

2020

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

Kevin Murphy

KM Environmental Consulting

Table of Contents

| | | |
|-------|---|----|
| 1 | Acknowledgments..... | 7 |
| 2 | Introduction | 8 |
| 2.1 | Background to this Report | 8 |
| 2.2 | Purpose of this Report | 8 |
| 2.3 | Environmental Compliance Assurance | 9 |
| 2.4 | Study Methodology..... | 10 |
| 2.5 | Organisation of this Report..... | 11 |
| 3 | Underpinning Environmental Compliance Assurance | 13 |
| 3.1 | Introduction | 13 |
| 3.2 | Establishing Compliance Requirements..... | 13 |
| 3.2.1 | General Considerations..... | 13 |
| 3.2.2 | Rules, Regulations and Standards..... | 13 |
| 3.2.3 | The Role of EIAs and EMMPs | 15 |
| 3.3 | Contractor and Contracting State Capacity for Compliance..... | 17 |
| 3.3.1 | Round Table Discussion Inputs | 17 |
| 3.3.2 | Context for DSM and the ISA | 17 |
| 3.3.3 | Recommendations | 17 |
| 3.4 | Strategic Public Consultation | 18 |
| 3.4.1 | Round Table Discussion Inputs | 18 |
| 3.4.2 | Context for DSM and the ISA | 18 |
| 3.4.3 | Recommendations | 19 |
| 4 | Institutional Framework..... | 20 |
| 4.1 | Introduction | 20 |
| 4.2 | Accountability for Environmental Performance | 20 |
| 4.2.1 | Learnings from the Case Studies..... | 20 |
| 4.2.2 | Context for DSM and the ISA | 22 |
| 4.2.3 | Recommendations | 22 |
| 4.3 | Clear Structure for Governance | 24 |
| 4.3.1 | Learnings from the Case Studies..... | 24 |
| 4.3.2 | Context for DSM and the ISA | 24 |
| 4.3.3 | Recommendations | 26 |

| | | |
|-------|--|----|
| 4.4 | Clearly Set Out Roles and Responsibilities..... | 29 |
| 4.4.1 | Learnings from the Case Studies..... | 29 |
| 4.4.2 | Context for DSM and the ISA | 29 |
| 4.4.3 | Recommendations | 29 |
| 4.5 | Strategic Planning for Assurance | 29 |
| 4.5.1 | Learnings from the Case Studies..... | 29 |
| 4.5.2 | Context for DSM and the ISA | 30 |
| 4.5.3 | Recommendations | 31 |
| 4.6 | Adequacy and Transparency of Funding..... | 32 |
| 4.6.1 | Learnings from the Case Studies..... | 32 |
| 4.6.2 | Context for DSM and the ISA | 32 |
| 4.6.3 | Recommendations | 33 |
| 4.7 | Staff Resources, Training and Competencies/Qualification | 34 |
| 4.7.1 | Learnings from the Case Studies..... | 34 |
| 4.7.2 | Context for DSM and the ISA | 34 |
| 4.7.3 | Recommendations | 34 |
| 4.8 | Ring-fenced Environmental Management Functions | 35 |
| 4.8.1 | Learnings from the Case Studies..... | 35 |
| 4.8.2 | Context for DSM and the ISA | 35 |
| 4.8.3 | Recommendations | 36 |
| 5 | Compliance Promotion | 38 |
| 5.1 | Introduction | 38 |
| 5.2 | Processes for Raising Awareness | 39 |
| 5.2.1 | Learnings from the Case Studies..... | 39 |
| 5.2.2 | Context for DSM and the ISA | 39 |
| 5.2.3 | Recommendations | 39 |
| 5.3 | Availability and Accessibility of Guidance..... | 40 |
| 5.3.1 | Learnings from the Case Studies..... | 40 |
| 5.3.2 | Context for DSM and the ISA | 40 |
| 5.3.3 | Recommendations | 41 |
| 5.4 | Provision of Guidance and Indicating Good/Best Practice | 41 |
| 5.4.1 | Learnings from the Case Studies..... | 41 |

| | | |
|-------|---|----|
| 5.4.2 | Context for DSM and the ISA | 42 |
| 5.4.3 | Recommendations | 42 |
| 5.5 | Provision of Evidence-Based Material and Knowledge in General | 43 |
| 5.5.1 | Learnings from the Case Studies | 43 |
| 5.5.2 | Context for DSM and the ISA | 44 |
| 5.5.3 | Recommendations | 45 |
| 5.6 | Use of Web-based and Interactive Tools | 46 |
| 5.6.1 | Learnings from the Case Studies | 46 |
| 5.6.2 | Context for DSM and the ISA | 46 |
| 5.6.3 | Recommendations | 47 |
| 5.7 | Outreach Activities | 47 |
| 5.7.1 | Learnings from the Case Studies | 47 |
| 5.7.2 | Context for DSM and the ISA | 47 |
| 5.7.3 | Recommendations | 48 |
| 5.8 | Use of Incentives | 48 |
| 5.8.1 | Learnings from the Case Studies | 48 |
| 5.8.2 | Context for DSM and the ISA | 49 |
| 5.8.3 | Recommendations | 49 |
| 6 | Compliance Monitoring | 50 |
| 6.1 | Introduction | 50 |
| 6.2 | Overall Management Framework for Monitoring | 50 |
| 6.2.1 | Learnings from the Case Studies | 50 |
| 6.2.2 | Context for DSM and the ISA | 53 |
| 6.2.3 | Recommendations | 54 |
| 6.3 | The Role of Self-monitoring and Reporting | 55 |
| 6.3.1 | Learnings from the Case Studies | 55 |
| 6.3.2 | Context for DSM and the ISA | 56 |
| 6.3.3 | Recommendations | 57 |
| 6.4 | The Role of Regulator/Company/Bank Inspection and Audit | 59 |
| 6.4.1 | Learnings from the Case Studies | 59 |
| 6.4.2 | Context for DSM and the ISA | 60 |
| 6.4.3 | Recommendations | 61 |

| | | |
|-------|---|----|
| 6.5 | The Role of Independent or Third-party Verification | 62 |
| 6.5.1 | Learnings from the Case Studies | 62 |
| 6.5.2 | Context for DSM and the ISA | 63 |
| 6.5.3 | Recommendations | 63 |
| 6.6 | Targeting and Prioritisation (Risk-based Approach) | 64 |
| 6.6.1 | Learnings from the Case Studies | 64 |
| 6.6.2 | Context for DSM and the ISA | 64 |
| 6.6.3 | Recommendations | 64 |
| 6.7 | Data Management | 65 |
| 6.7.1 | Learnings from the Case Studies | 65 |
| 6.7.2 | Context for DSM and the ISA | 65 |
| 6.7.3 | Recommendations | 66 |
| 7 | Compliance Enforcement..... | 68 |
| 7.1 | Introduction | 68 |
| 7.2 | Overall Approach to Compliance Enforcement | 68 |
| 7.2.1 | Learnings from the Case Studies | 68 |
| 7.2.2 | Context for DSM and the ISA | 69 |
| 7.2.3 | Recommendations | 70 |
| 7.3 | Approach to Criminal Enforcement | 71 |
| 7.3.1 | Learnings from the Case Studies | 71 |
| 7.3.2 | Context for DSM and the ISA | 72 |
| 7.3.3 | Recommendations | 72 |
| 7.4 | Other Sanctions..... | 73 |
| 7.4.1 | Learnings from the Case Studies | 73 |
| 7.4.2 | Context for DSM and the ISA | 73 |
| 7.4.3 | Recommendations | 73 |
| 8 | Public Reporting, Accountability and Transparency | 75 |
| 8.1 | Introduction | 75 |
| 8.2 | Overall Scope and Transparency of Reporting | 75 |
| 8.2.1 | Learnings from the Case Studies | 75 |
| 8.2.2 | Context for DSM and the ISA | 76 |
| 8.2.3 | Recommendations | 77 |

| | | |
|-------|---------------------------------------|----|
| 8.3 | Annual Performance Reporting | 78 |
| 8.3.1 | Learnings from the Case Studies | 78 |
| 8.3.2 | Context for DSM and the ISA | 79 |
| 8.3.3 | Recommendations | 79 |
| 8.4 | Whistle Blowing | 79 |
| 8.4.1 | Learnings from the Case Studies | 79 |
| 8.4.2 | Context for DSM and the ISA | 80 |
| 8.4.3 | Recommendations | 80 |
| 8.5 | Complaints Procedures | 80 |
| 8.5.1 | Learnings from the Case Studies | 80 |
| 8.5.2 | Context for DSM and the ISA | 81 |
| 8.5.3 | Recommendations | 81 |
| 9 | Assessing Effectiveness | 82 |
| 9.1 | Introduction | 82 |
| 9.2 | General Considerations | 82 |
| 9.2.1 | Learnings from the Case Studies | 82 |
| 9.2.2 | Context for DSM and the ISA | 82 |
| 9.2.3 | Recommendations | 83 |
| 9.3 | Internal Assessment Practices | 83 |
| 9.3.1 | Learnings from the Case Studies | 83 |
| 9.3.2 | Context for DSM and the ISA | 84 |
| 9.3.3 | Recommendations | 85 |
| 9.4 | External Assessment Practices | 85 |
| 9.4.1 | Learnings from the Case Studies | 85 |
| 9.4.2 | Context for DSM and the ISA | 86 |
| 9.4.3 | Recommendations | 86 |

1 ACKNOWLEDGMENTS

This paper was researched and written by Dr. Kevin Murphy of KM Environmental Consulting.

Special thanks to current and former employees of many of the organisations that were subjects of the case studies for undertaking reviews and providing comments. Thanks also to the experts who reviewed this white paper, including Chris Brown, Independent Consultant and advisor to the ISA; and Dr. Adam Cook, former Head of Evidence at the UK Marine Management Organisation and former Scientific Affairs Officer at the International Seabed Authority. Although they reviewed various drafts and the paper's findings, neither they nor their organisations necessarily endorse the conclusions.

This study was commissioned by The Pew Charitable Trusts. Pew is not responsible for errors within and does not necessarily endorse the opinions and conclusions.

2 INTRODUCTION

2.1 BACKGROUND TO THIS REPORT

The International Seabed Authority (ISA) is currently developing regulations on exploitation of mineral resources in the 'Area'. The Area is defined by Article 1 of the United Nations Convention on the Law of the Sea (UNCLOS)¹ as *"the seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction."* In accordance with articles 145 and 153 of UNCLOS, the ISA is mandated to adopt rules, regulations and procedures to ensure effective protection for the marine environment from harmful effects which may arise from seabed mineral activities in the Area, and to exercise such control over those activities as is necessary for the purpose of securing compliance with the relevant provisions of Part XI of UNCLOS and annexes, the rules, regulations and procedures of the ISA and approved plans of work.

In order to implement these regulatory responsibilities under UNCLOS the ISA will need to adopt fit-for-purpose environmental compliance assurance practices.

2.2 PURPOSE OF THIS REPORT

This report should be read in accompaniment with 'Assuring Environmental Compliance in Deep-Sea Mining: Lessons from Industry and Regulators – Case Studies' ('the Case Studies Report'), which provides background and details of practices adopted by industry (oil and gas and mining), national regulators, and international finance. Each case considers the key elements of environmental compliance assurance practices (see also Section 1.3 below):

- the institutional framework for compliance activities;
- compliance promotion;
- compliance monitoring;
- compliance enforcement;
- public reporting, accountability and transparency; and
- assessing the effectiveness of the practices.

This report provides an identification and analysis of practices and learnings for the above elements and seeks to apply them to the context for deep-sea mining (DSM) and the ISA. The main purpose of the report is to present a set of recommendations relating to environmental compliance assurance practices for the consideration of the ISA (although it should be noted that many recommendations could be relevant to the Contractors and Sponsoring States). The recommendations are based on the above-referenced work, together with the outcome of a Round Table Discussion by experts conducted on 3 and 4 September 2019.

The recommendations are presented in three categories as follows.

- **Recommendations in bold type are the key recommendations from this study and should be considered for being put in motion or implemented now.**
- Recommendations in normal type are matters which the ISA already has under consideration and/or intends to implement and/or are touched upon in the Draft Regulations on Exploitation. The purpose of these recommendations is to reinforce or introduce additional considerations and/or detail.
- *Recommendations in italics address matters which are likely to require increasing consideration by the ISA in the future as exploitation activity in the Area increases and becomes more widespread.*

While the recommendations made in this report focus on the exploitation phase many of them will also be relevant to compliance with the exploration regulations.

2.3 ENVIRONMENTAL COMPLIANCE ASSURANCE

Environmental compliance assurance is usually regarded as being made up of three linked factors: compliance promotion, compliance monitoring and compliance enforcement.²

- ‘*Compliance Promotion*’ includes activities aimed at supporting regulated parties (operating businesses, contractors, projects, etc) to comply with environmental performance requirements, regulations and standards by enhancing their awareness, knowledge and understanding of these requirements.
- ‘*Compliance Monitoring*’ includes activities to determine whether regulated parties are complying with the requirements, and which may include audits and other data gathering and monitoring efforts as a mix of self-monitoring, regulator/company inspection and independent /third party verification.
- ‘*Compliance Enforcement*’ includes the actions taken in response to detected or notified non-compliances.

The three main components of environmental compliance assurance are supported by:

- the ‘*Institutional Framework*’ or how an organisation³ is structured in terms of such matters as lines of accountability, roles and responsibilities, strategic planning, organisational capacity, training and overall staff capacity; and
- the extent to which organisations report around environmental compliance assurance and can be held to account by stakeholders (‘*Public Reporting, Accountability and Transparency*’).⁴

Lastly the overall effectiveness of environmental compliance assurance practices and how they are measured is an important consideration if continual improvement is to be achieved and an organisation is to be accountable for its performance.

From a regulator perspective, ‘enforcement’ usually entails sanctions (e.g. operational restrictions), financial penalties or even revocation of contracts/licences from an operator and can include criminal prosecution. Enforcement measures tend to be viewed as a last resort in well-developed environmental compliance assurance regimes. Adopting upfront measures for the prevention of non-compliance is preferable.

Environmental compliance assurance can therefore be briefly defined as the measures an organisation puts in place to provide itself and those it is accountable to with assurance that actions are being taken with the aim of a regulated party delivering the required environmental performance, through meeting standards, contractual conditions and adhering to relevant laws/regulations.

Typically, environmental compliance assurance will be part of an overall regulatory compliance assurance process operated by an organisation running alongside other processes such as safety compliance assurance, legal compliance etc.

2.4 STUDY METHODOLOGY

The accompanying Case Studies Report reviews the environmental compliance assurance practices of organisations with a broad geographic and sectoral coverage:

- national environmental and natural resource protection agencies in South Africa (Department of Environmental Affairs (DEA)), New Zealand (Environmental Protection Authority (EPA)), Hong Kong (Environmental Protection Department (EPD)), the Pacific Islands region (Parties to the Nauru Agreement (PNA)) and the United Kingdom of Great Britain and Northern Ireland (Marine Management Organisation (MMO));
- private sector companies (BP, Chevron, Shell and Rio Tinto); and
- international finance (European Bank for Reconstruction and Development (EBRD)).

It is worth noting that there are two aspects of environmental compliance assurance where private sector companies are concerned.

- At the facility level, the operating business is responsible for complying with laws, regulations and other environmental compliance requirements (and compliance may be facilitated and monitored by environmental personnel based in the facility). Environmental compliance assurance practices undertaken at the facility level could be regarded as analogous with those that would be undertaken by an ISA Contractor.
- At the corporate level, the board and shareholders require assurance that the laws, regulations and required environmental performance is delivered. Environmental compliance assurance practices undertaken by the corporate centre are more analogous with those of a regulator.

