Audit regime can be risk based (the higher the risk the higher the audit frequency), performance based (good performance results in less audits) or according to a fixed schedule. Audits can be announced as well as unannounced and should cover eventually cover all aspects of the HSE governance system
 - PAR Article 144 currently states on inspections: The representatives of the relevant Government entities shall, audit all assets, records and Data kept by the Operator or the Right Holder following a prior notice given to the Operator or the Right Holder within a reasonable time limit; The relevant Government entities may post duly appointed representatives on site on a permanent basis at metering stations.

- In line with the discussions in step 2 it should be clear which entity will be responsible for performing inspections
- Independent review (bodies): in the case of Lebanon, where offshore competence is scarce, it can be beneficial to adopt the role of independent review bodies. Interdependent review bodies are external organisations that are approved by the Lebanon Authority to act on their behalf, e.g. by reviewing the HSE cases/plans that have to be submitted.
 - See also comments made under independent verification body.
- Monitoring and inspection requirements: defining when, what, by whom will be inspected
- Approval roles and responsibilities: defining the various roles, (shared) responsibilities and general expectations.
 - This should be brought in line with the distribution of responsibilities as step 2 of this action plan.

3.3.6 Building block 6: continuous improvement

This block describes how continuous improvement is achieved both by the operator as well as the authorities. Although a good governance system enables continuous improvement this block is not regarded critical in governing the offshore industry and as such is classified as *nice to have*.

- Learning from incidents: describing the process to learn from incidents, share information across the industry with the objective to enhance the overall performance of the industry
- Knowledge transfer: e.g. how to make sure offshore competence is transferred to Lebanon.
- Learning from audits and inspections
- Consultation of stakeholders/operators (see also building block 7)

3.3.7 Building block 7: Social Engagement/Social Impact Assessment

This building block runs parallel with all the other building block and has the objective to ensure informing/consulting with relevant stakeholders. Distinction can be made between dedicated and non-dedicated stakeholders and critical and non-critical stakeholders.

Stakeholders are defined critical if they meet any of the following criteria;

- They are in a position where they can influence decision-making either positive or negative;
- They are in a position where they can enrich decision making (e.g. expertise, resources (financial, human resource));

A non-critical stakeholder can still bring value but from a decision making point they are not regarded a potential showstopper. Based on the stakeholder assessment done in task 2 the following statements can be made:

Stakeholder	Characterization	Recommendations
Council of Ministers (COM)	Critical	High frequency consultation and informing throughout all steps of the roadmap

Ministry of Energy and Water (MoEW)	Critical	High frequency consultation and informing throughout all steps of the roadmap
Committee for field emergencies for energy and water	Non critical	Low frequency consultation/informing (e.g. 1/year during general stakeholder conference)
Lebanese Petroleum Administration (LPA)	Critical	-
Ministry of Environment (MoE)	Critical	High frequency consultation and informing throughout all steps of the roadmap
National Emergency Response Committee (NERC)	Critical	High frequency consultation and informing in relation to ER
National Council for Environment	Non critical	Low frequency consultation/informing (e.g. 1/year during general stakeholder conference)
Ministry of Labor (MoL)	Critical	High frequency consultation and informing in relation to Occupational Health issues
Ministry of Public Health (MoPH)	Non critical	Low frequency consultation/informing (e.g. 1/year during general stakeholder conference)
Ministry of Public Works and Transport (MoPWT)	Critical	High frequency consultation and informing throughout all steps of the roadmap
Ministry of Industry (MoInd)	Critical	Medium frequency consultation and informing (as the offshore industry primarily falls under responsibility of LPA)
Ministry of Interior and Municipalities	Non critical	Low frequency consultation/informing (e.g. 1/year during general stakeholder conference)
Ministry of Defense (Lebanese Customs, Lebanese Navy,) (MoD)	Critical	High frequency consultation and informing in relation to ER
The Lebanese Standards Institution – Libnor	Non critical	Low frequency consultation/informing (e.g. 1/year during general stakeholder conference) and in relation to standards developments
Disaster Risk Reduction (DRR) (within the Council of Ministers)	Critical	High frequency consultation and informing in relation to ER
Lebanese Atomic Energy Commission – LAEC)	Non critical	Low frequency consultation/informing (e.g. 1/year during general stakeholder conference) and in relation to radioactive waste issues
CBRN National Team	Critical	High frequency consultation and informing in relation to ER

General public	Non critical	General information campaign and e.g. annual hearing sessions
Pre-qualified operators	Non critical	Low frequency consultation/informing (e.g. 1/year during general operator conference). Also possibility to have operators review newly developed HSE policies and provide feedback

It could be decided to run a Social Impact Assessment although this is not a legal requirement and is also not a common exercise around the world (especially also because offshore activities are performed for the majority "out of sight"). In 2015 the SIA hub for Social Impact Assessment practitioners published their guidelines ([link](#)) on how to run a SIA.

