



Secretariat,
International Seabed Authority
14-20 Port Royal Street
Kingston, Jamaica
(submitted via email to ola@isa.org.jm)

June 11, 2021

RE: Stakeholder Consultation - Draft guidelines on tools and techniques for hazard identification and risk assessment

Sir/Madam,

Below, find below our Commentary on the Draft guidelines on tools and techniques for hazard identification and risk assessment as issued in May 2021.

As Group Leads, we submit on behalf of the **Deep-Sea Minerals Working Group of DOSI, the Deep-Ocean Stewardship Initiative**. The list of contributors is presented at the beginning of the document. Express Consent for sharing is granted.

Sincerely,

A handwritten signature in blue ink, appearing to be 'Sabine Gollner', written in a cursive style.

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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
<i>Contact information</i>	
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<i>General Comments</i>	
<p>The following DOSI experts commented on this document:</p> <p>Dr. Diva Amon, SpeSeas, Trinidad and Tobago; Natural History Museum, London, UK</p> <p>Dr. Patricia Esquete, University of Aveiro, Portugal</p> <p>Dr. Sabine Gollner, Royal NIOZ, The Netherlands</p> <p>Dr. Jesse van der Grient, University of Hawai’i, USA</p> <p>Dr. Aline Jaeckel, University of New South Wales, Australia</p> <p>Dr. Phillip Turner, Independent Scientist, UK</p> <p>Prof. Verena Tunnicliffe, University of Victoria, Canada</p>	
<p>We recognize the merit of constructing a document for tools and techniques for hazard identification and risks assessments. Deep-seabed mining is a completely new industry with</p>	

no precedents and for which techniques, technology and procedures are still largely undefined. Furthermore, there is a lack of examples of other seabed mining projects to assist with identifying hazards. The risks and hazards for humans and the environment of an industry of these characteristics are potentially severe and long lasting, while difficult to assess due to the novelty of the activities and the uncertainties involved. Another, major change is a large stakeholder group, that will include regulatory authorities, the scientific community, NGOs, and cultural authorities.

Notwithstanding the foregoing, we consider that this document is not sufficiently specific for the activities in question, and it is limited to the expected from routine exploitation activities in the seabed. Furthermore, it lacks sufficient detail for the contractors to be able to account for the variety of hazards and risks that deep-seabed mining will entail, which will not only include health and environmental events but also socioeconomic and cultural matters.

Please find below our general concerns as well as a list of specific comments. We also include suggestions for improving the document, as well as supporting references.

Specificity, Clarity and Standardisation

The relative lack of detail in this document can lead to confusion. It is unclear what parts are new requirements/guidelines and where more detail lies. While the guidelines avoid ‘prescription’, more standardisation can only help the ISA in the long term. With as many different approaches to hazard identification, risk analysis and mitigation approaches as there are Contractors, it will be very difficult to apply consistent review. In many cases, the lack of standards is a hindrance. For example, strongly recommending adherence to ISO 31000:2018 would begin that standardized approach. Another example: Para 17 “Establishing Context” would result in many different views from Contractors in the same region mining the same resource. Since the external context is the same, the ISA should establish perceptions/values of stakeholders. Similarly, the multiple ways to approach defining risk criteria will hinder adequate decision making. For instance, should a human life be given differing ‘tolerance’ levels? Or a whale strike?

Given that all Contractors will be well versed in the general principles - and applied before - there is a risk that the document will be quickly skimmed and more specific recommendations for deep-seabed mining applications will be reduced in importance. A potential solution is to put most of the basics into an Appendix to focus on key aspects relative to the application.

The document would also benefit from greater clarity in relation to the extent to which this guideline complements/interacts with the EIA standards and guidelines, guidelines on health and safety plans, etc. which prescribe certain requirements in relation to risk assessment.

Consistency with UNCLOS

The stated purpose of the Guideline is inconsistent with UNCLOS and the draft regulations: ‘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**’ (**emphasis added**).

While this aim might 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 “necessary measures” for the “effective protection for the marine environment” (Art. 145), without limiting such measures to those that are “reasonably practicable.” Consequently, UNCLOS does not allow harm to the environment beyond a certain cost-threshold.