The organisations were selected based on the following criteria:

- as noted above, to provide a variety of types of organisations (regulator, industry and finance) that have developed environmental compliance assurance practices;
- geographic spread;
- cultural variation;
- marine activities or jurisdiction (but not exclusively so); and
- publicly available information (mainly on websites) in the English language.

Many other organisations with well-established environmental compliance assurance practices could have been added to the list; however, those eventually selected provided a manageable and balanced set of organisations.

The Case Studies Report, together with a provisional analysis of learnings, was circulated to a group of experts in advance of their participation in a Round Table Discussion. The Round Table Discussion agenda was based on the main themes of this report ('Compliance Promotion', 'Compliance Monitoring', 'Compliance Enforcement', 'Institutional Framework', 'Public Reporting, Accountability and Transparency', and 'Assessing Effectiveness') with a discussion of each theme and expert input to associated recommendations. Separate findings from the case studies as endorsed by the Round Table Discussion were also raised, and recommendations made on subjects outside the immediate environmental compliance assurance agenda. This report seeks to address these other matters to the extent practicable in Section 2, 'Underpinning Environmental Compliance Assurance'.

The participants in the Round Table Discussion are listed below.⁵

| Round Table Discussion Participant | Affiliation and Background |
|------------------------------------|---|
| Dr. Adam Cook | Formerly Head of Evidence at the UK Marine Management Organisation (the UK body regulating marine development and fisheries) and formerly Scientific Affairs Officer at the International Seabed Authority. |
| David Carlin | Science Director (Blue Growth), UK Centre for Environment, Fisheries and Aquaculture Science (CEFAS). CEFAS is an executive agency advising UK government bodies on the aquatic environment, biodiversity and fisheries. |
| Matthew Bateson | Formerly Head of Environment and Legacy Management, Rio Tinto, more than 20 years of experience in sustainability and external affairs issues in the international mining and oil and gas sectors, the latter with Shell. |
| Miguel Ruiz-Larrea | Formerly Global Social Performance Manager, Shell, 25 years of experience in dealing with environmental and social performance matters in South America, Europe and the Middle East. |
| Robert Coyle | Formerly Senior Environmental Adviser with European Bank for Reconstruction & Development (EBRD), more than 30 years of experience in environmental and social assessment across all the countries of Central & Eastern Europe and the former Soviet Union. |
| Ana Garzón | Formerly of ISEAL (International Social and Environmental Accreditation and Labelling) Alliance, providing specialist advice on assurance effectiveness and information management. |
| Bradley Soule | Chief Fisheries Analyst, OceanMind, providing expert advice on fisheries compliance and monitoring systems to governments and seafood buyers. |
| Renee Grogan | Environmental Consultant (Deep Sea Mining), formerly environment manager of Nautilus Minerals and currently providing specialist environmental and sustainability consultancy for terrestrial and deep-sea mining projects. |
| Dr. Kevin Murphy | Environmental Consultant (Deep Sea Mining), former Partner at Environmental Resources Management, leading EIA and related services in oil and gas, renewables and other marine sectors, including deep-sea mining. |

2.5 ORGANISATION OF THIS REPORT

As noted above, this report is supported by the Case Studies Report. This report contains the following sections:

- Section 2, Underpinning Environmental Compliance Assurance;
- Section 3, Institutional Framework;
- Section 4, Compliance Promotion;
- Section 5, Compliance Monitoring;

- Section 6, Compliance Enforcement;
- Section 7, Public Reporting, Accountability and Transparency;
- Section 8, Assessing Effectiveness.

In each section, the topics are broken down into sub-topics and tabulated. The tables include an initial indication of where particularly good practice may be found by highlighting a cell in dark green and providing a section cross reference to the Case Studies Report. General good practice is highlighted by pale green cells; some cells provide a section cross reference to the Case Studies Report where general good practice can be found. A blank cell indicates an absence of information or lack of detailed information from the review.

3 UNDERPINNING ENVIRONMENTAL COMPLIANCE ASSURANCE

3.1 INTRODUCTION

Environmental compliance assurance for deep-sea mining (DSM) is a process that cannot take place in isolation, as the starting point is to establish clear and activity-specific compliance requirements. It therefore needs to be underpinned by other activities and processes in addition to those matters introduced in Section 1.3 of this report.

3.2 ESTABLISHING COMPLIANCE REQUIREMENTS

3.2.1 General Considerations

The majority of compliance requirements for a project are set by a combination of the following: rules, regulations, procedures and standards; the outcomes of an Environmental Impact Assessment (EIA) process as set out in an Environmental Management and Monitoring Plan (EMMP); and, in some instances, additional corporate requirements of a private company (see Figure 1).

A similar process can be envisaged for DSM (see Sections 2.2.2.2 and 2.2.3.2).

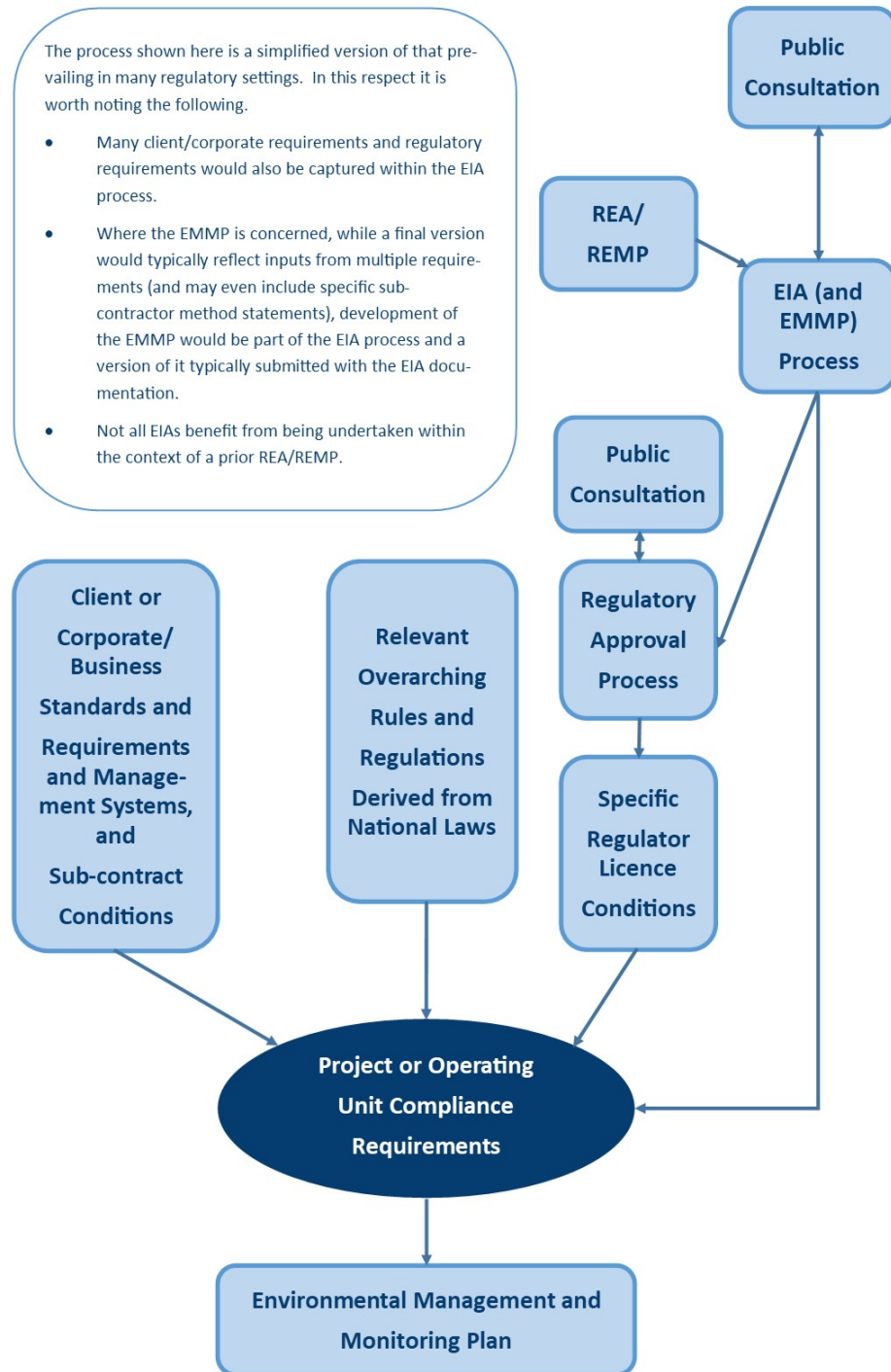
3.2.2 Rules, Regulations and Standards

3.2.2.1 Round Table Discussion Inputs

The environmental protection rules, regulations and standards of any regulatory regime determine the fundamental environmental compliance requirements for a project in development or in operation.

The Round Table Discussion noted that many private companies prefer a 'level playing field' based on strict standards as this can confer a competitive advantage on those who are equipped to meet the standards from the start. The Round Table Discussion also noted that in some regimes where standards are made stricter following a review, the revised standard is applied only to new operators rather than all and this undermines the level playing field, allowing poor environmental performance to endure longer than it would have if the stricter rules applied to all parties (also referred to as 'grandfathering' regulation).⁶

Figure 1 Setting Environmental Compliance Requirements



3.2.2.2 Context for DSM and the ISA

Currently the ISA imposes requirements upon its Contractors via the Regulations on prospecting and exploration,⁷ and an exploration contract (not made publicly available). There are also 'Recommendations for the Guidance of Contractors'⁸ issued by the ISA's Legal and Technical Commission (LTC), which Contractors are compelled to 'observe, as far as reasonably practicable' by the Regulations on prospecting and exploration. Contractors are also required to comply with the domestic laws of their Sponsoring State.

Regarding the exploitation phase for DSM, the ISA LTC has developed draft regulations (Draft Regulations on Exploitation)⁹ which are now with the ISA Council for review and negotiation. Draft Regulation 94 (Adoption of Standards) notes that the LTC will develop standards for the protection of the marine environment and put these to the Council for approval. Draft Regulation 94 notes that standards adopted by the Council will be legally binding on Contractors and the ISA and "*may be revised at least every 5 years from the date of their adoption or revision, and in the light of improved knowledge or technology*". In common with many other jurisdictions, the Draft Regulations on Exploitation also envisage quite widespread use by the ISA of non-binding 'Guidelines' documents. Each Contractor will also be required to operate in accordance with a Contract, approved by Council, which includes the Plan of Work specific to their project.

3.2.2.3 Recommendations

ISA Standards. *A full suite of environmental Standards should be adopted by the ISA, before Contractors commence exploitation operations. Following any periodic review of ISA environmental Standards and approval of revised ones, adoption of the revised Standard should be mandatory for all Contractors and not just for new entrant Contractors. An appropriate transition period should be allowed for existing Contractors to adopt the revised Standard.*

3.2.3 The Role of EIAs and EMMPs

3.2.3.1 Round Table Discussion Inputs

The Round Table Discussion noted that EIAs and EMMPs provide the leverage for regulators to ensure that compliance is addressed at the 'front end' of the project development process and add the project and site-specific environmental elements to environmental compliance assurance in addition to overarching requirements stemming from rules, standards and regulations.

The EIA and EMMP process is also a key step in building partnerships with stakeholders that can help to avoid potential future conflicts as well as identifying solutions in advance.

The Round Table Discussion also noted that most extractive industries raise public concerns over the risks of accidental events. Best practice in EIA is to assess the likelihood and potential consequences of unplanned events and accidents ('incidents') and present the control measures to avoid them or to reduce their likelihood and severity.

3.2.3.2 Context for DSM and the ISA

Regulation 47 and Annex IV of the Draft Regulations on Exploitation require that an ‘environmental risk assessment’ is undertaken. The term is not further explained but appears to be used in the context of shaping the main issues for the EIA to focus on. Identifying the main issues for an EIA to focus on is normally part of scoping and best practice in EIA is for scoping to include public consultation on such matters as the main issues for an EIA, the assessment methodologies and assessment criteria, among other matters.

Regulation 32 of the Draft Regulations on Exploitation (‘Risk of Incidents’) requires that a Contractor:

“shall 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, and taking into account the relevant Guidelines. The reasonable practicability of risk reduction measures shall be kept under review in the light of new knowledge and technology developments and Good Industry Practice, Best Available Techniques and Best Environmental Practices. In assessing whether the time, cost and effort would be grossly disproportionate to the benefits of further reducing the risk, consideration shall be given to best practice risk levels compatible with the operations being conducted.”

However, there are no mentions of assessing incidents and their environmental effects in the context of the EIA.

3.2.3.3 Recommendations

3.2.3.3.1 EIA Scoping Public Consultation

The EIA process for DSM projects should include a formal scoping phase and public consultation on the scoping report from which the terms of reference for completing the EIA (and EMMP) are developed. The process by which matters of focus for the EIA are decided should be transparent.

3.2.3.3.2 Assessment of Accidents and Unplanned Events and Control Measures

The EIA process for DSM projects should identify and assess the likelihood and potential consequences of environmental incidents so that the process of deciding on risk reduction methods to be adopted in the emergency response and contingency plan (forming part of the plan of work), including their costs, is a transparent one.

3.2.3.3.3 Quality of EISs and EMMPs

Due to their key role at the front end of environmental compliance assurance it will be important that all DSM Environmental Impact Statements (EISs) and EMMPs are of a consistent high quality. Where any parties undertaking EIA and EMMP work lack the necessary capacity to deliver an international class EIS and EMMP that can bear the reasonable scrutiny of international stakeholders, the ISA should require Contractors to ensure they are suitably supported (e.g. by ISA-sponsored capacity-building programmes) in bringing their work up to the international standard expected by the ISA. (It is understood that the ISA is currently in the process of developing standards for EIA/EIS and EMMP.)

3.2.3.3.4 EIAs, Cumulative Effects, and REMPs

The ISA should ensure that a Regional Environmental Assessment (REA) and robust Regional Environmental Management Plan (REMP) are available for a region in advance of Contractors undertaking their EIAs in order for the Contractors to be able to assess and put in place measures to manage their contributions to cumulative and regional scale effects on the marine environment and to align necessary elements of their EMMPs with the REMP.

3.3 CONTRACTOR AND CONTRACTING STATE CAPACITY FOR COMPLIANCE

3.3.1 Round Table Discussion Inputs

The Round Table Discussion noted that the capacity and willingness of regulated parties to comply with the relevant rules and standards are critical aspects of environmental compliance assurance for regulators. Many national regulators adopt risk assessment processes that include examining the capacity of regulated parties for compliance and to set their environmental compliance assurance focus accordingly.

3.3.2 Context for DSM and the ISA

Non-compliance has already been reported at the ISA (for example, with some Contractors failing to provide reports to the ISA in accordance with the specified formats or timescales prescribed).¹⁰ If such non-compliances were to be repeated during monitoring of actual exploitation activities, then the ISA would be unable to adequately fulfil its duties in environmental compliance assurance.

Although Annex III, Article 4 of UNCLOS concerning ‘Qualification of applicants’ refers to ISA applicants’ ‘financial and technical capabilities, it is not apparent the extent to which due diligence will be performed by the ISA on Contractors (under Regulation 13 of the Draft Regulations on Exploitation) in terms of their capacity to undertake operations to a required environmental standard and to develop and operate the management systems to support this. It is to be supposed that the process of undertaking an EIA and developing an EMMP will indicate the capacity of a Contractor to some extent. However, this will not remove the risk of a Contractor that has inadequate management capacity or a poor attitude to compliance proceeding into the early stages of exploitation. The possibility of Sponsoring States and Flag States with limited capacity would compound the risks to the ISA.

