



**Template for the review of the draft standards and guidelines
associated with the draft regulations on exploitation of mineral resources in the Area**

TEMPLATE FOR COMMENTS

<i>Document reviewed</i>	
Title of the draft being reviewed:	Draft Guidelines on tools and techniques for hazard identification and risk assessments
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<i>General Comments</i>	
Purpose of the Guideline	
<p>A hazard is usually defined as something like: any source of potential damage, harm or adverse health effects on something or someone; or something that is dangerous and likely to cause damage that occurs as a result of an accidental, unplanned and/or unwanted event.</p> <p>The Guidelines for hazard identification and risk assessment seem to conflate the framework needed for risks expected from routine exploitation activities and hazards from accidents/incidents, resulting in the stated purpose of the Guideline being inconsistent with UNCLOS and the draft regulations: <i>‘Hazard identification and risk assessment activities should reduce the risk of Incidents and impacts of exploitation on the marine environment as much as reasonably practicable.’</i></p> <p>While this aim may be appropriate for reducing the risk of accidents/incidents (see draft regulation 32), it is unsuitable for reducing the routine impacts of mining, including pollution. UNCLOS unambiguously requires <i>‘necessary measures’</i> for the <i>‘effective protection for the marine environment’</i> (Art. 145), without limiting such measures to those that are <i>‘reasonably practicable.’</i> Put differently, UNCLOS does not allow harm to the environment beyond a certain cost-threshold.</p> <p>For the purposes of this guidance, it would be helpful to adopt a tighter definition so that it is focused on potential accidental (or unplanned or unwanted) events associated with mining (e.g., spills, collisions, loss of equipment, dropped objects, equipment failure and leaks). As some of the wording in the Guideline currently stands, the removal of nodules from the seabed could be described as a hazard whereas it is a planned activity of seabed mining (see also comments on paragraph 20 below).</p>	
Relationships between Guidelines	
<p>There are now several guidelines that have been developed and there is quite a lot of overlap and crossover between them. Some clarity would be beneficial in relation to the extent to which this guideline complements and interacts with the EIA standard and guideline, EMMP guideline, guideline on health and safety plans, etc.</p>	

which prescribe certain requirements in relation to risk assessment. For example, the EIA at scoping must be informed by an ERA and the EIS must contain the results of a prior ERA. Assessing the impacts of mining resulting from planned activities is at the core of the EIA and so treating the planned activities as hazards and subjecting them to a different assessment approach would confuse stakeholders and duplicate efforts. Additionally, risk assessment professionals (e.g. safety or process engineers) will not have the competence to predict and assess environmental consequences and environmental professionals (e.g. marine scientists and EIA practitioners) will not have the competence to predict such matters as equipment failure likelihood and modes of release of materials into the environment. This implies that there needs to be a cut-off and linkage between the Hazard Identification and Risk Assessment and other assessments and plans:

- Hazard and risk assessment identified failure modes, accidents etc., their likelihood of occurring and the characteristic of the event (environmental and/or health and safety - the material released, volumes, flow rates, location; health and safety);
- EIA uses this information to assess environmental consequences of unwanted events;
- EMMP uses this information to inform monitoring and management plans;
- Health and Safety Plan uses this information to assess health and safety consequences of unwanted events; and
- [uses for other applicable assessments and plans].

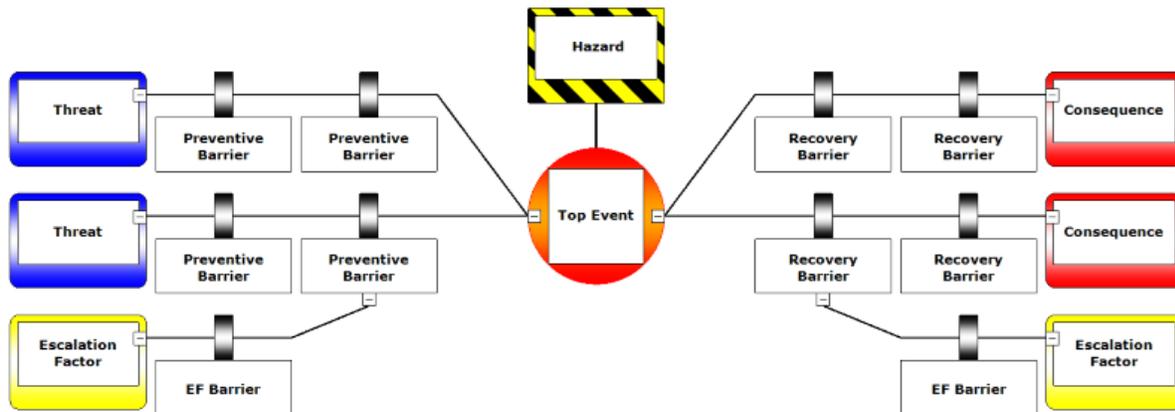
Higher likelihood events/more severe consequences are then focused on further in equipment design, project planning and developing operational procedures to reduce the risk to as low as reasonably practicable (ALARP).