Definition of “Risk”

The document does not define ‘Risk’. While the term is used variably in other settings, its application should be understood across ISA documents. A clear definition of ‘Risk’ will provide consistency in the related documents.

Register and Sharing of Risks, Hazards and Incidents

Analytics across Contractors and resources would contribute to better frequency analyses. We suggest that the ISA maintain its own Risk Register and Incident Summary.

Ecosystem, Socioeconomic and Cultural Issues

In its current form, the document seems to be largely focused on the risks and hazards for the personnel health and safety. A major concern is the lack of specific mentions of the environmental, socioeconomic, and cultural risks that the activities of the deep-seabed mining industry will entail. We strongly recommend adding specifications, examples, and details of such aspects. See details in the specific comments below.

Process of Developing the Standards and Guidelines

DOSI would like to see more transparency around the process for drafting the standards and guidelines. For example, a list of contributors and affiliations (both formal members of the technical working group, and formal and informal consultants) should be included. There is no information in the public domain about how contributors were selected, whether

objective criteria were applied, and whether conflict of interests were declared and/or managed.		
<i>Specific Comments</i>		
Page	Line	Comment
1	33	A diagram may help understand how this document relates to those named in the next paragraph. More specific reference to the ERA would be especially welcome.
1	46-49	<p>Within the ‘Purpose of this Guideline’ section, we strongly recommend making explicitly clear the importance of reviewing the risk management plan, particularly considering new knowledge and adjustments to REMPs. The expectations for review, as laid out in para 79 and 65, should be emphasized in this opening section.</p> <p>At the end of para 3, the following text could be included to emphasize the importance of review (adapted from para 79 and 65): “As stated in the Exploitation Regulations, “the reasonable practicability of risk reduction measures shall be kept under review in the light of new knowledge and technology developments.” “Review or audit of a risk management plan could also be undertaken periodically, following environmental and health and safety incidents, and when there is a substantive adjustment to the relevant Regional Environmental Management Plan (REMP)”.</p>
2	99-100	Para 8 highlights that “the appropriate Regional Environmental Management Plan (REMP) should also be considered by the Contractor...”. This emphasizes the need for REMPs to be in place before any application for exploitation is considered. It should also be emphasized here that any substantive adjustment to the relevant REMP should be considered by the Contractor. We suggest rephrasing as follows: “The appropriate Regional Environmental Management Plan (REMP), and any substantive adjustment subsequently made to the REMP, should also be considered by the Contractor in that it may affect more regional hazards and risk elements”.
3	130	We strongly recommend the ISO standard as a basic starting point, not as an alternative. Other resources might be useful to refine particular approaches.

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3	132	<p>Given the acknowledgement at line 120 that “all activities associated with the exploitation of minerals in the Area inherently involve some level of potential risk to the environment...”, we suggest to include reference to the mitigation hierarchy. We also advise that the processes described in this document should integrate the concept of the mitigation hierarchy throughout.</p>
3	138	<p>The Guideline conflates routine risks from mining with those from accidents. The question: ‘What can go wrong?’ applies to accidents/incidents but is not suitable where environmental risks arise, indeed primarily from routine and allegedly successful mining operations.</p>
4	165-181	<p>This document would greatly benefit from a comprehensive guidance or best practice as to how stakeholder identification can be ensured. Particularly, it should focus on how those that have been historically missed or marginalized from consultation be included or notified of opportunities for consultation. We suggest that consultation is required and should be advertised appropriately (with appropriate timescales) in all adjacent states or states through which some link is established to the proposed project. We also highlight the importance of considering whether capacity building efforts are necessary to support participation in consultation exercises.</p> <p>Specific reference should be made to Indigenous Peoples and Local Communities (IPLCs). Many IPLCs have a deep connection to the ocean and rely on ocean resources, many consider themselves resource custodians and care should be taken to include this perspective in stakeholder consultations. Specific reference to IPLCs will help to ensure a broad diversity of deep-sea perspectives are considered in the decision-making process. See: DOSI Policy Brief “The Necessity of Traditional Knowledge for Management of Deep-Seabed Mining” and Tilot et al., 2021.</p>
5	194	<p>Within the table, for “Project Phase: Detailed Plan of Work Design” and the “Phase-Specific Risk Assessment Characteristics”, specific reference should be made to the identification of socio-economic impacts. The text could read “Identification of hazards and evaluation of risks specifically associated with environmental impacts, socio-economic impacts, health and safety, security risks ...”</p>