3.3.3 Recommendations

3.3.3.1 Review and Enhancement Measures Regarding Contractor Capacity for Environmental Compliance

The ISA should conduct due diligence and report upon the current group of Contractors to establish their compliance record during the exploration phase, along with their capacity for compliance and attitude towards it. The ISA should then focus its development programmes of workshops and other activities with Contractors (and possibly Sponsoring States) to enhance their capacity, for example starting with the EIA process. The results of the due diligence and the development programmes should be made public. The ISA should also provide guidance on its expectations of Contractors and Sponsoring States regarding their capacity for environmental compliance assurance. The same due

diligence approach should then be adopted for new parties seeking Contractor State status. Applications for Plans of Work (and annual reports) could also include a description of the legal and institutional framework and implementation capacities of the relevant authority within the Sponsoring State (which is not currently required).

3.4 STRATEGIC PUBLIC CONSULTATION

3.4.1 Round Table Discussion Inputs

The Round Table Discussion noted instances in other extractive (and energy) sectors of the benefits of undertaking early and widespread strategic consultation on certain matters (i.e. not related to a single project).

- Rio Tinto shaped and developed the policy elements of its biodiversity strategy through a collaborative process and the establishment of partnerships and consultation with leading international non-governmental organisations (NGOs).¹¹ Rio Tinto's biodiversity partners included BirdLife International, Conservation International, Earthwatch Institute, Fauna & Flora International and Royal Botanic Gardens, Kew.
- The Scottish Government undertook an investigation into unconventional oil and gas exploration and production ('fracking') within the government's jurisdiction. The investigation included a four-month public consultation, which received more than 60,000 responses.¹²
- The EBRD undertook public consultations in 2018 on the draft of its new energy sector strategy, with stakeholders from civil society organisations, industry and businesses invited to participate. Meetings were held in Istanbul, Warsaw, Almaty, London, Belgrade, Kiev and Casablanca.

3.4.2 Context for DSM and the ISA

The Round Table Discussion participants remarked that to date there has been little in the way of engagement with public interests at a strategic level regarding such matters as:

- the potential environmental impacts of seabed mining considered in the context of alternative methods for increasing metal supply or decreasing metal demand;
- the REMPs;
- EIAs produced for the exploration phase; and
- the institutional arrangements for exploiting the mineral resources while also protecting the marine ecosystem.

Participants felt the lack of this level of public engagement for DSM posed a risk to the ISA and a future DSM industry. One way in which the risk could become apparent is that the first Contractor to undertake the meaningful consultation that should occur in the EIA process will have to face questions on the above matters and others that it will be ill-equipped to answer. Further it would not be in the ISA's best interests for a Contractor to seemingly be taking the lead in answering to the public on issues that apply to DSM in general and not its own particular application. Early, proactive and thorough consultations led by the ISA may also mitigate the risk of future public interest litigation against the award of the first ISA exploitation contracts.

3.4.3 Recommendations

3.4.3.1 Strategic Public Consultation Programme

The ISA Member States should undertake a strategic level of engagement with ‘the public’ on matters that are beyond the scope of individual EIAs and designed to gauge the extent to which they are operating in the interests of all [hu]mankind. This should include the REMPs but could also address a strategic level above that in terms of the role of DSM in the wider context of meeting anticipated future demand for metals. The engagement should identify stakeholders; then inform, educate and obtain their views. Stakeholder groups might include research scientists, non-governmental organisations (NGOs), groups of countries with interests, potentially affected sea users (fisheries), indigenous peoples, youth etc. Different tools should be considered for different stakeholder groups.

4 INSTITUTIONAL FRAMEWORK

4.1 INTRODUCTION

The table below lists aspects and characteristics of an organisation's institutional framework in an environmental compliance assurance context and signposts the case studies that address these, indicating those that embody good practice. The section number references in the table are those for the Case Studies Report.

| | South Africa DEA | Hong Kong EPD | New Zealand EPA | MMO | PNA | Mining | Oil and Gas | EBRD |
|--|---------------------|------------------|--------------------|-------|-------|--------|-------------|-------|
| Accountability for environmental performance | | | | | | | | |
| Clear structure for governance | 2.2.1 | 3.2.1 | 4.2.1 | | | | 8.2.1 | |
| Clearly set out roles and responsibilities | | 3.2.1 | | | | | | 9.2.1 |
| Strategic planning for assurance | 2.2.2 | | 4.2.2 | | | | | 9.2.2 |
| Adequacy and transparency of funding | | | 4.2.3 | 5.2.3 | 6.2.3 | 7.2.3 | 8.2.4 | 9.2.3 |
| Staff resources, training and competencies/qualification | | | | | | 7.2.4 | | |
| Ring-fenced environmental management functions | | 3.2.5 | 4.2.5 | | | 7.2.5 | 8.2.6 | 9.2.5 |

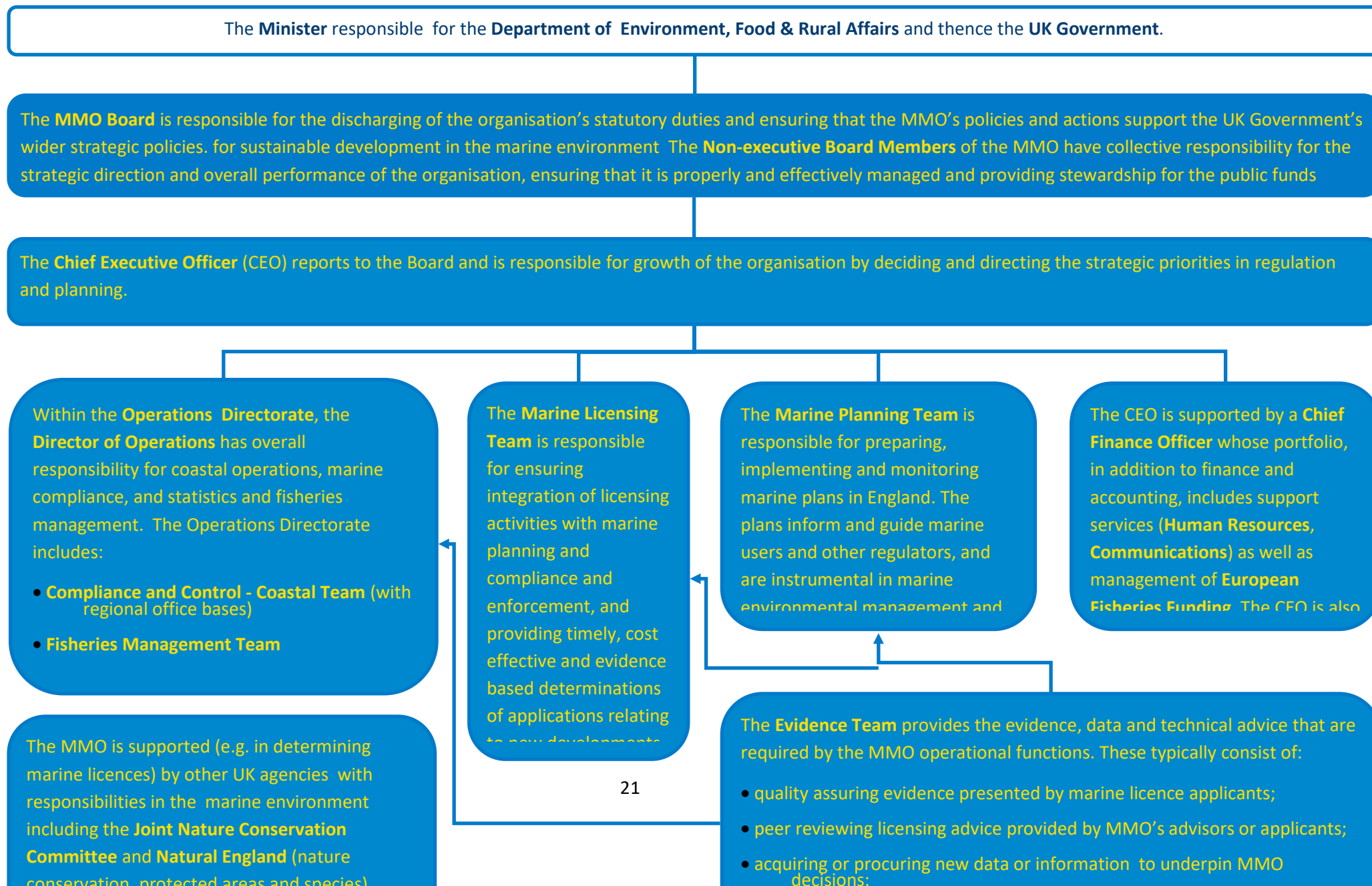
4.2 ACCOUNTABILITY FOR ENVIRONMENTAL PERFORMANCE

4.2.1 Learnings from the Case Studies

All the organisations covered in the case studies had clear lines of accountability for aspects of environmental compliance assurance (see Figure 2).

- For the government regulatory organisations, either a board or management function (e.g. chief executive officer, CEO) is accountable to a government minister for environment (or similar), and ultimately to the nation's citizens. In the case of the PNA (in the Pacific Islands region) the accountability to the public is via ministers of the countries that are party to the agreement.
- The private sector companies are accountable to a board director and/or board committee with an environmental/sustainability responsibility and thence to the shareholders. Through their compliance with the requirements of an environmental regulator they are also indirectly accountable to the citizens of the countries they are operating in.
- For EBRD the accountability is via the board to the shareholders made up of 69 nation states, the European Union and the European Investment Bank.¹³

Figure 2 **Structure of the Marine Management Organisation¹⁴**



4.2.2 Context for DSM and the ISA

The seabed of the Area and its minerals are ‘the common heritage of [hu]mankind’, and activities in the Area must be carried out ‘for the benefit of [hu]mankind as a whole’ (articles 136 and 140 of UNCLOS). Therefore, the ultimate accountability for the protection of the marine environment from harmful effects of seabed mining activities in the Area should be to all of humankind.

There are also accountabilities established within the organisational structure of the ISA (see Figure 3). All ISA bodies are accountable to the Assembly, which is the governing body of the ISA. The Assembly is made up of representatives of all countries that are signatories to UNCLOS. The Assembly is responsible for setting general policies and regularly reviewing the work of ISA. The national representatives on the Assembly are accountable to their governments and thence, in theory, to their nation’s citizens. However, the ways in which national governments are held to account by their nation’s citizens vary considerably around the world. There are also many governments that do not participate in ISA meetings, and others that are not signatories to UNCLOS.

Article 153, paragraph 4, of UNCLOS requires the Sponsoring States, in accordance with Article 139 of the UNCLOS to take “*all measures necessary to ensure*” compliance by the sponsored Contractor. Annex III, Article 4, paragraph 4, of UNCLOS goes on to clarify that the Sponsoring States’ “*responsibility to ensure*” applies “*within their legal systems*”. The Sponsoring States are therefore required to adopt “*laws and regulations*” and to take “*administrative measures which are, within the framework of its legal system, reasonably appropriate for securing compliance by persons under its jurisdiction*”. In the recent review contained in the ‘Comparative Study of the Existing National Legislation on Deep Seabed Mining’¹⁵ it is acknowledged that, while there are some commonalities (especially among the South Pacific states) there is also divergence in content and approaches taken. It can be expected that this divergence will continue at least into initial years of the exploitation phase, but with some potential for harmonisation as States draft and re-draft their rules.

Without UNCLOS, the ISA and the legal regime in place, any state could potentially exploit the resources under the freedom of the high seas in an unregulated manner. However, like all other inter-governmental organisations (IGOs) the ISA can only guide and influence the laws and regulations of nation states; it cannot dictate or enforce those laws.

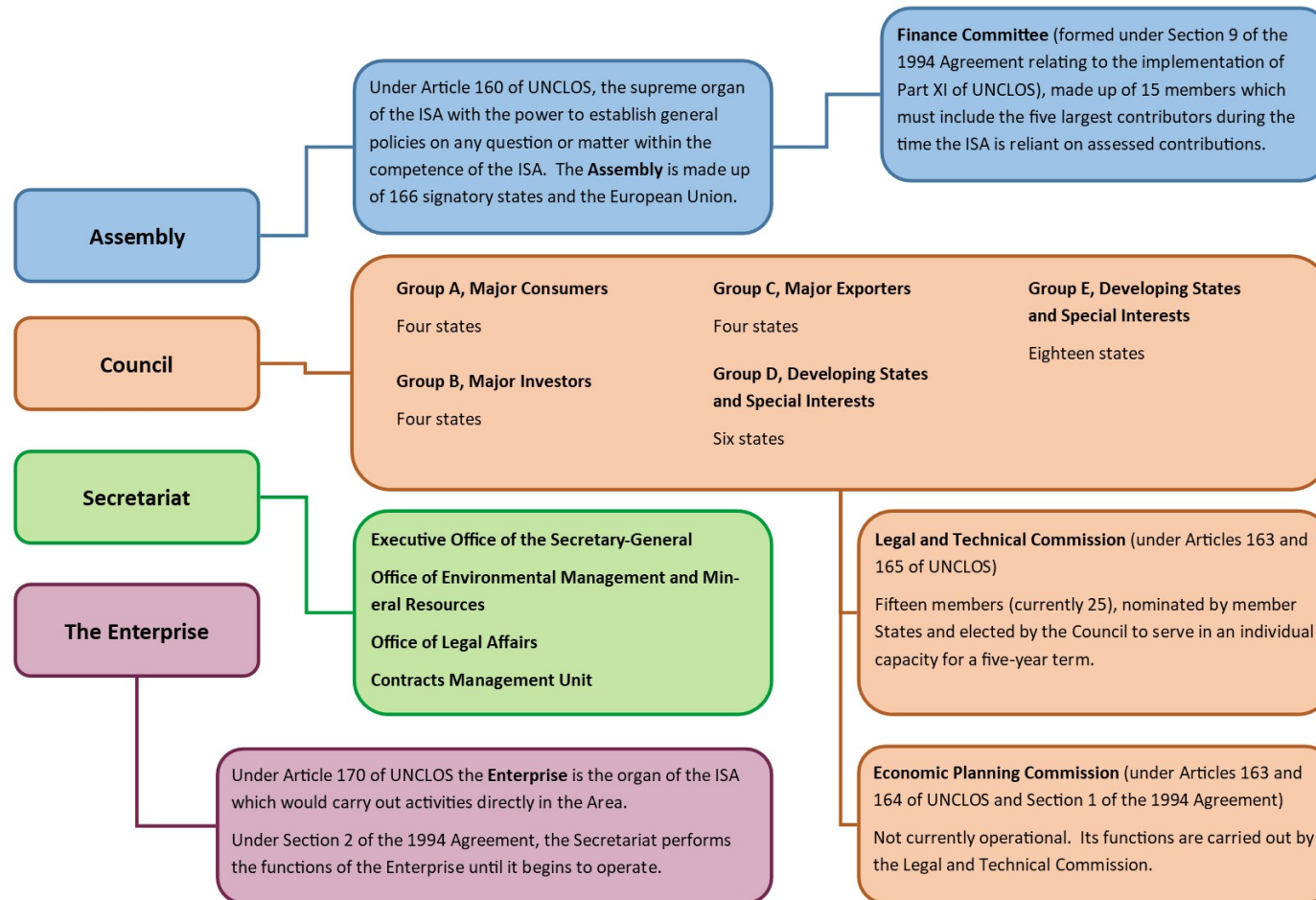
4.2.3 Recommendations

4.2.3.1 Accountability of the ISA to ‘All [Hu]Mankind’

The ISA should investigate formal mechanisms whereby it can be held to account by the elements of ‘[hu]mankind’ that are not currently represented by (ISA-engaged) signatories to UNCLOS, on the strategies it adopts for the protection of the seabed environment and its effectiveness in following the strategies. This would relate primarily to ongoing individual policy or regulatory decisions by the ISA. The adopted mechanism may require different approaches to formal consultations that primarily rely on engaging with state entities (be they governmental or non-governmental). One approach could be to expand the current observer base to include, for example, additional representatives from globally operating NGOs, international development charities, major faith groups, and international media organisations (including social media).

