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Assuring Environmental Compliance in Deep-Sea Mining: Lessons from Industry and Regulators Executive Summary

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EXECUTIVE SUMMARY

Introduction

The International Seabed Authority (ISA) was established by the United Nations Convention on the Law of the Sea (UNCLOS) and invested with authority over the “seabed and ocean floor and subsoil thereof.” UNCLOS requires the ISA to adopt rules, regulations, and procedures that ensure “effective protection for the marine environment from harmful effects which may arise” from seabed mining. UNCLOS also obliges the ISA “to exercise such control over activities in the Area as is necessary for ... securing compliance.”

This report recommends procedures and practices for the International Seabed Authority (ISA) that could help assure compliance with ISA environmental regulations governing the exploitation of mineral resources on the ocean floor beyond national jurisdiction.

The ISA is currently in the process of developing regulations to govern seabed mineral exploitation. The ISA’s Legal and Technical Commission (LTC) has submitted to the ISA Council, the Authority’s executive arm, a series of drafts of those regulations. Discussions in the Council revealed a common interest in understanding how the environmental protections of the draft regulations could be translated into responsibilities and procedures that would best assure compliance.

This report is intended to inform those discussions. It examines environmental compliance standards, responsibilities, and mechanisms governing extractive industries in other sectors and jurisdictions, as well as the various roles and obligations assigned to regulators, Contractors, and independent experts in assuring environmental compliance. It considers how those models and lessons learned could apply to the unique constitutional character and governance mechanisms that UNCLOS created for the ISA.

The report’s key findings and its recommendations to the ISA are presented within six topic areas:

- Institutional Frameworks
- Compliance Promotion
- Compliance Monitoring
- Compliance Enforcement
- Public Reporting, Accountability and Transparency
- Assessing Effectiveness

Within each of the six topics the report considers a series of case studies that describe and critique environmental compliance systems of extractive industries and regulatory agencies in various national and regional jurisdictions. The report considers the relevance of those case studies in the seabed mining context and recommends corresponding actions and approaches for the ISA. A fundamental recommendation that the report applies to all six topics is the need for enhanced transparency and accountability.

Contributors and Sources. This report is the culmination of 12 months of research and investigation. It is informed by studies, meetings, and interviews conducted as part of an overall inquiry into best practices for defining and enforcing environmental protections should the ISA decide to move from exploration to exploitation.

The report—and the management of the overall effort that informs it—was undertaken by [Kevin Murphy](#) of KM Environmental Consulting (UK). Dr. Murphy draws on extensive experience analyzing environmental compliance practices as well as new research on, and interviews with, past and current members of regulatory communities.

This report focuses special attention on the environmental compliance assurance structures and practices of organisations from three sectors:

Environmental and Natural Resource Protection Agencies: South Africa Department of Environmental Affairs; New Zealand Environmental Protection Authority; Hong Kong Environmental Protection Department; Pacific Island States subscribing to the Nauru Agreement; United Kingdom Marine Management Organisation.

Extractive Industry Corporations: BP; Chevron; Shell; Rio Tinto.

International Finance: European Bank for Reconstruction and Development.

These investigations are further detailed in the accompanying report and forthcoming case studies.

The report also draws on discussions and recommendations of a panel of international experts from industry, regulatory agencies, and environmental organisations. The panel met for a two-day workshop in London to review early drafts of the report and suggest additions and deletions. The panel members are:

[Matthew Bateson](#), former Head, Environment & Legacy Management, Rio Tinto; [David Carlin](#), Science Director, UK Centre for Environment, Fisheries & Aquaculture Science; [Adam Cook](#), former Head of Evidence, UK Marine Management Organisation; [Robert Coyle](#), former Senior Environmental Advisor, European Bank for Reconstruction & Development; [Ana Garzón](#), former Officer, International Social and Environmental Accreditation and Labelling Alliance; [Renee Grogan](#), Principal, Gro Sustainability Ltd; [Miguel Ruiz-Larrea](#), former Global Social Performance Manager, Shell Oil; [Bradley Soule](#), Chief Fisheries Analyst, OceanMind and Kevin Murphy of KM Environmental Consulting,

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Summaries of Key Recommendations

What follows is a compilation and abridgment of some of the most salient recommendations in the report. Readers are urged to consult the accompanying report for a more comprehensive review.