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6	194	Within the table, for “Project Phase: Post-Closure Monitoring” and the “Submission to the Authority” column, there should be a timeframe for when the final performance assessment report is submitted to the ISA, unless the report is expected immediately (in which case it should be specified).
7	251	<p>In our opinion, the example hazard categories would benefit from including environmental, socioeconomic and cultural issues, such as:</p> <p>Ecosystem issues:</p> <ul style="list-style-type: none"> - habitat removal or destruction - sediment plume effects on the seafloor and water column - crushing of organisms by mining vehicles - Pollution - Tailings <p>Climatic and natural events:</p> <ul style="list-style-type: none"> - ocean acidification and other effects of climate change <p>Socioeconomic issues:</p> <ul style="list-style-type: none"> - uses of the ocean by traditional owners and indigenous communities - cultural significance of ocean spaces by local and indigenous communities <p>See: DOSI Policy Brief “The Necessity of Traditional Knowledge for Management of Deep-Seabed Mining” and Tilot et al.,2021.</p>
7	263	The current wording misrepresents the draft Regulations on Exploitation of Mineral Resources in the Area, Section III, part 5, 35. It is not human remains of an archaeological or historical nature, but instead is “human remains, objects and sites of an archaeological or historic nature”.
7	299-303	Measures of cost effectiveness of assessment rigour should be based on the precautionary principle and in line with the potential risk identified. That is, risks to some environmental aspects (e.g., provision of key ecosystem services such as climate regulation) could warrant a high-cost approach to fully understand the associated risks. Please consider amending.
8	309-314	For exploitation, it should be made clear that a purely qualitative approach to risk assessment is unlikely to provide the level of detail

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		required to assess risk and that Contractors should strive for QRA level of detail wherever possible.
11	385	We recommend mentioning Consequence Assessment prior to the frequency/probability assessment. We consider that if there are no consequences resulting from the identified hazard, then it will not be necessary to do Probability analysis.
11	405	We suggest adding: “where historical data is not available, the assessment must err on the side of caution, in line with the precautionary principle”. The same applies to the consequence assessment (Pg. 12).
12	436 & 442	<p>Many of the examples given in the ‘Consequence Assessment’ section focus on the impact on personnel and surface vessels and not the environment (line 422) or other human aspects. We recommend the addition of ecosystems, socioeconomic and cultural issues to the examples given, with the text becoming:</p> <p>Line 436: “Considering secondary consequences, such as those impacting upon associated ecosystems, activities, equipment or organizations.”</p> <p>Line 442: “Estimating (using models and correlations) the transport of the material and/or the propagation of the energy in the environment to the target of interest (people, structure, ecosystems, etc.)”.</p>
12	422	We do not consider that this example reflects “consequences”, but hazards to the environment. The Consequence is the effect on the environment or ecosystem. The event leads to hazard, which in turn, leads to consequence.
13	459	<p>Within the table, the details for each level of the consequence scale are well thought out but will be very difficult to achieve (e.g., knowing the limits for chronic effects on biota, understanding the timescales for recovery), emphasizing the importance of the precautionary principle.</p> <p>For the “Severe” category, recovery is not mentioned within the current description. We suggest the same wording as “Considerable” and “Large” - i.e., “Only partial recovery is possible, but in a long-term perspective (>1,000 years)”.</p>