Need for Safety Management System and Environmental Management System

The Guideline mentions how the risk assessment would provide input to other requirements such as a HSP and EIA. However, a HSP and EIA (and the risk assessment contained in each) specific to the project at hand. A HSP and EIA can only be implemented within the framework of a business, company or corporate Safety Management System and Environmental Management System, respectively. The Guideline needs to make reference to the Contractor being required to have a suitable Safety Management System (e.g. in accordance with ISO 45001:2018) and Environmental Management System (Draft Regulation 46).

Hazard Identification, Risk Assessment, Controls and Equipment Design

Realistically Contractors are unlikely to design equipment that still contains substantial risks by the time it is mobilized into remote deep ocean areas to commence mining. Hazard identification and risk assessment will run alongside design using techniques like the bow-tie approach illustrated below to factor in controls and barriers and understand the risks better, avoiding, minimizing and reducing them to ALARP as they go along. The Guideline is insufficiently clear on the expectations of the equipment design process and how those relate to “Good industry Practice” and “Best Available Techniques”.



source: [The bowtie method - CGE Barrier Based Risk Management Knowledge base \(cgerisk.com\)](http://www.cgerisk.com)

Enforcement

With the current draft regulations it is unclear how risk management systems will be enforced, as they are only referenced briefly in the review of Plan of Work and Annual Report draft regulations (DR 13 &38). Below is a list of items that the ISA/Sponsoring States may need to play a role in enforcing and should be addressed in the regulations, or another Standard:

- The extent to which risk assessments are undertaken and reported on;
- The quality of the assessment tools used, and any assumptions made in relation to treating risks;
- The expertise of people involved in the risk assessment process;
- The extent to which treatments of risks translate to management practices that are implemented on the ground; and,
- The extent to which contractors report on risks, risk management and incidents.

Transparency

The expectation of a “level playing field” in relation to both enforcement and quality control relies on transparency. The transparent sharing of risk assessment and management information will need to be required and also enforced. This has yet to be addressed in the Draft Regulations or any other Standards.

Specific Comments

Page	Line	Comment
1	36-43	Para. 2 states that: ‘rigorous risk management strategy is necessary at every phase of the project’, but subsequently no mention is made of the design of equipment and operating systems for mining. This is a critical stage in managing safety and the stage when the most important and effective risk assessment techniques (HAZID, HAZOP etc.) would be applied in similar industries.

1	61-62	regarding “as much as reasonably practicable” - see general comment “Purpose of the Guideline”
1	69-70	The hazard and risk assessment process as described by the guideline would provide ‘input’ to the EIA but not a ‘basis’ for the EIA. Suggest rewording accordingly. See general comment - “Relationship between Guidelines”
1	71	regarding “Provide for the protection of human life and safety” An oil and gas company, for example, would put providing ‘for the protection of human life and safety’ first and foremost. The Guideline should consider the same approach throughout.
2	76-77	According to the Guideline, section 1 is supposed to show how this Guideline “links to the regulations and other guidelines”, however, from our perspective this section does not make those connections. The section refers to regulations, standards and guidelines (S&G) broadly, rather than pointing out specific provisions in these documents (and Regional Environmental Management Plans) that the contractor must meet. We recommend that this section provide specific details for how this Guideline interacts with regulations, REMPs, and other S&Gs or that it reference Table 1 in section 3. which does provide more specific references to regulations in some rows and could be developed further.
2	99	Replace: “should also be considered” with “must also be read in conjunction” The REMP may contain obligatory statements in it “regarding regional hazards and risk elements”, so the language here should be stronger.
2	102-106	It would be more helpful to pull the content from these resources rather than point the contractor to additional documents with no clear guidance as to what elements they should focus on.
3	115	We suggest deletion of ‘policies’. Regulatory instruments are usually designed to implement predetermined policy, rather than being used as a vehicle to elaborate or embody their own policies. Numerous member States and other Stakeholders have suggested that the long list of policies and principles in draft regulation (DR) 2 be deleted. We agree and propose instead a simplified, and more comprehensively operational approach be taken - wherein the suite of ISA policy documents are simply cross-referenced in DR2, with a requirement that the Regulations are implemented in conformity with them. These policy documents should be developed as a matter of priority (before the Regulations), and can contain many of the important points that are currently listed in DR 2.
3	138	The Guideline conflates routine risks from mining with those from accidents. Line 138 claims that risk assessment attempts to answer the question: ‘What can go wrong?’. This applies to accidents/incidents but is not suitable for impacts of routing mining where the environmental risks arise not just when something goes wrong but indeed primarily arise from routine and “successful” mining operations. see also general comment - “Purpose of the Guideline”
	159	Figure 1: it is better to include the sensitivity of the receptor as a factor in addition to frequency and probability.
4	166-181	A list of stakeholder is provided which is more or less the same as for the EIA and would be consulted on environmental matters anyway. Since the focus of hazard and risk assessment should be on equipment failure, accidents and other unwanted events which may lead to consequences for people and the environment, possibly the most important stakeholder groups are those involved in designing and operating the equipment. Involving these personnel in undertaking the risk assessment and developing risk management and Health Safety and Environmental (HSE) plans will be critical in gaining ownership of HSE risk management. Ways of involving personnel include participating in workshops, highlighting where safety systems or procedures do not have the benefits claimed, commenting on the accuracy