Institutional Frameworks

Case Study Learnings

All the organisations studied (public and private) had clear lines of accountability to government ministers or business boards of directors and thence to the public and shareholders.

Those responsible for compliance assurance had clear positions within their governance structures.

Several organisations set out clear roles and responsibilities for those involved in environmental regulation or environmental management down to individual levels.

Most regulatory organisations prepared strategic plans for the years ahead to help focus compliance activities and to provide a basis for annual performance assessment and funding.

Funding was provided from central budgets and, in the case of regulatory organisations funds, through the levy of charges for processing applications.

The staff involved in compliance assurance and other environmental management/regulatory activities were appointed in full-time roles from a national/regional/global pool of suitably qualified environmental professionals.

Environmental regulatory organisations were ring-fenced from other government and regulatory functions up to the level of government ministers.

Recommendations

- The ISA Legal and Technical Commission should include more environmental specialists to ensure that the Commission meets its environmental obligations under UNCLOS Article 165.
- Alternatively, the ISA Council could exercise its powers under UNCLOS Article 162 and establish an Environment Commission separate from the Legal and Technical Commission.
- The ISA should establish an Environment Department within the ISA Secretariat that reports via the Secretary-General to the ISA Council.
- Within the ISA Environment Department, there should be an Office of Environmental Compliance. The Office of Environmental Compliance should have assured access to all Contractor data and reports. It should be staffed by qualified professionals with suitable industry or regulatory experience. It should include an Audit and Inspection Team composed of trained specialists.
- The Environment Department should include an Evidence Team charged with consulting ISA stakeholders and outside experts on the information available and the information needed to inform robust, evidence-based decisions; engaging Contractors and Sponsoring States on joint research projects; and managing and updating the ISA database.
- The ISA should provide adequate financial resources to support its environmental compliance assurance activities.

Compliance Promotion

Case Study Learnings

Across organisations, best practices in compliance promotion included awareness raising, provision of and access to guidance, outreach activities and use of incentives.

Regulators took proactive approaches with their 'regulated communities' to raise awareness of compliance requirements and how to meet them.

Industry associations played a key role in raising awareness as a platform for matters like developing codes of conduct, codes of practices and other guidance materials.

Environmental compliance materials were clearly visible and/or readily accessible from organisations' website home pages.

Most organisations provided relevant examples of good and best practice (or 'best practicable means').

Some organisations provided evidence-based material that could be used in their own decisions or to support undertaking Environmental Impact Assessments (EIAs) and related studies. Much of this material was developed through collaborative approaches with industry (including funding by them) and joint industry projects.

Many organisations made use of web-based and interactive tools (including geospatial ones) in their compliance promotion.

All the organisations studied adopted outreach approaches, including multi-stakeholder workshops in host countries aimed at awareness raising and knowledge transfer.

Incentives were also used as a means of compliance promotion and ranged from supplier registration schemes to public recognition of good industry practice through awards.

Recommendations

- The ISA should encourage Contractors and Sponsoring States to establish an industry association that could promote model codes of conduct and practice. The ISA itself should approve a model code of conduct and performance for the Enterprise. Model codes should emphasize obligations that require environmental protection commitments at all levels.
- The ISA should publish guidance on the full suite of environmental obligations and approaches expected for would-be exploitation Contractors and Sponsoring States.
- The ISA should maintain an environmental compliance service to provide Contractors and Sponsoring States with key scientific papers, regularly updated case studies and reporting templates. The ISA should also offer a directory and registration system for approved providers of environmental services.
- Given lack of data to inform an evidence base on the long-term effects of deep sea mining, and corresponding lack of key information for the preparation of Environmental Impact Assessments (EIAs), the ISA should develop an "evidence based plan" to fill in these gaps. The ISA should require all Contractors to contribute material to this evidence base, including model validation, monitoring impact and effect data (with corresponding evaluations) and testing results for mitigation measures.
- The ISA should conduct due-diligence reviews of exploration Contractors and their compliance records. These reviews should be made public. The ISA should further develop capacity-building workshops aimed at exploration Contractors with inadequate compliance records. Other capacity-building workshops should be offered to exploration Contractors considering applications for exploitation.
- The ISA should develop Standard Operating Procedures for its own compliance-assurance staff.