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14	493-496	<p>Para 47 states that “until such time as sufficient data ... exists that the Authority establishes EIA thresholds ... Contractors could use project-specific and area-specific impact thresholds based on data and analyses commensurate in quality with the importance of the impact”. Whilst this appears practical, questions arise as to how consistency will be achieved across contractors if project-specific thresholds are developed and used. Clarification is needed as to how the ISA will review these project-specific thresholds and ensure regional consistency.</p>
15	550	<p>The definition of cumulative risks is incomplete. It should not be limited to mining impacts but instead include other activities and processes, such as fishing, submarine cables, climate change, etc. Otherwise, the risk assessment only assesses a part of the actual risks faced by the ecosystems in question. As the Preamble of UNCLOS recognizes: ‘the problems of ocean space are closely interrelated and need to be considered as a whole.’ Please consider amending.</p>
16	572-574	<p>We suggest adding “especially where uncertainty surrounding the risk is high” to the end of the sentence so that it is explicitly clear that when there is uncertainty around low risks (i.e., the green category in the risk matrix), the risk management may still be needed.</p>
16	587-590	<p>In para 60, which discusses the mitigation hierarchy (Figure 6), it needs to be made clearer that the hierarchy should be applied sequentially- i.e., options to avoid/prevent should be considered and exhausted before looking to minimize risks; options to minimize should be exhausted before considering rehabilitation or restoration measures, and restoration options should be exhausted before considering offsets.</p> <p>There is a body of literature discussing the limitations around restoration and offsets in a deep-seabed mining context (e. g., Van Dover et al., 2014, 2017; Niner et al., 2018.). Therefore, this guidance document should emphasize the need for contractors to focus on avoid/prevent and minimize before considering the latter two stages of the hierarchy.</p> <p>We suggest the following wording to be added to the end of Para 60: “The applicant or Contractor shall apply the mitigation hierarchy sequentially (working through a sequence of avoid/prevent through minimize, to restore/rehabilitate, to offset); however, in relation to</p>

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		environmental risks, the applicant or Contractor should pay particular focus to the first two stages of the hierarchy (avoid/prevent and minimize) to limit unavoidable impacts”.
18	627	A review should also occur when the ISA is informed of an incident with another Contractor that is relevant to others. Thus, we recommend rewording as follows: “When required by the ISA when relevant information on risk comes to its attention.”
19	697-699	The Contractor should also describe how consultation responses will be considered, as well as the reporting structure that will be used to document stakeholder comments and communicate responses to those comments where appropriate.
19	711-712	The final bullet point should be expanded so that reporting includes how the applicant responds to stakeholder interactions and comments. We suggest: “Assist with interactions with stakeholders, including those with responsibility and accountability for risk management activities, and document where stakeholder comments have been considered”.
20	733-742	The tabulation of risk events considered, including the events excluded and the reasons for excluding them, should be made available as an annex to the EIS, with a link to the full report produced by the applicant. By having the full Risk Register available in the EIS, stakeholders will more easily understand what has been included/excluded from the EIA.
20	767	“Design the risk management program to reduce the risk of Incidents as much as reasonably practicable, to the point where the cost of further risk reduction would be grossly disproportionate to the benefits of such reduction, taking into account the relevant guidelines.” This focus on cost-benefit of environmental protection measures is not consistent with UNCLOS, which requires “necessary measures” for the “effective protection for the marine environment” (Art. 145). We suggest deleting paragraph 77(2) or to replace it with text that reflects Article 145 of UNCLOS.
<p>References</p> <p>DOSI Policy Brief “The Necessity of Traditional Knowledge for Management of Deep-Seabed Mining”.</p>		

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Niner, H.J., Ardron, J.A., Escobar, E.G., Gianni, M., Jaeckel, A., Jones, D.O., Levin, L.A., Smith, C.R., Thiele, T., Turner, P.J. and Van Dover, C.L. (2018). Deep-sea mining with no net loss of biodiversity—an impossible aim. *Frontiers in Marine Science*, 5, p.53.

Tilot, V., Willaert, K., Guilloux, B., Chen, W., Mulalap, C. Y., Gaulme, F., ... & Dahl, A. (2021). Traditional dimensions of seabed resource management in the context of Deep Sea Mining in the Pacific: Learning from the socio-ecological interconnectivity between island communities and the ocean realm. *Frontiers in Marine Science*, 8, 257.

Van Dover, C.L., Aronson, J., Pendleton, L., Smith, S., Arnaud-Haond, S., Moreno-Mateos, D., Barbier, E., Billett, D., Bowers, K., Danovaro, R. and Edwards, A. (2014). Ecological restoration in the deep sea: Desiderata. *Marine Policy*, 44, pp.98-106.

Van Dover, C.L., Ardron, J.A., Escobar, E., Gianni, M., Gjerde, K.M., Jaeckel, A., Jones, D.O.B., Levin, L.A., Niner, H.J., Pendleton, L. and Smith, C.R., (2017). Biodiversity loss from deep-sea mining. *Nature Geoscience*, 10(7), pp.464-465.

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