Figure 3

Structure of the ISA¹⁶



4.2.3.2 Accountability of Contractors and Sponsoring States

The ISA should ensure that its Regulations and Contract regime includes environmental compliance reporting measures whereby Contractors and Sponsoring States can be fully held to account by Sponsoring State citizens and ‘all [hu]mankind’. The public disclosure of compliance information should be made in way that allows sufficient time for participation and feedback and in a form that is appropriate for the general stakeholder. This may entail wider disclosure of Contractor performance and compliance information than is currently made publicly available or is intended to be provided in accordance with Draft Regulations 11 and 52.

4.2.3.3 Role of the Council

As can be seen from Figure 3, the Council has legal oversight of: ISA Contractors, the Enterprise, the Secretariat and the LTC. Recommendations are made elsewhere in this report regarding the ISA setting up an ‘environment department’ within its organisation; the Council should also have legal oversight for such a department.

4.3 CLEAR STRUCTURE FOR GOVERNANCE

4.3.1 Learnings from the Case Studies

The specific function of environmental compliance assurance within a governance structure stood out for the South Africa DEA and Hong Kong EPD. The Legal Authorisations and Compliance Inspectorate (South Africa) and the Environmental Compliance Division (Hong Kong) both had prominent positions within the overall structure. For the Hong Kong EPD, the environmental compliance assurance function is particularly prominent in the EPD structure with high level management responsibility and clearly set out roles.

The regulatory organisations all had governance structures in which administrative compliance functions are linked to and communicating with ministerial and bureaucratic policy makers, thus providing strong connections between policy and compliance actions (see also ‘Roles and Responsibilities’ below).

At least one international oil and gas company (IOGC) had a team within its central Health, Safety and Environment (HSE) function dedicated to environmental compliance assurance and all IOGCs and Rio Tinto cascaded environmental compliance assurance activities down through their organisations to their operating businesses.

4.3.2 Context for DSM and the ISA

The governance structure of the ISA is summarised in the text box below drawing on information provided at <https://www.isa.org.jm/authority> and illustrated in Figure 3.

Governance Structure and Roles of the ISA

The governing body of the ISA is the *Assembly*, which is made up of representatives of all countries that are signatories to UNCLOS. The Assembly is responsible for setting general policies, approving regulations and standards and regularly reviewing the work of the ISA. All the other ISA bodies are accountable to the Assembly.¹⁷

The *Council* is the executive body of ISA. It establishes specific policies, adopts regulations and standards (taking account of LTC recommendations) and approves applications for exploration or exploitation rights. Its members are elected by the Assembly for rotating four-year terms, and its makeup is designed to represent geographic regions, together with groups that have economic interests related to DSM (such as being major consumers, major current producers and significant investors in activities in the Area).¹⁸

The *Legal and Technical Commission (LTC)* advises the Assembly and Council.¹⁹ The LTC is a body of experts, nominated by member States and elected by the Council to serve in their individual capacity for a five-year term on the basis of personal qualifications relevant to the exploration, exploitation and processing of mineral resources, oceanography, economic and/or legal matters relating to ocean mining and related fields. The LTC is entrusted with various functions relating to activities in the deep seabed area including the review of applications for plans of work, supervision of exploration or mining activities, assessment of the environmental impact of such activities and provides advice to the Council on all matters relating to exploration and exploitation of non-living marine resources.

The *Finance Committee*²⁰ deals with budgetary and finance-related matters.

The *Secretariat*²¹ is one of the main bodies of the ISA and includes the following departments: Executive Office of the Secretary-General; Office of Environmental Management and Mineral Resources; and the Office of Legal Affairs. There is a training function providing support in coordinating capacity building programmes (e.g. through contractor training). There is also a communications and policy unit involved in communication and awareness building.

The Secretariat supports the deliberative and decision-making bodies of the ISA administratively (the Assembly, the Council, the LTC and the Finance Committee), and facilitates the implementation of the decision of these bodies. The Secretariat is headed by the Secretary-General.

The mandate, given to the Secretary-General, by UNCLOS, is: to be the chief administrative officer of the ISA, and to act in that capacity in all meetings of the Assembly, the Council and any subsidiary organ of the ISA; and to perform such other administrative functions as are entrusted to the Secretary-General by these organs.

The *Office of Environmental Management and Mineral Resources (OEMMR)*²² provides scientific and technical input into the development and implementation of the rules, regulations and procedures for the conducting DSM and related activities in the Area.

OEMMR also supports the development and implementation of regional environmental management plans (REMPs), EIA, environmental monitoring and the development of environmental standards and guidelines. The OEMMR is also responsible for such matters as:

- the development and maintenance of information technology facilities, including the development and maintenance of ISA's global database;
- the collection, analysis and dissemination of geological, biological, environmental and technological data and information on the Area and its resources;
- producing and distributing publications on the work of the Authority and monitoring trends and developments of deep seabed mining activities; and
- promoting and encouraging the conduct of marine scientific research in the Area by developing collaborations with member States and international organisations.

The *Office of Legal Affairs (OLA)*²³ is the central legal service of the Secretariat and provides legal advice to the Secretary-General, the Secretariat and the other principal organs of the Authority and their subsidiary bodies. It represents the Secretary-General in legal conferences and in judicial proceedings. There is also a Contracts Management Unit (CMU) which was established as a precursor to a future compliance / inspection unit.²⁴

The *Enterprise* is the ISA body which, once brought into operation, would enable the ISA to carry out mining activities in the Area directly, together with transporting, processing and marketing the extracted minerals.²⁵ The *Enterprise* is also envisaged to facilitate the participation of developing States in DSM.

Some responsibility for environmental matters sits with the LTC. For example, the LTC is responsible for reviewing Contractor EIA reports and the LTC also receives Contractors' annual reports. In both cases, where concerns are identified, the LTC communicates these concerns back to the Contractor (via the Secretariat) and should flag these points in its report to the Council. However, it should be noted that currently environmental expertise is only a small part of the makeup of the LTC (although the overall composition of the LTC is under review). Responsibility for certain environmental matters also sits with the OEMMR. The role of 'Inspector' is described in the Draft Regulations on Exploitation and discussed further in a note by the Secretariat;²⁶ while their work will address environmental compliance matters it will not do so exclusively.

The Council also has key roles associated with environmental compliance assurance.

- Under Article 162 2. (z) the Council has powers to *"establish appropriate mechanisms for directing and supervising a staff of inspectors who shall inspect activities in the Area to determine whether this Part, the rules, regulations and procedures of the Authority, and the terms and conditions of any contract with the Authority are being complied with"*.
- Recommendations to approve or to not approve plans of work are made by the LTC to the Council. The ultimate decision is made by the Council on the basis of a supermajority (of two-thirds) in each of all four of its chambers.²⁷
- The Council exercises control over other matters of substance for various activities, including deliberating over and enforcement of non-compliance with a contract or ISA rules. The Council decision in such circumstances requires a supermajority (of three-fourths) in each of all four of its chambers.

It is worth noting that a Council decision could be stymied by just one of its chambers.

At this present stage the ISA does not have a dedicated environment department that includes an environmental compliance assurance function.

4.3.3 Recommendations

4.3.3.1 *Environment Commission*

Under its powers and functions set out in Article 162 (part 2, (d)) of UNCLOS, the Council should consider setting up an Environment Commission on an equal footing with the LTC and which assumes the current roles of the LTC with regard to environmental matters as set out in Article 165 of UNCLOS. Alternatively, in the absence of a future Environment Commission, the Council should ensure that the environmental capacity within the LTC is aligned with the level of environmental responsibility set out under Article 165.

4.3.3.2 *Dedicated Environment Department*

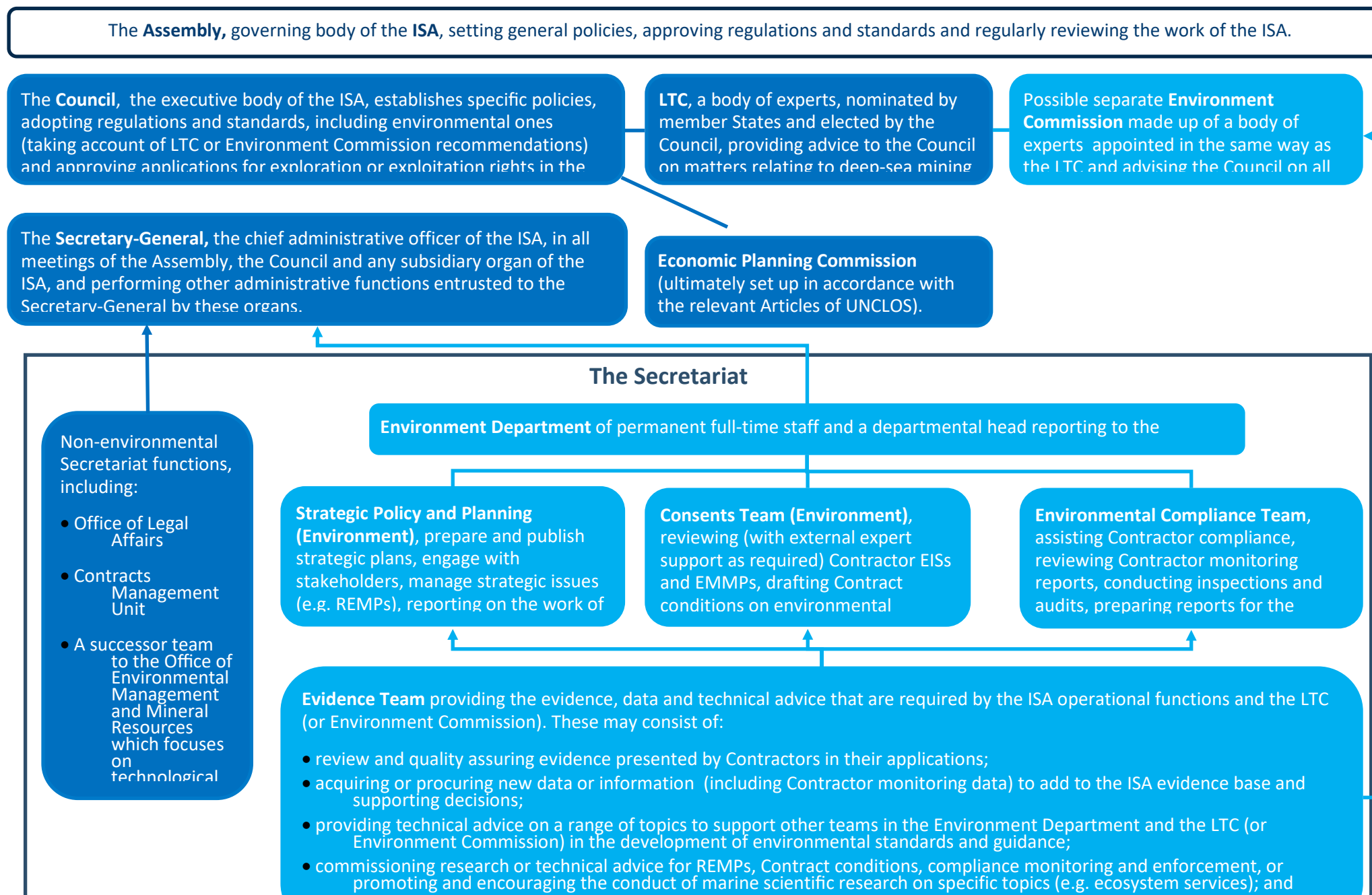
The ISA should set up a dedicated 'environment department' within the Secretariat reporting via the Secretary-General to the Council. The environment department would support and advise the LTC (or Environment Commission) regarding all environment-related matters, including the review of plans of work by a 'consents team' (or similar). The environment department would include the current environmental roles of the OEMMR (such as environmental data management,

development of environmental guidance, REMPs). The environment department would also include an environmental compliance assurance function. The environment department should be structured such that its various functions (including compliance) are linked to and communicate with higher level decision-makers and bureaucratic policy makers, thus providing strong connections between policy and compliance actions on environmental matters. Figure 4 sets out a possible structure and how it fits into the wider ISA organisational set up.

4.3.3.3 Environmental Compliance Assurance Team

The ISA's environment department (or similar) should include a team that is dedicated to environmental compliance assurance, particularly the compliance monitoring and compliance enforcement elements. Suitable qualified staff to address the environmental elements of inspection activities would be drawn from this team.

Figure 4 Possible Structure for the ISA with an Independent Environment Department Reporting to the Secretary-General²⁸



4.4 CLEARLY SET OUT ROLES AND RESPONSIBILITIES

4.4.1 Learnings from the Case Studies

In those organisations reviewed in the Case Studies Report, the roles and responsibilities of the teams or functions involved in environmental compliance assurance activities were generally clear and reasonably well-focused. The Hong Kong EPD and the EBRD provide greatest clarity in terms of individual roles and responsibilities in the process, and for the EBRD how these relate to other functions such as finance and legal.

For the Hong Kong EPD there are very clear reporting lines in terms of the relationship of those involved in environmental compliance assurance to centralised environmental regulatory responsibilities and the administrative/government hierarchy which can be summarised as follows:

- Assistant Director of Environmental Protection (Environmental Compliance) reports to;²⁹
- Deputy Director of Environmental Protection (1) reports to;³⁰
- Permanent Secretary for the Environment/Director of Environmental Protection reports to;³¹
- Secretary for the Environment reports to;³²
- Chief Executive of the Hong Kong Special Administrative Region.

The Case Studies Report provides more detail on the main duties and responsibilities of the first three individuals listed above.

4.4.2 Context for DSM and the ISA

Under the Draft Regulations on Exploitation, the Council will establish mechanisms for inspection, covering the monitoring and enforcement activities of ISA inspectors, and the Inspectors will make their reports to the Secretary-General. The Secretary-General will make annual reports to the Council and also escalate serious non-compliances requiring enforcement action to the Council. It should be noted that the Inspectors' role as envisaged includes environmental compliance alongside a range of other matters.

4.4.3 Recommendations

4.4.3.1 Environmental Compliance Assurance Roles and Responsibilities

The ISA should establish an environmental management organisation ('environment department') that includes an environmental compliance assurance team. The roles and responsibilities and lines of communication of all those involved in environmental compliance assurance (from front line auditing and inspection to decision-makers on enforcement to those setting compliance strategies and overall policy) should be clearly established and published.

4.4.3.2 Environmental 'Inspectors'

Environmental auditing and inspection should be undertaken only by qualified and experienced environmental auditors.

4.5 STRATEGIC PLANNING FOR ASSURANCE

4.5.1 Learnings from the Case Studies

While all the organisations studied adopted some form of strategic planning, the South Africa DEA, the New Zealand EPA and the EBRD all stood out in terms of adopting a rolling multi-year look ahead

that is made public and feeds into annual assessments of performance, including reviewing the effectiveness of environmental compliance assurance practices and activities.

- The DEA annually publishes Strategic Plans/ Annual Performance Plans setting out the strategic objective, objective statement, baseline (for the current year), performance indicators and targets (four years ahead for the Strategic Plans) for each of its programmes including for the Legal Authorisations and Compliance Inspectorate.
- The New Zealand EPA's annual report is underpinned by an annual 'Statement of Performance Expectations', which provides detail on performance versus targets set out in a performance framework. The performance framework links EPA's activities in any one year with longer-term outcomes relating to the EPA's strategy for Monitoring and Enforcement (and other matters).³³
- The EBRD publishes strategies for the four years ahead for each of its focus sectors and each country it operates in.³⁴ While these are not directly focused on environmental compliance assurance, they do set out how the bank will measure its performance.