3.4 Step 4: framework implementation

Once a framework has been developed, it needs to be implemented. As offshore developments will also gradually develop, the implementation can be done in line with the development of the industry.

The current situation in Lebanon is:

- There are 2 specific Decrees that have to be endorsed by the Council of Ministers before exploration and production rights are awarded: (1) EPA and Tender Protocol and (2) Blocks Delineation decrees. Estimations vary on when these pending decrees will be signed.

Pre-qualification:

- A pre-qualification of companies has taken place resulting in 12 qualified Rightholders and 34 non-Rightholders.

Bidding Round:

- As soon as the above mentioned decrees have been signed, a bidding round can be completed, whereby an unincorporated joint venture among a minimum of 3 Right Holders with at least one prequalified as Rightholders can be awarded petroleum rights in the offshore blocks. The EPA's should be signed within a maximum of 10 months after signing the 2 pending Decrees.

Exploration Phase:

- The first working phase, the "Exploration Phase", will commence once the EPA's have been signed.
- This phase can take up to 6 years divided into 2 periods: 1st exploration period of 3 years - 2nd exploration periods of 2 years and a possibility to extend the 2nd exploration period by 1 year can be provided (in case a discovery is made).
- The Rightholders are required to submit an Exploration Plan to the LPA (for every exploration period).
- The entire Exploration Phase can be extended up to 4 more years based on a Council of Minister's decision as per the OPRL (again only in case a discovery is made).
- Upon finding a discovery in the exploration phase, the Rightholders notify the LPA and submit an "Appraisal Plan" and proceed to conduct "Appraisal Activities" once the Minister approves the Appraisal Plan.
- The Rightholders then are requested to deliver a "Declaration of Commerciality" (DoC) to the Minister 60 days after completion of Appraisal Activities.

- Following the Declaration of Commerciality, the Rightholders then submit a Plan for Development & Production (PDP):
 - If the discovery is a “Natural Gas Discovery” the Rightholders must submit a “Gas Infrastructure and Marketing Plan” (GIMP) along with the PDP. The Rightholders may have an extension of up to 3 years to submit the GIMP.
 - If the Discovery is a “Crude Oil Discovery” then the Rightholders have a maximum of 180 days after Doc to submit the PDP.
- The PDP is approved by the Council of Ministers following the proposal of the Minister based on the recommendations of the LPA.

Production Phase:

- The phase that follows is the “Production Phase” which starts after the completed PDP has been approved by the Council of Ministers:
 - If the 1st commercial discovery is “Natural Gas Discovery”, then the Production Phase commences when the CoM approves the PDP and GIMP.
- Rightholders submit an application for a “Production Permit” to the Minister and LPA no later than 8 weeks prior to planned commencement of Petroleum Production.
- The Production Phase can last up to 25 years after the approval of the PDP and the GIMP.
 - The Production Phase can be extended for 5 more years if required.

Decommissioning:

- Time to decommissioning depends on the field size but is normally several decades.

This means that the first exploration activities can be expected a year from now soonest but this can easily become two to three years or more.

Production drilling will not start for another two years in the most optimal case but also here it can easily take longer especially because operators also have their own schedule when developing fields.

3.4.1 Prioritisation

As indicated above the first phase will be exploration drilling. For this phase the following items should be ready:

- Action Plan, Step 1 – 2
- Action plan Step 3, specifically the following elements
 - Operational criteria and permit systems
 - Risk analyses, risk management and acceptance criteria
 - Barrier management
 - Environmental permitting and acceptance criteria
 - Management system requirements

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- Risk analyses, risk management and acceptance criteria (translation to operator requirements)
 - Barrier management (translation to operator requirements)
 - Emergency preparedness (by the operator)
 - HSE plan/document/case requirements
 - Exploration phase
 - Emergency response & crisis management
 - Compliance assurance
 - Monitoring and inspection
 - Approval roles and responsibilities

For the production phase all elements should have been developed taking into account “nice to have” qualifications.



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