- The ISA should develop an Awards Program for innovative technology designs that minimize environmental impacts.

Compliance Monitoring

Case Study Learnings

Monitoring activities were generally carried out within a clear framework, like a compliance and enforcement strategy in the case of regulators or an environmental management system in the case of private sector companies.

Self-reporting by operators, and review of that information by regulators and their compliance teams, was a key aspect of compliance monitoring. Operator reporting was in accordance with an environmental management and monitoring plan (EMMP) or something similar. Some regulators facilitated reporting through an online portal.

Regulator inspection activities included review of data and visits to operations in accordance with pre-planned programs developed from a risk-based approach (see below). Operators also conducted their own inspections, normally by qualified environmental auditors from elsewhere in the business or the corporate center.

Independent (or third-party) verification was aimed at verifying that suitable systems were in place and being used. Both private sector companies and international lenders included this approach in their compliance assurance practices.

Organisations prioritized their compliance monitoring through a risk-based approach. Typically, they considered the environmental consequences of non-compliance alongside the regulated party's attitude to, and record of, compliance.

Organisations recognized that data generated from monitoring had value beyond demonstrating compliance. It also contributed to the evidence base and needed to be managed accordingly.

Recommendations

- Compliance assurance monitoring should be made equally effective for all Contractors, be they States, State enterprises, private businesses, joint ventures, or the Enterprise.
- The ISA should regularly consult with experts from international oil, gas, and mineral exploitation on monitoring practices that might be applicable to deep-sea mining.
- A provisional compliance-monitoring system should control the pioneer phase of deep-sea mining and should be revised in light of lessons learned in practice. Test-mining, perhaps via a joint venture with the Enterprise, could present an opportunity for system verification.
- Contractors should be required to submit real-time details on the location and functions of their vessels through an accredited satellite automatic identification system.
- The ISA should revise and clarify the thresholds that would oblige a Contractor to report a compliance-related emergency.
- A compliance monitoring data management strategy should be developed to cover data formats, quality checks, provenance, uses, licensing, training and publication. A data management system should ensure Contractors' real-time reporting of specified parameters in specified formats.
- Contractors should be required to set interim thresholds that trigger appropriate preventative action prior to breaches of any ISA-set environmental limits.
- The ISA should explore with commercial providers the means of assuring reliable internet connectivity for all operations in the Area.
- The ISA should develop a template for monthly or quarterly environmental reports from Contractors. Contractors should describe on-site operations, including statistical analyses and

trend assessments. The ISA should also require from Contractors periodic reports that examine possible long-term effects of operations on the environment against what the Contractor had predicted in its Environmental Impact Assessment (EIA) and what the ISA had assessed in the relevant Regional Environmental Management Plan (REMP).

- Failure by a Contractor or Sponsoring State to meet reporting requirements—including those for data, timely submission, and public availability—should be addressed by the ISA in accordance with its environmental compliance assurance policies.
- The ISA should require Contractors and encourage Sponsoring States (and other interested parties) to fund collaborative studies on important areas of uncertainty regarding environmental impacts common to all Contractors within a given region or employing similar mining technologies.
- Standard practices and procedures should ensure that environmental information is publicly available. Environmental information should be defined to include all EIA baseline information, all monitoring data gathered in the development of EMMPs, all environmental incident reports, and all environmental inspections audits.
- The role of ‘inspections’ should be clearly defined in the wider context of environmental compliance assurance. It should consider environmental auditing (or inspection) as a specialist area to be addressed separately from broader inspection activities, ideally by an ISA ‘compliance team’, operating within an ‘environment department’ reporting to the Secretary-General (as recommended above).
- The ISA should employ a “risk-based” approach to compliance monitoring, with the criteria for determining risk communicated in advance to all Contractors and other interested parties.