Best practice in strategic planning (of environmental management and regulation) appears to be essentially a combination of:

- a 'strategic plan' covering the next 4 to 5 years that is refreshed annually;
- an 'annual performance plan' setting out actions for the coming year that are aligned with delivering the outcomes set out in the strategic plan and containing key indicators that the organisation's effectiveness can be reviewed against (on an on-going and end of year basis);
- specifically including environmental compliance as a subject of the strategic plan and the annual performance plan; and
- inviting stakeholder input to the development of the plans.

4.5.2 Context for DSM and the ISA

The ISA Assembly has recently adopted a 'Strategic Plan of the International Seabed Authority for the Period 2019–2023'.³⁵ The Strategic Plan acknowledges that adopting a policy and regulatory framework for environmental management that achieves the effective protection of the marine environment has a number of challenges that include the following.

- The exploitation phase for DSM will begin under circumstances of considerable scientific, technical and commercial uncertainty.
- The regulatory framework will need to be adaptive, practical and technically feasible, while at the same time satisfying the marine environmental protection requirements of UNCLOS (as well as taking account of relevant aspects of the Sustainable Development Goals and other international environmental targets, such as the Aichi Biodiversity Targets, that the ISA has committed to).
- The process for developing the framework and its implementation will need to be transparent and allow for stakeholder input, particularly during the development of regional environmental assessments and management plans (REAs and REMP), together with requiring a collaborative and transparent approach to both the collection and sharing of environmental data.
- The process will need to include the active participation of developing States, alongside clear actions designed to build their technical capacity.

Consideration of the above factors (and others) leads to the setting of a series of 'Strategic Directions'. From the perspective of environmental compliance assurance, the key Strategic Directions include ones that address:

- strengthening the regulatory framework to take in best practices in environmental management (Strategic Direction 2.2) and employ the concept of adaptive management in the evolution of rules and regulations (Strategic Direction 2.3); and
- protecting the marine environment taking into account adaptive management (Strategic Direction 3.1), developing REAs and REMP's (Strategic Direction 3.2), public access to environmental information (Strategic Direction 3.3) and the development of "scientifically and statistically robust monitoring programmes and methodologies to assess the potential for activities in the Area to interfere with the ecological balance of the marine environment" (Strategic Direction 3.4).

The strategy then goes on to set out the 'Expected Outcomes' which includes:

(a)(i) Effective protection for the marine environment.

The development of a guideline for adaptive management is also proposed by the ISA.

For DSM one desired environmental outcome will be to leave a properly functioning marine ecosystem (at some defined regional scale) behind at the end of mining activity (within that region). However, the Regional Environmental Assessments (REAs)/REMP's and individual EIAs produced ahead of the commencement of mining, while predicting that DSM activity should be sustainable, may contain a degree of uncertainty over such a longer-term outcome. The uncertainty could, for example, derive from lack of knowledge on how key elements of the ecosystem may respond to DSM or difficulties in predicting the cumulative effects of DSM. While the level of uncertainty may be insufficient to disapprove Contracts, the fact of its existence would not allow DSM to proceed for several decades based on conditions set once at the Contract approval stage. This is one area in which adaptive management will come into play.

The use of adaptive management approaches to address uncertainty will raise challenges for an environmental compliance assurance system since there is unlikely to be a clearly defined rule, regulation or standard against which to assess compliance. Nevertheless, the ISA will require assurance that where an adaptive management process has been agreed as part of a Contract:

- the process is being implemented as agreed; and
- it is demonstrably progressing towards the desired environmental outcome, or an adjustment is required.

The latter point raises particular challenges in circumstances where, for example, the desired outcome may be a fully functioning marine ecosystem thirty years hence: what would compliance (or non-compliance) look like at say five-yearly review intervals? For a robust environmental compliance assurance process, it will be necessary to establish interim outcome objectives and review adaptive management progress against these.

4.5.3 Recommendations

4.5.3.1 Strategic Compliance Plan and Annual Performance Plan

The ISA should further develop its strategic approach to environmental management and regulatory activities to include greater detail regarding the following:

- developing a 'strategic environmental compliance plan' covering the next 5 years and refreshing it annually based on reviews of performance;
- developing an 'annual performance plan' setting 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);
- reporting to the Council against that plan and those indicators; and
- consulting all stakeholders, including Contractors, in the development of the plans.

4.5.3.2 Adaptive Management Approaches

Adaptive management will play an important role in the environmental management of DSM activities, and this could raise challenges to aspects of the environmental compliance assurance process. The ISA should carefully define the parameters of adaptive management in the environmental management of DSM activities in the form of clear guidelines to Contractors and its own environmental compliance team. The ISA should include processes for science-based goal setting and periodic reviews in developing its adaptive management guideline so that progress towards planned outcomes can be robustly monitored and compliance demonstrated. The environmental compliance assurance process must then include measures to support and accommodate this approach. The ISA could, for example, in developing its adaptive management guideline, include a process for developing interim objectives towards a long-term desired outcome so that compliance with the interim objectives can then be effectively monitored and reported on at periodic intervals.

4.6 ADEQUACY AND TRANSPARENCY OF FUNDING

4.6.1 Learnings from the Case Studies

Funding models for environmental compliance assurance activities are varied and it would be inappropriate to pick out any one model as best practice.

- The MMO and New Zealand EPA both draw funding from national government treasuries but also charge for processing licences and other activities associated with compliance.
- The PNA draws funding directly from the revenues obtained from the activity it regulates.³⁶
- Oil and gas and mining companies tend to hard-wire the cost of environmental compliance assurance into their operating business budgets and central costs.
- Project proponents seeking loans from the EBRD pay towards the cost of environmental compliance assurance activities undertaken by EBRD from their loans.

The majority of the models include a component of their funding that is drawn directly from the regulated parties. This is generally seen as reasonable on the basis that the bigger and more complex a project or activity is then the more attention and value it gets from the regulator.

4.6.2 Context for DSM and the ISA

Currently the ISA charges an application fee of \$500,000³⁷ and on award of Contract an annual fee of \$60,000³⁸ and is otherwise funded by annual calculated contributions from member States.

The Draft Regulations on Exploitation set out a 'schedule of annual, administrative and other applicable fees' (Appendix II) and explains the arrangements for payment of fees by exploitation Contractors in draft Regulations 84 to 88. Fees are aimed at covering the ISA's administration costs

relating to a Contract and these are assumed to include such matters as reviewing EIAs and EMMPs, together with the ISA's own environmental inspection and enforcement actions.

Since there will be some variation in the types of DSM activity (nodules, sulphide and crusts) projects are likely to vary significantly in scale and complexity and it is assumed this will be addressed in the fee arrangements to be set in the future.

Draft Regulation 103 makes provision for imposition of monetary penalties on Contractors as a possible compliance enforcement action. It is unclear whether that money could be used to fund ISA operational costs.

4.6.3 Recommendations

4.6.3.1 Adequacy of General Funding

The ISA should ensure that in calculating specific fees charged to Contractors and other funding contributions, the amounts set are adequate to provide the following (although not necessarily limited to):

- competitively remunerated staff of the required competencies and experience, possibly distributed in regional offices (e.g. Asia-Pacific region, Southern Africa/Indian Ocean region etc);
- staff training and development programmes, including capacity building in environmental management and environmental compliance assurance;
- preparation of environmental compliance promotion materials and development of evidence-based material (see also Sections 4.4 and 4.5);
- environmental data management and dissemination;
- the implementation of significant outreach programmes (see also Section 4.7);
- the ad hoc use of external marine environment experts; and
- external verification and review of the performance of the environment department and the environmental compliance assurance team.

4.6.3.2 Charging for the ISA's Planned Environmental Compliance Assurance Activities

The ISA should ensure that its planned environmental compliance assurance activities (as set out in a strategic compliance plan) are fully factored into the fee structure for Contractors, or other fundraising mechanisms.

4.6.3.3 Charging for Additional ISA Environmental Compliance Assurance Activities

The ISA should ensure that it is able to recover its costs from Contractors that are non-compliant for taking regulatory actions to address their non-compliance (for example increasing the frequency of audits and inspections for a Contractor who has previously been non-compliant, will also increase costs to the ISA).

4.6.3.4 Monetary Penalties

The ISA should not use or rely on monetary penalties levied on Contractors as a source of funding environmental compliance assurance activities. Environmental compliance assurance activities should be planned each year in advance and funds secured accordingly. Monetary penalties (if any) would be unpredictable and intermittent.

4.7 STAFF RESOURCES, TRAINING AND COMPETENCIES/QUALIFICATION

4.7.1 Learnings from the Case Studies

The Case Studies Report indicated there are three main aspects to staffing: (i) adequate funding to have sufficient staff resources and the ability to augment internal resources with external ones; (ii) appointment of competent qualified staff; and (iii) investment in staff through proper management and training.

Funding for national regulators is inevitably linked in some way to a country's economic performance combined with how importantly the country views protecting its environment and natural resources.

Common to all the organisations reviewed in the Case Studies Report, the staff involved in environmental compliance assurance and environmental management/regulation are appointed in full-time roles from a national/regional/global pool of suitably qualified environmental professionals. Their positions are generally permanent with professional development and training provided, along with the opportunity to advance through their respective organisations. In the private sector and the EBRD, staff, particularly junior staff, are encouraged and given the opportunity to rotate around the organisation and gain new experiences.

The EBRD has a London headquarters office, however its environmental compliance capacity is regionally distributed across the countries it operates in.³⁹

4.7.2 Context for DSM and the ISA

Although DSM resources are represented in all the world oceans and ultimately Contractors could be drawn from all over the world, currently ISA staffing is mainly made up of full-time Secretariat staff based in Jamaica, as well as delegations to the Council and appointees to the LTC who attend the ISA headquarters in Jamaica for a few days each year.

Council delegations tend to be staffed by foreign affairs officials and the LTC has a five-year term of appointment, so personnel are rotated out on a periodic basis.⁴⁰

4.7.3 Recommendations

4.7.3.1 Staff Recruitment

The ISA should recruit staff into full-time permanent roles for an 'environment department' and 'environmental compliance assurance team' from its existing qualified staff and a global pool of suitably qualified environmental professionals, including personnel with a suitable industry sector background (e.g. offshore oil and gas) or a marine regulatory background. In the absence of an 'Environment Commission', the LTC should include a specific proportion of experts with environmental management and compliance enforcement backgrounds.

4.7.3.2 Staff Development

As part of its overall approach to staff training and development, the ISA should establish clear processes for the development and career advancement of its environmental management and environmental compliance assurance personnel (at all levels from front-line delivery to senior management) that includes formal training and capacity building.

4.7.3.3 Staff Location

In order to broaden the appeal of the ISA as a place to develop a career and to facilitate capacity building in signatory states, and as the industry extends its footprint in years to come, the ISA should consider setting up regional environment departments (e.g. in southern Africa/Indian Ocean region and Asia-Pacific) in addition to its Jamaica headquarters and/or 'remote working' practices that take advantage of modern information and communication technology.

4.8 RING-FENCED ENVIRONMENTAL MANAGEMENT FUNCTIONS

4.8.1 Learnings from the Case Studies

The Case Studies Report indicated that the function of the regulatory organisations is usually ring-fenced from other government limbs by the primary focus of the organisation and its mandate for protecting the environment and while a regulatory organisation may contribute to policy development, the policy-maker itself is separate from the regulator (and thence from regulated parties). The MMO and the South Africa DEA are partial exceptions to this in that some extractive industries have been exempted from their mandates and instead have their project development proposals and operational environmental performance regulated by other government agencies: Department for Business, Energy & Industrial Strategy for oil and gas in the UK and the Department of Mineral Resources and Energy for mining in South Africa. However, it should be noted that within their respective remits they can still be regarded as having environmental management functions that are independent of other government and regulatory functions.

The IOGCs and Rio Tinto clearly separate their environmental management functions from operating business management and pursuit of opportunities/development of new projects; however, the function is often combined with safety (which can arguably detract from a full environmental focus).

Although the PNA could be viewed as promoting fishing, receiving revenue from it and regulating it all within one administration (albeit spread across the member states), its context is important: the overriding objective to manage a sustainable fishery such that all the islanders of the member states can benefit equally now and in future years.⁴¹ The strong commitment to this overall objective of the PNA appears to overcome any possible conflict between its different functions.

4.8.2 Context for DSM and the ISA

At this present stage the ISA does not have a single dedicated environment department that includes an environmental compliance assurance function, and which is entirely separated from, and independent of, other functions.

Responsibility for matters related to environmental management are divided between:

- the Council, which is the decision-maker for compliance action (see also Section 3.3.2);
- the LTC, which is predominantly focused on legal and technical mining matters, although it does include an environmental working group, with a small number of experienced scientists;
- the OLA, which contains the contract management unit; and
- the OEMMR, which also addresses technical and resource matters alongside environment.

The Draft Regulations on Exploitation make provision for Inspectors, whose role will include environmental compliance assurance among other matters of compliance (i.e. not exclusively environmental). The Inspectors will report to the Secretary-General.

The Sponsoring States with mature environmental policies, laws and regulations will have dedicated environmental regulators that are independent of other government functions including economic development; for some Sponsoring States this may not be the case. However, this does not mean that those regulators (a) have been given jurisdiction and powers (under national laws) to act in relation to activities in the Area, and (b) have experience of offshore extractive industries, especially DSM.

Currently there are 30 exploration contracts in place (18 for polymetallic nodules, 7 for polymetallic sulphides and 5 for cobalt-rich ferromanganese crusts); each contract is for 15 years with possible extension. Some exploration contracts have been in place since 2001 (and these have been extended), although most are more recent (post 2010). According to regulation 6 of the Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area (and the corresponding regulations for polymetallic sulphides and cobalt-rich ferromanganese crusts),⁴² under the exploration contracts, Contractors are required to report annually on the progress of their prospecting activities and of the results obtained, together with information on their compliance with their Contract. Under regulation 7, the reports are confidential, other than “*data and information relating to the protection and preservation of the marine environment, in particular those from environmental monitoring programmes*”. Such data can, however, be kept confidential for up to three years. Two Contractors have published EIAs for their exploration programmes.⁴³ As they are presently constituted, and although they do have environmental and compliance obligations under their exploration Contracts, it is unclear the extent, if any, to which any Contractors have environmental management divisions and environmental compliance assurance functions within their organisations.

Looking ahead to the exploitation phase, assuming ISA Contractors adopt operational management systems that are similar to those used by international oil and gas and mining companies, they are expected to contain an environment department and environmental compliance assurance function with a reporting route directly to a board of directors or equivalent.

Lastly, the Enterprise as an organ of the ISA that could also conduct mining operations, will need to comply with environmental requirements in the same way as a Contractor, and therefore be regulated accordingly.

Therefore, the ISA as an organisation (albeit made up of distinct organs) can set environmental policy, act as an environmental regulator and conduct mining.

4.8.3 Recommendations

4.8.3.1 Independent Environment Department

As stated in Sections 3.3.3.2 and 3.3.3.3, the ISA should set up a dedicated environment department that includes an environmental compliance assurance team to regulate the activities of the Contractors and the Enterprise. The department should be entirely independent from and

minimally influenced by other ISA bodies and have its own mechanism of reporting, via the Secretary-General, to the Council and Assembly.

5 COMPLIANCE PROMOTION

5.1 INTRODUCTION

The table below lists aspects and characteristics of an organisation's approach to compliance promotion and signposts the case studies that address these, indicating those that embody good practice. The section number references in the table are those for the Case Studies Report.

It is worth noting that compliance promotion has different objectives depending on the nature of the organisation.