		of technical reports, and participating in training. The Guideline needs to make this especially clear.
5	183	<p>Regarding Section 3: “Risk Assessment Process”</p> <p>It is really unclear how this guideline, and this section in particular, helps to inform the health and safety plan and environmental risk assessment included in the scoping report and the final EIA (in the submitted EIS). This section needs to clearly define how it relates/interacts with components of the Plan of Work that require a risk assessment. As stated in general comment above “Relationship between Guidelines” It actually might be helpful to break this guideline up into a few sections, with the first describing Hazard and risk assessment identified failure modes, accidents etc, their likelihood of occurring and the characteristic of the event (environmental and/or health and safety - the material released, volumes, flow rates, location; health and safety) and the subsequent sections describing how section 1 interacts with various components of the Plan of Work (e.g. Scoping Report’s environmental risk assessment, EIA’s final environmental risk assessment, EMMP, Health and Safety Plan, etc.). We believe reframing this document so that it is focused on unplanned events and restructuring it so it is clear how it interacts with the regulations, other S&Gs, and REMP will considerably improve this document.</p> <p>see general comments - “Purpose of the Guideline” and “Relationship with other Guidelines”</p>
5	185	What is “section 2.1”? Do you mean 2.A? This is a problem throughout the entire document and needs to be fixed, so it is clear what section is being referenced.
5	191-195	<p>Para. 16 and table</p> <p>The largest risks of unwanted events will stem from equipment failure or equipment not operating (or not being operated) as intended. The equipment design stage and testing of prototypes building up to the development of commercial scale equipment and preparing operational procedures are the times to address hazards and risks (and barriers and controls); this is not made sufficiently clear and should be emphasized above all else.</p>
5	Table	<p>Row 3 Column 3 - Regarding “EIA (guideline 2)”</p> <p>Shouldn’t this also reference the EIA Standard?</p> <p>Also, it would be helpful for Contractors as they are preparing this information to point them to the relevant sections in the regulations, Standards, and Guidelines rather than just pointing them to the document. This applies to other rows of the table.</p>
	206	Please add sociologic and technologic factors
6	218	Defining the risk criteria should not be left to the Contractor. This should be provided by the ISA through an Environmental objective, trigger and threshold Standard and relevant REMP and referenced here.
7	236	<p>Regarding “ALARP”</p> <p>This should reference para. 79.</p>
7	253-265	<p>Lines 135, 136 and 138 state: Risk assessment attempts to answer the following fundamental questions:</p> <p>“What can go wrong?”</p> <p>The items in lines 253 to 265 should focus exclusively on things that ‘could go wrong’ and give examples accordingly. Noise, changes in water composition, sediment plume effects are all things that will definitely happen as unavoidable and expected side effects of exploitation, not as the result of something (equipment failure, human error, outside agency) going wrong.</p>