Compliance Enforcement

Case Study Learnings

Regulatory and other organisations generally worked within a compliance enforcement strategy that progressively escalated enforcement through a series of steps ranging from administrative actions to ‘stop notices’ to criminal prosecutions.

An important aspect of most strategies was to take enforcement actions to encourage compliance as a first recourse and avoiding later more punitive stages.

Particularly good practice involved working closely with the regulated party to understand the reasons for non-compliance and return to a compliant status. This process was formally captured in an environmental improvement plan (or similar).

Criminal prosecution was regarded as an important tool in discouraging non-compliance. Regulators had powers to investigate, seize evidence, and to bring prosecutions.

Recommendations

- The ISA should develop a Compliance Enforcement Strategy which would include triggers for compliance action and emphasize early dialogue between the ISA and Contractors to promote mutually agreeable corrective action before issuing formal compliance notices.
- If a formal compliance notice is issued, the ISA and the Contractor should agree on an Environmental Improvement Plan. Failure to comply with an Environmental Improvement Plan could expose the Contractor to an enforced suspension of activities. Continued non-compliance

could result in full revocation of the contract and monetary penalties; also, referral to the Sponsoring State for civil or criminal sanctions.

- Sponsoring States and Flag States should be encouraged to develop and enforce their own Compliance Enforcement Strategies. Dedicated funds from the ISA, its Member States, and its Observers could be made available to developing countries for that purpose. Sponsoring States might establish more exigent environmental compliance standards than those set by the ISA, but should not establish lesser standards.
- In instances where there are multiple parties involved in meeting the obligations of an ISA exploitation contract (e.g., Contractor; Sponsoring State; Flag State), the ISA should see to it that the contract in question sets out clear protocols for each party's environmental compliance responsibilities.
- Criminal prosecution should be regarded as an enforcement measure of last resort. Since the ISA is not a sovereign entity, any criminal prosecution would have to take place within the judicial systems of Sponsoring States. The ISA should encourage all Sponsoring States to identify the civil and criminal sanctions that could be appropriate within their domestic legal regimes, and to provide some description of their laws and regulatory capabilities in any application for a Plan of Work. Sponsoring States should be encouraged to harmonize their laws and practices in this regard.
- The ISA should publish and regularly update Contractor environmental compliance records. The information may be particularly relevant for potential buyers of Contractor minerals and others along the supply chain with ethical procurement policies.
- The ISA should require Contractors to provide a list of their suppliers of goods and services and their respective environmental-compliance records.

Accountability and Transparency

Case Study Learnings

Providing public access to information is a key aspect of transparency and organisational accountability to public stakeholders.

Generally, all environmental documents provided by an applicant or involved in an approval process were made publicly available and ample time was allowed for public review and participation. This included both applicant EIA documents and evidence material gathered by a regulator to support its decision.

Some regulators went further and published the environmental monitoring and audit programs for projects, and the results of corresponding monitoring and auditing. Compliance enforcement actions were also placed on the public record.

Private sector companies publicly reported on their sustainability (environmental, social etc.) performance against certain key indicators, following the Global Reporting Initiative.

Regulator reporting included plans and targets for the year ahead and performance reviews against the previous year's targets, including for environmental compliance assurance activities.

Most of the organisations reviewed (both regulator and private sector) placed importance upon effective whistle blowing procedures and action upon whistle blower reports.

Most of the organisations reviewed (both regulator and private sector) had clear and accessible processes for the public to register complaints and for the respondent to act upon them.