- With the national regulators it is aimed at the regulated community.
- With the private sector it is aimed at the operating line and Contractors (and to some extent a 'social licence to operate').
- With international finance it is aimed at borrowers.

It is also worth noting that while compliance promotion is divided into various aspects below, in terms of overall best practice it should be considered as a whole, i.e. awareness raising plus guidance plus evidence plus accessibility plus outreach plus incentives.

| | South Africa DEA | Hong Kong EPD | New Zealand EPA | MMO | PNA | Mining | Oil and Gas | EBRD |
|--|---------------------|------------------|--------------------|---------|-----|---------|-------------|---------|
| Processes for raising awareness (of standards, policies, procedures, guidance etc) | | 3.3.2.1 | 4.3.2.1 | | | 7.3.2.1 | 8.3.2.1 | |
| Availability and accessibility of guidance | | 3.3.3.1 | | | N/A | | | |
| Provision of guidance (industry, company, activity specific) and indicating good/best practice | | 3.3.2.3 | | | N/A | | | 9.3.2.3 |
| Provision of evidence material and knowledge in general | | | | 5.3.2.2 | N/A | | 8.3.2.2 | |
| Use of web-based and interactive tools | 2.3.3.2 | | | 5.3.3.2 | N/A | 7.3.3.2 | 8.3.3.2 | |
| Outreach activities (seminars, conferences, training) | | | | | N/A | | | 9.3.3.3 |
| Use of incentives | | | | 5.3.4.2 | N/A | 7.3.4.1 | 8.3.4.1 | 9.3.4.3 |

5.2 PROCESSES FOR RAISING AWARENESS

5.2.1 Learnings from the Case Studies

Nearly all the organisations reviewed in the Case Studies Report provide materials on their websites aimed at raising awareness of environmental performance and compliance matters. The PNA is an exception, conducting its awareness raising through the licensing system that all fishing vessel operators are required to go through⁴⁴.

Providing material on websites is helpful in raising awareness; however, the additional proactive practices of some organisations are worth noting. Outreach activities and other mechanisms are deployed in addition (and discussed further in Section 4.7).

- Users of the Hong Kong EPD website are directed to ‘Compliance Assistance’ from the home page and thence to the ‘Compliance Assistance Centre’, which is proactive and helpful in promoting compliance to the regulated community⁴⁵.
- The New Zealand EPA has developed an ‘EEZ Compliance Engagement Strategy and Plan’ for its engagement process with the regulated community, which is aimed at making sure people and organisations are being targeted with an appropriate level of engagement⁴⁶.
- In the private sector, companies set out their expectations of all staff on matters from safety to ethical behaviour, and including environmental performance, in Codes of Conduct or similar. These materials are mandatory reading and direct the reader to further information including standards and guidance. Although there is an especially strong focus on safety, a health, safety and environment culture is embedded from the top of the organisations and at all levels.

Industry associations exist for the international oil and gas industry and terrestrial mining (International Association of Oil and Gas Producers (IOGP)⁴⁷, the International Petroleum Industry Environmental Conservation Association (IPIECA)⁴⁸ and the International Council on Mining and Metals (ICMM)⁴⁹) and they play an important role in raising awareness of environmental issues for their respective industries as well as developing standards, providing guidance and making evidence-based material available.

5.2.2 Context for DSM and the ISA

DSM is a new industry with effectively no precedents for managing some of its environmental effects. In contrast there are precedents in, for example, the deep-water oil and gas sector for health and safety management. Environmental leadership will be required from the ISA, the Sponsoring States and within the Contractor organisations from the outset of planning for exploitation.

DSM activities are not currently addressed by an industry organisation in the way that terrestrial mining and oil and gas are.

5.2.3 Recommendations

5.2.3.1 DSM Industry Association

The ISA should encourage Contractors (and Sponsoring States) to set up an industry association for DSM that provides similar functions and services to those of the International Association of Oil and Gas Producers (IOGP), the International Petroleum Industry Environmental Conservation Association (IPIECA) and the International Council on Mining and Metals (ICMM). Alternatively,

the ISA could open dialogue with the ICMM regarding that organisation expanding its role to include DSM. Such an organisation could provide a vehicle for such matters as developing codes of conduct, codes of practice and various guidance for DSM activities.

5.2.3.2 Enterprise Code of Conduct

In the absence of a suitable industry association, the ISA, on behalf of the Enterprise, should prepare a Code of Conduct which: addresses the importance of sustainable DSM and environmental compliance; demonstrates the Enterprise's commitments from the highest levels in the organisation; sets out the expectations placed on all staff; and directs staff to further information including standards and guidance. While commitments to safe operations at all times are expected to be an integral aspect of a Code of Conduct (and systems and practices stemming from it), it is important that environmental performance and sustainability are clearly given equal prominence and importance.

5.2.3.3 Contractor Codes of Conduct

The ISA should require Contractors (and encourage Sponsoring States) to prepare Codes of Conduct which are modelled on that prepared for the Enterprise (or prepared by an industry association).

5.3 AVAILABILITY AND ACCESSIBILITY OF GUIDANCE

5.3.1 Learnings from the Case Studies

As noted above, all the organisations reviewed in the Case Studies Report provide guidance and compliance-related materials on their websites. The accessibility of guidance material is variable, with many requiring some effort to find, either by navigation around the home page and drop-down links or by using search functions.

The Hong Kong EPD website is the main exception with access to guidance material readily achieved from the home page either via drop-down link selections for each of its six programme areas and via the 'Compliance Assistance' drop-down link.

The private sector companies have materials that are fairly accessible from a home page via drop-down links labelled 'Sustainability' or 'Corporate Responsibility' or similar. However, of greater importance is the accessibility of materials to staff via company intranets. Although not viewed directly by the author of this report, environmental compliance related guidance materials are reported to be prominent and readily accessible.

5.3.2 Context for DSM and the ISA

Currently there is some environmental information available on the ISA website (e.g. via 'BBNJ'; 'Activities'/'Bibliographic Database' and 'Biodiversity'; and 'Documents'/'Publications') and includes some guidance-type material. However, environment or compliance are not given any real prominence on the home page.

As a new industry with a likely large variation in environmental management capacity among Contractors and Sponsoring States, ready access to quality and focused guidance will be critical factors in environmental compliance assurance.

5.3.3 Recommendations

5.3.3.1 ISA Guidance

The ISA should produce the 'guidelines' covering a range of matters, including environmental performance and compliance, as anticipated in the Draft Regulations on Exploitation.

5.3.3.2 The ISA Website

The ISA should give prominence and ready access to all aspects of environment from its website homepage, including guidance on good environmental practices and science-based reference materials on the likely environmental effects of DSM activities to form an evidence base (as such materials are developed). This should also include a strong focus on 'compliance assistance' (which could be informed by the approach of the Hong Kong EPD).

5.3.3.3 Compliance Promotion Material Language

A bibliography or catalogues of compliance promotional material prepared by the ISA itself should be provided in all the official languages of the Authority. Individual documents should be translated into one of the official languages of the ISA on request.

5.4 PROVISION OF GUIDANCE AND INDICATING GOOD/BEST PRACTICE

5.4.1 Learnings from the Case Studies

All of the organisations reviewed in the Case Studies Report set standards for the environmental performance of a 'regulated party', together with providing guidelines recommending measures (e.g. 'good' practices that could be adopted) that could be taken to achieve the standards. Some organisations also set out what is viewed as 'best practice', usually in the context of technologies, methods or processes where there is an industry-wide agreement that standardises the most efficient and effective way to achieve a desired outcome. Best practice in this respect can therefore be viewed as a practice arrived at on the back of applying an approach in real life conditions and systematically researching and testing its effectiveness and progressively refining it.

Generally, the guidance provided by all parties reviewed in the Case Studies Report was relevant to the compliance activities involved, and aimed at managers and those responsible for the primary delivery of environmental performance as well as at environmental professionals. However, the objectives of the guidance provided varied among regulators with some (e.g. the MMO) focusing more on guidance on licensing procedures than on how to achieve compliance with environmental performance requirements and meeting environmental standards. In some instances, guidance may be produced by other government agencies or by organisations representing the industries being regulated but clear links to such guidance were not necessarily provided.

Some guidance pointed towards or advocated good practice and occasionally best practice (or 'best practicable means', see below).

The private sector companies, especially when guidance produced by their industry organisations is included, produce and contribute to a range of relevant material that is focused on topical issues such as ecosystem services, climate change and water use. Private sector companies also set their own standards (usually mandatory) in certain matters, in which case the guidance provided set out recommended ways of achieving such standards. In terms of addressing good/best practice, the

private sector companies seek to hard wire this into their operational controls and management procedures and/or cover it in their standards and guidance.

The Hong Kong EPD was notable for producing guidance materials that are specifically aimed at compliance. Guidance is provided for achieving compliance with requirements for all six of its programme areas and covering a wide range of topics within each. Sector-specific (e.g. construction) guidance on achieving compliance is also provided. A series of 'best practicable means' guidance notes is also made available⁵⁰.

The majority of EBRD's guidance documents are linked to specific performance requirements⁵¹. The performance requirements are mandatory (and can be regarded as 'standards'); the guidance is focused on helping borrowers comply with the requirements.

5.4.2 Context for DSM and the ISA

The ISA is due to produce 'Standards' and 'Guidelines' for DSM activities in the Area; standards being legally binding, and guidelines being recommended approaches to adopt to meet the standards.

There will be a number of activities involved in DSM that are common with or similar to other marine industries, especially in operating the surface DSM installation and its supply and support vessels. As was recognised at the Pretoria Workshop, it is likely that standards set for such activities by the ISA will be similar to these other industries and as a result there is likely to be much in the way of relevant or readily adaptable guidance on meeting the standards and delivering good and best practice.

Regarding activities that are specific to DSM, a large part of good and eventually best practice will emerge as equipment is designed and tested, mine plans are developed, EIAs and EMMPs are completed and once mining (be it test, pilot, or full-scale) commences. Preparing guidance on good practice (and eventually describing best practice or best available technique) will therefore be a progressive and iterative activity that will benefit from Contractors collaborating on studying, assessing and reporting the environmental performance aspects of their activities.

5.4.3 Recommendations

5.4.3.1 Best Available Technique Guidance

Building on the environmental performance standards that are currently being drafted, the ISA should progressively develop guidance on best available techniques (BAT) regarding design of mining equipment in the context of environmental parameters (such as efficiency of collection, sediment disturbance, and energy demand) as different seabed mining technologies emerge. Guidance on best available techniques should be considered for other aspects of DSM as required. An example of BAT guidance is the Best Available Techniques Reference (BREF) Documents produced by the European Union (EU) for various industrial sectors⁵². Where Contractors deviate for any reason from best available techniques they should be required to set out (e.g. in the 'alternatives' chapter of an EIS) why they have done so in the context of technical, economic, and environmental performance considerations.

5.4.3.2 Guidance on ISA Environmental Compliance Assurance Procedures

The ISA should develop guidance for the Contractors and Sponsoring States on all aspects of its environmental compliance assurance procedures from the EIA and approval process onwards

through to monitoring, auditing, and inspection of operational activities (once these are in turn developed). One purpose of such guidance would be to raise awareness among Contractors (and Sponsoring States) and allow them to align their own environmental compliance assurance practices with those of the ISA, and where necessary identify areas in which capacity building would be of assistance.

5.4.3.3 Guidance on Meeting Environmental Performance Standards and Expectations

As the ISA develops its standards for environmental performance it should also develop guidance for the Contractors and Sponsoring States on the methods available for achieving the standards. Where possible and to save effort, the guidance should draw on that already in existence for other marine sectors undertaking similar operations.

5.4.3.4 Specific Technical Guidance

The ISA should develop specific technical guidance in areas where there may be clear benefits to Contractors. Examples of technical guidance could include:

- *modelling approaches for the sediment plume and sediment deposition;*
- *verification measurement approaches for the sediment plume and sediment deposition;*
- *minimising the footprint at the mine planning stage; and*
- *use of Autonomous Underwater Vehicles (AUV) for seabed monitoring.*

5.4.3.5 Internal Guidance for Authority Compliance Personnel

The ISA should develop ‘standard operating procedures’ for its own environmental compliance assurance personnel covering such matters as auditing and inspection, and escalating enforcement measures.

5.5 PROVISION OF EVIDENCE-BASED MATERIAL AND KNOWLEDGE IN GENERAL

5.5.1 Learnings from the Case Studies

Most of the organisations reviewed in the Case Studies Report maintain some level of evidence-based material on the impacts and effects of various activities, together with relevant information about such matters as the baseline environment, historical trends and key sensitivities. Having access to relevant information and evidence-based material (as distinct from guidance) is especially important for organisations proposing new developments and undertaking EIAs and related studies. For the regulator, having an evidence base is critical in developing policy, regulations and standards.

The MMO has a clear strategy for developing an up to date evidence base to support its planning and management of development in the marine environment⁵³. A structured approach is followed to identify topics where evidence is needed and for then undertaking the necessary research. An MMO team is dedicated to this work. All the evidence reports are published and available online in terms of both on-going and completed work.

As well as providing the basis for MMO’s decisions and underpinning marine plans, many of the evidence reports provide a useful evidence base for undertaking EIAs of new proposed developments.

As well as its ‘evidence base’, the MMO maintains a ‘Master Data Register’ tool⁵⁴ for data management which contains information, a large part from third-party sources, to support its

regulatory and decision-making functions and which is also a good reference point for marine licence applicants in planning their projects and undertaking EIAs, particularly for baseline information. Other evidence-based material is also available. For example, recognising the specific issues facing the UK marine aggregates industry, a fund was established through a levy on marine aggregates (the Marine Aggregate Levy Sustainability Fund). According to the British Marine Aggregate Producers Association (BMAPA)⁵⁵, “between 2002 and the close of the fund in March 2011, over £22.5 million was spent on research associated with marine aggregate extraction, to improve the ways in which the industry was planned, assessed and managed”. The research also provided a large evidence base for the impacts of aggregate extraction and means for mitigating and managing impacts. The work under the fund was administered via a steering group of government policy makers, regulators and scientific advisers, and industry.

Another example is provided by the oil and gas industry. In 2006 a group of IOGCs combined resources to found a research programme aimed at improving understanding of the potential physical and behavioural effects of sound on marine animals due to various types of exploration and production activity. The Joint Industry Programme (JIP) that followed was the most extensive industry research programme in this field. The JIP worked with multi-national groups, experts and NGOs, and committed in excess of US\$ 30 million to the research.

IIPECA on behalf of its member oil and gas companies runs a Marine Geospatial Bibliography that is discussed further below⁵⁶.

5.5.2 Context for DSM and the ISA

DSM is a new industry. As such there is currently no precedent for large scale activity in the deep-sea environment of the nature envisaged. In turn this means there is currently little or no evidence base for impacts and large-scale/long-term effects. If EIAs for seabed mining in the Area are prepared in the current context they will be challenged by a general lack of knowledge (compared with other industries) and would rely heavily on the precautionary approach. As a result, the EMMPs would have a strong element of ‘adaptive management’ contained in them. Even with a reasonable evidence base for impacts and effects, EIAs are still likely to require the precautionary approach to be applied in a number of areas and the EMMPs to contain adaptive management approaches for some aspects. The needs for precautionary approaches and adaptive management are acknowledged in the ISA’s ‘Strategic Plan of the International Seabed Authority for the Period 2019–2023’.

The ISA’s newly developed data repository, DeepData, was launched in July 2019 at the Authority’s 25th Session. According to the ISA⁵⁷ *“DeepData holds centralized data of public and private information on marine mineral resources acquired from various institutions worldwide. The Authority uses this data to standardize and evaluate data for quantitative mineral assessments. The integrated database system will be developed for use as a management and research tool that will be made accessible to authorized representatives of member States, scientists and researchers to further assist the Authority in its mandated work.”*

The ISA’s other databases include:

- a Library Catalogue of more than 2,000 books, monographs, reports and specialist periodical titles and annuals⁵⁸; and

- a Bibliographic Database of references to scientific papers⁵⁹.