		As such, many of the items in this list are confusing and need to be amended to make it clear and relevant.
8	280-289	Para. 23 implies that less rigorous risk assessment techniques could be used for the surface operations versus operations at the seabed. This is flawed for two reasons: 1) Risk to human health and life will be restricted to the surface operations and needs to be addressed rigorously. 2) While equipment will operate at depth and at the seabed it will be intrinsically connected to surface systems and controls. The whole operation from surface to seabed needs to be assessed with the same level of rigour. Suggest that this paragraph is reworded accordingly.
10	342-344	This para. should reference the regulations/standards that require the review of competent person and/or submission of documentation to verify qualifications. This includes the EMMP (see Annex VII). We have also proposed in our other comments that these reviews be a part of scoping report and EIS, so those should be included here if they are accepted.
12	419	It would be useful to point out that the EIA should fulfil the role of assessing environmental consequences based on information provided from the risk assessment, as the competency for doing this would sit in an EIA team and not with process safety professionals.
14	478-482	It would be helpful for contractors to have an example of what taking a precautionary approach for the ERA looks like. Suggest expanding on this point the EIA S&G, as it will be fundamental to the contractors producing satisfactory ERAs, and referencing para. 78.
	444	The duration of each project is different from the one of another project (less than five years, more than five years and even more than 10 years). Also, it depends on the severity of the incident. For the insignificant ones, they might take place more than once and should be taken into consideration.
	455	A part of the scale of consequences listed is not well differentiating between different consequences, especially when the same expression is used in no and low: “the water concentration is not expected to exceed limit values for chronic effects on biodata”. Also, regarding the notation of the considerable, large and severe: the same expression / definition is used: “the water concentration is expected to exceed limit values for chronic effects on biodata”. There is no mention of by how much percentage those limits are exceeded in each category to make the difference.
14	485	Replace: “purist” with “purest”
14	490-491	Regarding “(refer to guideline 2: EIA/EIS) These documents also don't list thresholds. This should reference an Environmental Obj, triggers, and thresholds Standard and relevant REMP...which have yet to be created, or in the case of the CCZ REMP have yet to include this information.
15	544	Regarding “Cumulative Risk” This part of the guideline is particularly confusing as it is effectively talking about the sort of cumulative effects assessment that would be addressed in the EIA. In the context of hazard and risk assessment cumulative risk is something quite different. If an item of plant, a procedure, or a person does not function as effectively as intended, then this represents a deviation from the norm (which could lead to an accidental or unwanted event) which needs to be managed through suitable control measures. From this it can be recognized that the management of each deviation individually may not necessarily ensure that the cumulative risk of several deviations acting together is properly managed. Cumulative risk assessment is an approach that covers the management of multiple deviations and the risks from them including their interaction.

16	562	<p>Regarding “Risk Treatment”</p> <p>Risk treatment is presented as coming after evaluation of risk whereas many ‘treatment measures’ will be inherent in equipment design, operational procedures etc. This is where a ‘bow-tie approach’ or similar is beneficial and should be discussed.</p> <p>See general comment - “Hazard Identification, Risk Assessment, Controls and Equipment Design”</p>
17	Figure 6	<p>The environmental controls part of this text overlaps with the remit of the EIA and would best be removed.</p> <p>See general comment - ‘Purpose of the Guideline’</p>
17	606-608	<p>Risk controls are not only reflected in health and safety and environmental plans, but should also be incorporated into equipment design and operating parameters, operational procedures and working methods so that they are applied, monitored and reviewed on an on-going basis.</p>
18	627-634	<p>The triggers for review are not suited to hazard and risk management. The first trigger for review should be a ‘near miss’ and not an actual incident. Other triggers should include changes to operating procedures, introduction of new equipment, changes in Contractor State health and safety legislation.</p> <p>Additionally, this part of the guideline would be substantially improved if in the regulations, or some other binding document, a provision required that all Contractors were made aware of a notifiable event reported by another Contractor and then were all required to review their own relevant plan (risk management, health and safety etc.).</p>
18	642-643	<p>This should be part of the Environmental Management System and as such this should reference the supporting regulation and Standards and guidelines, which have yet to be developed.</p>
19	714-715	<p>In a comment above (page 5, line 183) we proposed that it may be helpful to break this guideline up into a few sections, with the first describing Hazard and risk assessment identified failure modes, accidents etc., their likelihood of occurring and the characteristic of the event (environmental and/or health and safety - the material released, volumes, flow rates, location; health and safety) and the subsequent sections describing how section 1 interacts with various components of the Plan of Work (e.g. Scoping Report’s environmental risk assessment, EIA’s final environmental risk assessment, EMMP, Health and Safety Plan, etc.). We further propose that this new section 1 could follow the outline provided in para. 72 and under each of the headings could describe what content is required and recommended content in each section. The subsequent sections could then describe how the proposed hazards risk management template interacts with other components of Plan of Work than include a risk assessment.</p>
<p><i>Additional rows can be added to this table by selecting “Table” followed by “insert” and “rows below”</i></p>		

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