Recommendations

- The submission, scrutiny and approval of EIAs and EMMPs should be a public process, with sufficient time available for external inputs. They should begin with the publication of a Scoping Report and EIA Terms of Reference, along with the studies, reports, testimonies, and other documentation that inform them. The Council may decide that certain non-environmental information may be withheld from the public for proprietary reasons cited in UNCLOS. Once an EIA has won approval, the ISA should publish a Decision Report that provides information from the application and summaries of public inputs. There should be sufficient time between the release of the Decision Report and consideration by the Council for the submission of comments from outside experts.
- The following documents should be available to the public: contracts and Plans of Work, including EIAs, Environmental Impact Statements and EMMPs; rationales for the decisions of ISA bodies; Annual Reports; environmental management reports; audits and inspection reports; periodic reviews of Plans of Work; incidence reports; compliance notices; Environmental Improvement Plans; and reports of enforcement actions.
- The ISA should issue public reports on the compliance records of exploration Contractors.
- Reporting requirements should define environmental information and require its disclosure and publication. The ISA should impose a burden of proof on Contractors and the LTC to justify the withholding of information on grounds of protecting intellectual property rights or conserving competitive advantage.
- The ISA should develop its Deep Data initiative so that it becomes a fully interactive geospatial data repository with open access to all. The portal should provide public and private information on marine mineral resources acquired from ISA Contractors and other institutions and should be made publicly available.
- The ISA should require Contractors to produce, in a specified format, an annual “Sustainability Report” for a broad public audience. The report should be independently verified by a recognized international authority.
- The ISA should develop and implement a Whistle Blowing policy and procedures for its staff, Contractors and external advisers that assure confidentiality. An ISA Ombudsman office could be established for the purpose.
- A formal mechanism should enable any party to submit a complaint about any aspect of environmentally related processes and activities of the ISA, its Contractors, or Sponsoring States.
- The ISA should develop and publish a Strategic Compliance Plan and Annual Performance Plan. The ‘strategic plan’ should cover the next five years and be refreshed annually based on reviews of performance. The ‘annual performance plan’ should set out environmental compliance assurance actions for the coming year that are aimed at delivering the outcomes set out in the strategic plan and contains key indicators that the ISA’s effectiveness in environmental regulation can be reviewed against (on an on-going and end of year basis). Stakeholders and Contractors should be consulted in the development of the plans.

Assessing Effectiveness

Case Study Learnings

Most organisations undertook internal assessments of their effectiveness in delivering their environmental compliance assurance actions against their previously published plans and targets for the year ahead.

Some regulators sought to identify measures and associated key performance indicators that supported strategic policy objectives (e.g. in the form of an action plan or similar) and track delivery against the action plan. Tracking the actions and reviewing effectiveness was then an on-going process through the year as well as involving end of year reviews.

Private sector companies tended to conduct on-going assessment and review of the effectiveness of their compliance actions.

Regulator effectiveness was also assessed externally. One regulator was held to account by other government agencies and public bodies for the effectiveness of its compliance assurance actions. Another used an international organisation to assess and report on its effectiveness.

Private sector companies tended to subject their compliance assurance practices to external scrutiny as part of annual verification of their overall environmental management systems.

Recommendations

- The ISA should establish a transparent and consultative process through which it conducts and publishes an annual assessment of its work on environmental compliance assurance against targets and the Strategic Plan. It should also commission and publish a parallel assessment from an external source. The annual assessment should be presented to the ISA Council and made available to the public. The ISA should encourage Contractors and Sponsoring States to undertake the same exercise.
 - The ISA should consider the adoption of a “live touch dashboard” approach for the first five years of establishing its environmental compliance assurance policies and for the first five years of any new exploitation contract. Such an approach would involve monthly reviews of a Contractor’s environmental compliance performance measured against targets and indicators set at the beginning of each year.
 - The ISA should establish an Ombudsman office: an independent and impartial party able to identify or investigate unresolved issues or complaints.
 - The ISA and its Contractors should maintain an active outreach program to engage civil society in general and scientific and environmental constituencies in particular.
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