As DSM activity picks up pace it will generate information on impacts and effects that will begin to further build the evidence base for both adaptive management decisions and future EIAs.

Regulation 2 (g) of the Draft Regulations on Exploitation requires the incorporation of “*the Best Available Scientific Evidence into decision -making processes*”. Regulation 3 of the Draft Regulations on Exploitation and Strategic Direction 4 of the Strategic Plan of the ISA (2019 to 2023) both address the promotion and encouragement of marine scientific research in the Area, collaboration between parties in undertaking investigations and the sharing of results and data.

5.5.3 Recommendations

5.5.3.1 EIA Process and Evidence Base

The ISA should adopt an ‘evidence plan’ process (or similar) within the EIA process (and also to advise the REMPs). The evidence plan process would include such matters as the following:

- *the approach to developing and agreeing on the evidence base for the REMP and EIA (including the EIA approval process) so that decision-making processes are suitably informed and the EMMP has as solid a foundation as is practicable;*
- *deploying external expert scrutiny to progressively identify gaps in the evidence base, allowing the ISA to engage industry on specific issues of uncertainty and gaps in knowledge/evidence base;*
- *involving external experts to build capacity within the ISA through Authority staff engaged with external experts in key topic working groups;*
- *continuously incorporating evidence base material into a data management system (which could be part of DeepData) as knowledge of the impacts and effects of DSM grows and evolves; and*
- *providing public access to the evidence base that supports decision-making.*

5.5.3.2 Contribution of Contractors to the Evidence Base

The ISA should require all Contractors to contribute to the evidence base so that all Contractors can benefit. As addressed in recommendations elsewhere, the ISA should require Contractors to provide evidence base material to the ISA including such matters as model validation, monitoring impacts and effects (and evaluating the results) and testing the effectiveness of mitigation measures.

5.5.3.3 Joint Industry Projects

In accordance with the provisions of draft Regulation 3 and Strategic Direction 4, the ISA should require Contractors and encourage Sponsoring States (and also other interested parties e.g. non-sponsoring States, research institutes, as appropriate) to fund collaborative studies that are aimed at important areas of uncertainty over environmental impacts and effects that are common to all Contractors within a region (e.g. Clarion-Clipperton Fracture Zone, CCFZ or Mid Atlantic Ridge, MAR) and/or a type of mining (e.g. nodules or sulphides). The ISA should direct the scope and control the operation of such studies, to avoid conflict of interest.

5.5.3.4 Evidence Team

Building on some of the current functions of OEMMR, the ISA should include an ‘evidence team’ (or similar) within its environment department with a remit that includes the following:

- **engaging with stakeholders over what research-based information is needed to address uncertainty and inform a robust evidence-based approach to decision-making;**

- **engaging with Contractors and Sponsoring States on joint industry projects; and**
- **administering the DSM evidence database and maintaining it up to date.**

5.5.3.5 Compliance Monitoring Feedback

The ISA should provide a mechanism for compliance monitoring reporting to feed into the evidence base so that all Contractors can learn from measures that are taken to address an incident of non-compliance or to generally improve already compliant performance.

5.6 USE OF WEB-BASED AND INTERACTIVE TOOLS

5.6.1 Learnings from the Case Studies

The South Africa DEA website provides links to and hosts interactive GIS-based sites and a screening tool as follows.

- The Environmental Geographical Information Systems (E-GIS) provides access to baseline environmental geospatial data, map services, printable maps and relevant documents for use by government agencies, business and the public.
- An interactive map is also hosted that shows Protected and Conservation Areas of South Africa, extracted from the Protected and Conservation Areas (PACA) Database⁶⁰.
- The DEA website also hosts an Environmental Screening Tool. The tool is a GIS-based application which allows an organisation applying for environmental authorisation to screen the proposed development site for environmental sensitivities and related matters⁶¹.

The MMO maintains an interactive, GIS-based Marine Information System and a marine planning evidence base that is accessible via an interactive map.

IPIECA's Marine Geospatial Bibliography is a GIS-based knowledge-sharing platform collecting and making available information on oil, gas and the environment for industry, science and the public. Much of the information is focused on peer-reviewed evidence-based material on the impacts and effects of the industry's activities. The user can search for information through the map or search fields and can also help add to the bibliography by submitting a resource.

All the above are particularly relevant in terms of helping (through access to information) to maximise the value of the EIA stage of development projects, which in turn provides a better foundation for EMMPs and future environmental compliance actions.

Private sector companies maintain compliance-associated materials on their intranets (not reviewed in this study). In some circumstances compliance actions are tracked and reported via interactive on-line systems.

5.6.2 Context for DSM and the ISA

The ISA will be responsible for environmental compliance assurance for activities in remote locations covering vast areas of seabed; geospatial information will play a key role for both the ISA and for the Contractors.

Reflecting the early stage of the DSM industry and availability of data, the ISA website is also at an early stage in the provision of information systems. Such systems effectively comprise Deep Data (which is accessible by the general public but geared towards expert users) and copies of maps (in

pdf format) showing areas that are under contract, reserved for developing country applications, or designated Areas of Particular Environmental Interest.

5.6.3 Recommendations

5.6.3.1 Interactive Mapping

The ISA should develop its Deep Data concept to become a fully interactive geospatial data repository with open access to researchers and the public.

5.7 OUTREACH ACTIVITIES

5.7.1 Learnings from the Case Studies

All the organisations reviewed in the Case Studies Report adopted various forms of outreach activity as part of compliance promotion. For the regulatory bodies, these activities included hosting and speaking at conferences, seminars, workshops and engagement with the regulated community (one-to-one and with small groups). For the private sector the focus was more on engaging staff involved in delivering environmental performance through training and e-learning, with similar processes applied for Contractors.

The structured approach to outreach activities adopted by EBRD is worth noting.

Over the years, the EBRD has run a programme of capacity building workshops on its Environmental, Health and Safety and Social Policies⁶². These workshops covered a range of matters linked directly to compliance including:

- the bank's environmental policies, procedures and due diligence requirements, including monitoring;
- the legal mechanisms and covenants which the bank agrees with clients to manage risk and drive compliance;
- industry sector-specific environmental issues typically faced by clients; and
- the environmental consulting skills and the contracting requirements of the bank.

The workshops were held in multiple countries of EBRD operations and attended by project managers, owners, and managers in host country consulting companies, together with local technical specialists. They were organised and facilitated by external consultants and non-host country participants included international environmental experts and senior EBRD specialists to present case studies and transfer knowledge.

5.7.2 Context for DSM and the ISA

The ISA promotes workshops on a variety of topics as a means of outreach. Workshop attendance is typically made up of representatives from academic institutions, marine industries, ISA Contractors, ISA Secretariat and LTC, NGOs, national agencies, and international and regional organisations. Many of the workshops include a strong element of capacity building and training and they are held across a variety of geographic locations to facilitate access and participation⁶³.

Even if in the future there is a large array of guidance material produced by the ISA and made available to Contractors and Sponsoring States there will still be a high risk of inconsistency in

approaches to compliance among the Contractors and Sponsoring States. This inconsistency could derive from traditional approaches in different countries and/or variation in capacity.

5.7.3 Recommendations

5.7.3.1 Sponsoring State and Other State Workshops

The ISA should continue to conduct awareness raising and capacity building workshops in the Sponsoring States initially focused on those moving towards the exploitation phase and those with a poor compliance record during exploration. As well as Sponsoring States, the workshops should also be conducted for developing countries that are expected to be decision-makers on DSM environmental aspects, and which have identified the need for such capacity building. The workshops could follow a similar approach to that adopted by the EBRD in terms of the national representatives invited to participate and the involvement of international experts alongside ISA environmental compliance assurance staff.

5.7.3.2 Formal Outreach Activities Focused on Environmental Compliance Assurance

The ISA should develop a compliance engagement strategy and plan that makes provision for engagement with the Contractors and Sponsoring States. The strategy and plan should aim to ensure that organisations are being targeted by the ISA with an appropriate level of engagement around aspects of their Contracts that could be challenging to them in terms of compliance, which in turn need to be addressed with capacity building activities (this ‘risk-based’ approach is discussed further in Section 5.6).

5.7.3.3 Other Outreach Activities

The ISA should develop a formal programme for its environmental compliance assurance personnel to engage with Contractors and Sponsoring States, as well as other States’ stakeholders, at conferences, seminars and workshops, whether these are hosted by the ISA or other parties.

5.8 USE OF INCENTIVES

5.8.1 Learnings from the Case Studies

Where compliance promotion is concerned, incentives can apply to staff, Contractors and the regulated parties depending on which type of organisation is involved. Several organisations incentivised staff through awards schemes and several regulators did likewise for the regulated community. Where sub-contractors are concerned, the private sector focused on approved supplier schemes as opposed to awards, with the incentive in this case being the opportunity to be short-listed or in a preferred bidder status for tendering opportunities. In some instances, regulators also participated in setting up ‘supplier registration’ systems.

Several approaches are worth noting.

- The MMO operates a rigorous process and strict requirements for the validation of laboratories before they can provide analytical services in support of marine licence applications and monitoring⁶⁴.
- EBRD has a structured approach to its annual awards scheme for projects and clients⁶⁵.
- The South Africa DEA runs an EIA practitioner registration scheme. Only registered practitioners can undertake and submit EIAs⁶⁶.

- Private sector companies have scorecard approaches for remunerating senior managers that include environmental performance among the factors that are measured, and influence pay and bonuses. It should be noted that while the concept is a good one there are practical difficulties in application such that the measured indicators are usually limited to ones that can be readily quantified (e.g. lost time safety incidents and greenhouse gas emissions).

5.8.2 Context for DSM and the ISA

From the Contractor and Sponsoring State perspectives, an Environmental Performance Guarantee as is proposed under draft Regulation 26 can be regarded as an incentive for both environmental performance and compliance.

The global expertise available for providing environmental survey, analytical (from modelling to species identification) and impact assessment services to the DSM industry is very limited compared with that available for other industries such as deep-water oil and gas.

As noted elsewhere, DSM is a new industry and as it proceeds it is reasonable to anticipate a high degree of innovation, especially in design but also in approaches to EIA and monitoring.

5.8.3 Recommendations

5.8.3.1 Supplier Registration Schemes

Based on an agreed set of criteria for international class provision of environmental services in areas such as marine survey, laboratory chemical analysis, laboratory biological analysis, sediment modelling and EIA services, the ISA should set up a supplier registration scheme. In order to maximise the inclusiveness of the scheme, prospective suppliers could be placed in at least two categories, e.g. Category A ‘Full Service’ Provider and Category B ‘Developing’ Provider. Category A providers should be encouraged to participate in ISA-managed initiatives aimed at enhancing the capacity of Category B providers.

5.8.3.2 Design Awards Scheme

The ISA should develop an awards scheme for design innovations that have an environmental benefit or materially reduced impact. Award topics could include for example: most energy efficient design; most efficient collector; and best design for sediment control.

6 COMPLIANCE MONITORING

6.1 INTRODUCTION

The table below lists aspects and characteristics of an organisation's approach to compliance monitoring and signposts the case studies that address these, indicating those that embody good practice. The section number references in the table are those for the Case Studies Report.

'Compliance monitoring' includes: self-monitoring and reporting; review by the ISA of monitoring reports; surveillance, inspection and auditing; and third party or independent verification.

| | South Africa DEA | Hong Kong EPD | New Zealand EPA | MMO | PNA | Mining | Oil and Gas | EBRD |
|---|---------------------|------------------|--------------------|-------|-------|--------|-------------|-------|
| Overall management framework for monitoring | | 3.4.1 | | 5.4.1 | | 7.4.1 | 8.4.1 | 9.4.1 |
| The role of self-monitoring and reporting | 3.4.2 | | | | | 7.4.2 | 8.4.2 | |
| The role of regulator/company/bank inspection and audit | | | | | 6.4.3 | 7.4.3 | 8.4.3 | |
| The role of independent/third-party verification | | | | | | 7.4.4 | 8.4.4 | 9.4.4 |
| Targeting and prioritisation (risk-based approach) | | | 4.4.5 | 5.4.5 | | | | |

In addition to the points above, the Round Table Discussion also noted the importance of data and data management (which is discussed in Section 5.7).

6.2 OVERALL MANAGEMENT FRAMEWORK FOR MONITORING

6.2.1 Learnings from the Case Studies

Where regulators are concerned, the overall requirements for compliance monitoring are essentially determined by a combination of:

- the consenting/licensing/permitting/contracting system and conditions under which an activity is allowed to take place, or a project allowed to operate (e.g. as established by an EIA and EMMP process), and
- overarching national rules, regulations and standards.

It is worth noting that the MMO has a compliance and enforcement strategy⁶⁷ which among other things includes building a database of evidence of compliance and non-compliance aimed at informing the effectiveness, consistency and proportionality of the MMO's regulatory activities in

the future. The MMO is also in the process of developing a 'trusted customer' model⁶⁸ aimed at benefitting those regulated parties who have a proven track record of consistent compliance.

Environmental monitoring can embrace a range of activities which can be simplified to:

- demonstrating routine compliance with a quantified limit or standard e.g. by end-of-pipe or nearfield monitoring, ongoing or continuous measurement of physical and chemical parameters; through to
- surveys and studies of longer-term biological effects at a marine/terrestrial ecosystem or airshed or river basin (i.e. regional) scale to understand how an activity is performing in terms of more strategic desired environmental outcomes.

For example the Hong Kong EPD, in addition to its routine environmental compliance assurance activities, also conducts its own ambient monitoring programmes, especially for air quality⁶⁹, to give it a broader view of the environmental health of the region beyond that obtained from monitoring data provided by the regulated community and inspections of individual operating facilities.

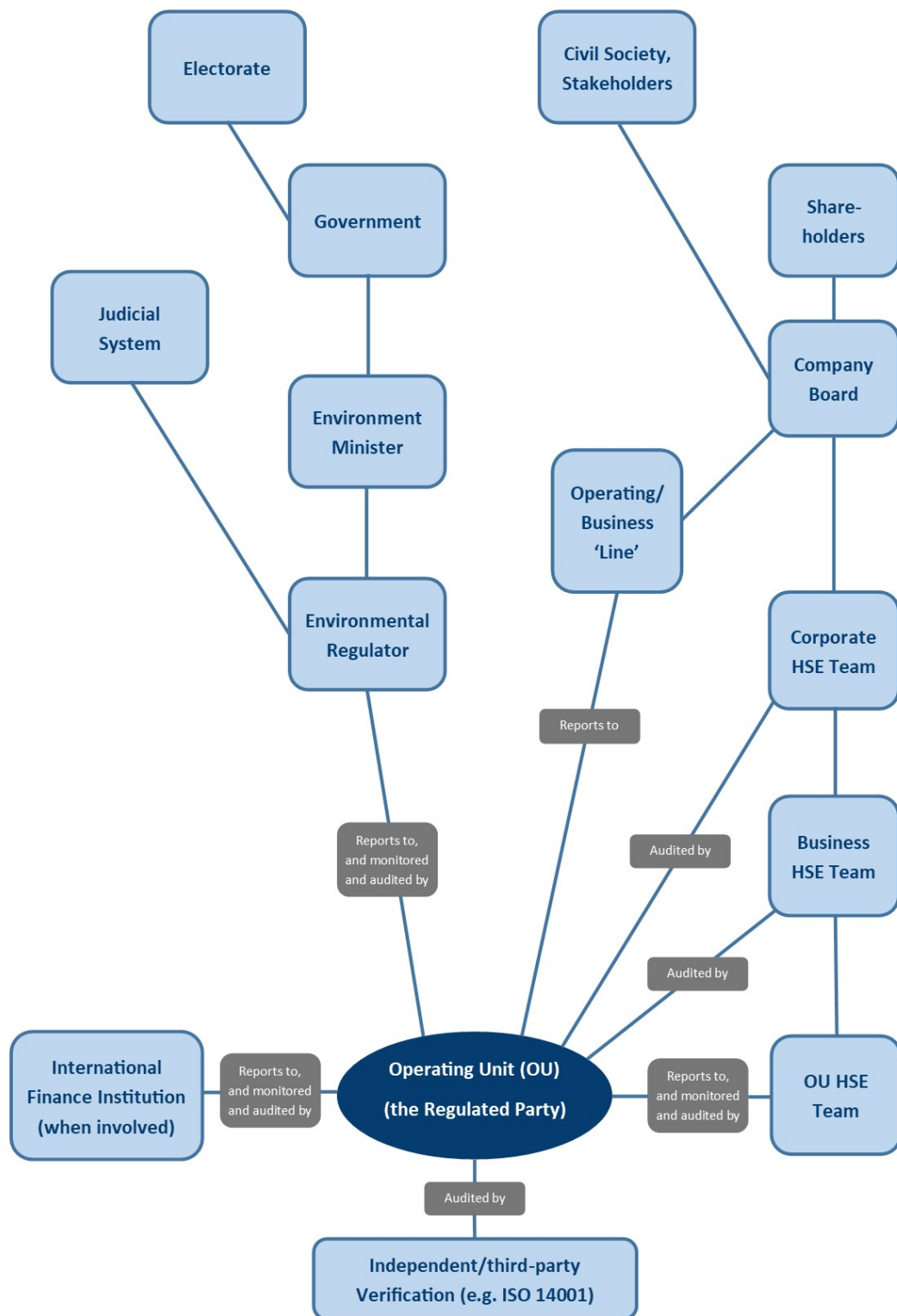
The EBRD sets out its overall framework for compliance monitoring in its *Procedures for Environmental and Social Appraisal and Monitoring of Investment Projects*⁷⁰. These set out the roles and responsibilities of both the client and bank functions in the monitoring process.

As regulated parties, the private sector companies undertake their compliance monitoring activities within the context of environmental management systems and a proactive approach to environmental compliance assurance. Usually these systems are either accredited to ISO 14001 or aligned with the requirements of the standard. Contractors are normally required to adhere to these or similar systems or are assisted in doing so. One company describes the monitoring process as 'three lines of defence':

- self-monitoring and reporting by a contractor or operating business;
- audit and inspection by the HSE function (at operating business and central business level); and
- independent/third party verification.

There are generally at least two parties with an interest in environmental compliance assurance: the national regulator and the corporate entity for the operating business. Where funding is sought by a project from an international finance institution this will introduce an additional party: the bank providing funding. An illustration of this is provided in Figure 5.

Figure 5 **Typical Environmental Compliance Framework**



6.2.2 Context for DSM and the ISA

Other than where the Enterprise is involved, each ISA Contract will have associated with it:

1. a private sector entity as Contractor with a Sponsoring State or Sponsoring States; or
2. a State enterprise with a Sponsoring State or States; or
3. a government agency of a State Party.

The regulated party (i.e. the Contractor) could therefore be a private sector entity, a State enterprise, a government agency of a State Party, the Enterprise of the ISA or a joint venture formed between the Enterprise and any of the three categories of Contractor listed above. Therefore, there are seven different categories of potential Contractors, with possible additional categories of joint ventures (JVs) between States and JVs between States / State enterprises and private investors. Interoceanmetal Joint Organization, made up of Bulgaria, Cuba, the Czech Republic, Poland, the Russian Federation and Slovakia is an example of a JV between States⁷¹.

Regardless of how it is constituted, the Contractor as the regulated party will have primary responsibility for complying with the environmental requirements set out in the ISA's Regulations and Standards, and in its Contract with the ISA. The ISA will have primary responsibility for environmental compliance assurance regarding the Contractor's environmental performance. Pursuant to UNCLOS (and as reflected by Regulation 105 of the Draft Regulations on Exploitation) the Sponsoring State (or States) will also have environmental compliance assurance responsibilities regarding a Contractor's environmental performance, which can be seen in part as an additional layer of environmental compliance assurance to that provided by the ISA but also protecting the Sponsoring State from liability in the context of Article 139 of UNCLOS. States Parties (sponsoring States) can also require or impose higher environmental standards.

For DSM it is therefore assumed that the ISA and the Sponsoring State will both separately undertake compliance monitoring. One important consideration is the extent to which separate monitoring programmes might interplay with each other. For example, capacity at the State level will likely play a role whereby some States will be active, while others may be passive and see the ISA as the primary regulator. In some circumstances the Contractor actually undertaking the work may be a mature organisation and also apply its own compliance monitoring practices.

A suitable compliance monitoring approach for the ISA is likely to be similar to that used by national regulators rather than the other organisations covered in the case studies. However, it is reasonable to assume that the Contractors would adopt compliance monitoring practices similar to those used by private sector companies.

Monitoring and reporting of DSM activities in the Area can be broadly divided into four types:

1. remote sensing/reporting of DSM installation location and activity to ensure that Contractors are mining (or undertaking other activities) where the terms of the Contract allow;
2. on-going routine monitoring and reporting of operational factors such as emissions, discharges, extraction rates, sediment mobilisation, water quality etc against ISA Standards and Contract conditions that set specific environmental thresholds;
3. incident reporting;

4. monitoring, evaluation and periodic reporting of long-term effects (see below) on the marine ecosystem, including surveys of 'impact reference zones'⁷², 'preservation reference zones'⁷³ and Areas of Particular Environmental Interest (APEI).

The nature of monitoring and reporting is likely to vary through project phases. For example, monitoring suspended sediment during a commissioning phase may be aimed at validating a model, while monitoring the same factor during a later steady state operating phase may be aimed at demonstrating compliance with an ISA Standard. However, 1 to 3 above are relatively straightforward types of monitoring (in that they should be readily measurable) and reporting from an environmental compliance assurance perspective. Some of this monitoring activity will be continuous or near continuous with real time reporting.

Monitoring, evaluation and reporting of long-term effects on the marine ecosystem is more likely to be based on periodic surveys assessing environmental change at Impact Reference Zones (IRZ), Preservation Reference Zones (PRZ) and APEIs as part of adaptive management approaches and also set within the framework of a REMP. Evaluation and reporting are likely to be aimed at confirming EIA predictions and understanding the long-term sustainability of DSM in any one region. Reporting is more likely to be annual with less frequent (e.g. every five years) substantive reporting of trends.

Long-term Effects

'Long-term effects' refers primarily to the effects on the marine environment (especially seabed ecosystems) that will endure beyond the end of mining in a particular Contract area. At the end of mining, and depending on which type of mining, potentially large areas within the Contract Area will have been exposed to complete habitat loss and potentially large areas beyond the immediate mine sites will have been exposed to secondary impacts such as elevated concentrations of suspended solids and elevated rates of sediment deposition. These impacts could result in wider ecological effects including loss of genetic diversity and loss of connectivity between ecological populations. Such effects could be experienced within a particular Contract area and beyond it and could include the cumulative effects of mining in multiple Contract areas.

6.2.3 Recommendations

6.2.3.1 Fair and Consistent Compliance Approach

The ISA's overall approach to environmental compliance assurance should be designed to be fair and consistent regardless of how the Contractor is constituted (i.e. whether it is a State or State enterprise, the Enterprise or a private company with a Sponsoring State or a joint venture arrangement).

6.2.3.2 Development of Compliance Monitoring Practices

The ISA should establish its compliance monitoring practices in provisional form and then test and refine them in detail during a pioneer phase of, for example, a test-mine, or a pioneer Contractor, preferably in a joint venture with the Enterprise, exploiting in a particular region.

6.2.3.3 Compliance Monitoring Guidance for Contractors and Sponsoring States

The ISA should develop guidance on the compliance monitoring approach it expects to be adopted by its own organs, Contractors and Sponsoring States, which complement those to be adopted by the ISA. The approach should set out the roles of self-monitoring and reporting at the offshore installation level, regulator and corporate entity audits and inspections, and third-party verification. This guidance should be based on the practices used by international oil and gas and

mining companies for Contractors, and those used by regulators for the ISA and the Sponsoring States.

6.3 THE ROLE OF SELF-MONITORING AND REPORTING

6.3.1 Learnings from the Case Studies

Regulators require the regulated parties to provide information and reports based on monitoring against the conditions of licences, permits etc, or in the case of the EBRD against pre-agreed plans (that have been publicly disclosed). In other words, self-monitoring by regulated parties is a controlled activity and not a voluntary one and not to be confused with self-regulation. Reporting the results of monitoring and other information (including vessel location for some sectors) takes several forms from near real-time data input to regulator systems through to project milestone, and quarterly, annual and periodic (e.g. 5-year reviews) reporting.

The Hong Kong EPD approach is worth noting in that it requires a degree of independence of the teams and individuals involved in the monitoring and reporting. The permit holder must establish an environmental team (ET) which cannot be in any way an associated body of the Contractor or the independent environmental checker (IEC). The environmental team is responsible for the implementation of the Environmental Monitoring and Audit (EM&A) programme. An IEC must also be appointed by the permit holder and must also not be an associated body of the contractor or the ET for the project. Among other matters, the IEC is responsible for auditing the overall EM&A performance. There are also strict requirements in terms of years of experience for both the ET leader and the IEC. By the nature of these roles, although not fully independent, the responsibility for monitoring, auditing and reporting is one place removed from a permit holder and contractor. In addition, the Environmental Monitoring and Audit Manuals and Reports for projects are publicly available for review.

The private sector companies' approach to self-monitoring is set in the context of an environmental management system as noted above. Environmental performance data are collected and reported (by operating businesses and contractors) to demonstrate compliance with national laws and specific licence or permit conditions, and also with a company's own standards and requirements. In some instances, monitoring is integrated with the tracking of compliance actions and interfaced with software systems operated by regulators. For example, in the UK, the Environmental and Emissions Monitoring System (EEMS) is the environmental database for the country's oil and gas industry⁷⁴. Its primary purpose is to record measured and calculated data relating to emissions and discharges from offshore installations. Operators enter their data directly via a portal and among other things this provides the regulator with control over the nature, volume and format of the data.

Vessel identification and location reporting is a form of self-monitoring in use for fisheries, allowing surveillance by regulatory bodies involved in fisheries management. For example, vessels operating in the area covered by the Parties to the Nauru Agreement are required to have a functioning Automatic Location Communicator (or Mobile Transmitting Unit) on the vessel at all times⁷⁵. Similarly, a vessel monitoring system (VMS), a satellite-based fishing vessel monitoring system providing data to the fisheries authorities at regular intervals on the location, course and speed of vessels, is compulsory for EU vessels (and non-EU vessels in EU waters) above 12 m overall length⁷⁶. Similar approaches are used in the UK marine aggregates sector where all vessels are required to

have an operating and accredited Electronic Monitoring System⁷⁷. Data reported from the system allows the regulator to check that dredging has taken place where it was licensed to, as well as the time spent dredging (correlating to intensity when aggregated up for a period of time such as one year) at any particular location.

6.3.2 Context for DSM and the ISA

For DSM activities in the Area, the majority of environmental monitoring data will be produced by the Contractor in accordance with an Environmental Management and Monitoring Plan approved by the ISA before mining commences. This will include on-going monitoring of environmental performance of operational activities, incident reporting and reporting on the longer-term effects of DSM. While reporting on the environmental performance of operational activities is likely to be based on a relatively standard set of parameters for each type of DSM activity, reporting on the longer-term effects is more likely to be site-specific and in accordance with the findings of an EIA (and thence contained in an EMMP). On the basis that adequate mechanisms (systems, resources and capacity) are in place, confirmation that reporting requirements are being met, verification of the data they contain, and reviewing data on routine environmental performance should be relatively straightforward and on-going activities, that largely involve comparison of the reports and data submitted against EMMP requirements, Contract conditions, and the environmental performance standards set by the ISA. In contrast, data review of the reports evaluating longer-term effects will be a periodic activity requiring expert knowledge input.

Reporting will generate large amounts of data which will require management by the ISA and access by other parties. Consistency in the collection (e.g. sampling methodologies, area and frequency of sampling), recording and reporting of that data will be essential.

DSM will be taking place in remote locations indicating that remote means of DSM installation surveillance will be required.

Currently, Contractors are required to report annually, and despite more recent introduction of a guidance document on annual reporting, the consistency and quality of that reporting appears to have been patchy. These reports are not made publicly available, nor shared with the Council or Assembly⁷⁸.

There are additional reporting requirements proposed in the current Draft Regulations on Exploitation. Draft Regulation 51 envisages only annual reporting of monitoring data by a Contractor to the Secretary-General in accordance with the terms and conditions of its Environmental Management and Monitoring Plan and the Draft Regulations on Exploitation. Draft Regulation 38 covers annual reporting:

1. A Contractor shall, within 90 Days of the end of each Calendar Year, submit an annual report to the Secretary-General, in such format as may be prescribed from time to time by the relevant Guidelines, covering its activities in the Contract Area and reporting on compliance with the terms of the exploitation contract.

2. Such annual reports shall include: [.....]

(g) The actual results obtained from environmental monitoring programmes, including observations, measurements, evaluations and the analysis of environmental parameters,

reported against, where applicable, any criteria, technical Standards and indicators pursuant to the Environmental Management and Monitoring Plan, together with details of any response actions implemented under the plan and the actual costs of compliance with the plan;

(h) A statement that all risk management systems and procedures have been followed and remain in place, together with a report on exceptions and the results of any verification and audit undertaken internally or by independent competent persons;

In addition, Draft Regulation 33 addresses ‘incident reporting’. In the event of an ‘incident’ (as defined in Schedule 1 of the Draft Regulations on Exploitation) the Secretary-General is notified and following a series of response actions (as set out under the draft Regulation) a record of the incident is made in the Incidents Register. It is the responsibility of the Secretary-General to report such incidents as well as the measures taken to address them to bodies including the relevant States, the Commission and the Council at their next available meeting⁷⁹.

6.3.3 Recommendations

6.3.3.1 Incident Reporting

While environmental monitoring and reporting will be focused on a range of planned operational parameters the ISA should also require Contractors to provide Incident Reporting for unplanned events and upset conditions including:

- *near misses as well as incidents;*
- *the response actions;*
- *lessons learned; and*
- *relevant data on such matters as the nature of the incident, scale and releases to the environment.*

Incident Reports should be made publicly available to allow other Contractors to learn lessons from them.

6.3.3.2 Trigger for Environmental Incident Reporting

In the Draft Regulations on Exploitation the trigger for notifying the Secretary-General (under Draft Regulation 33) of an environmental incident (as defined in Schedule 1) appears to be: “Serious Harm to the Marine Environment or to other existing legitimate sea uses, whether accidental or not, or a situation in which such Serious Harm to the Marine Environment is a reasonably foreseeable consequence of the situation”. This trigger is presently undefined in real terms and probably sets a very high bar before an environmental incident needs to be notified. The ISA should provide clear definitions that are, for example, broadly analogous to those used in other industry regulatory regimes, such as for oil and gas, for reporting and action thresholds for accidental releases of oil or chemicals for example.

6.3.3.3 Vessel Identification and Location

In addition to the requirements of Regulation 102 of the Draft Regulations on Exploitation (setting out requirements for DSM installations to have electronic monitoring systems), the ISA should require the Contractor and the Sponsoring State (and/or Flag State if relevant) to declare to the ISA (via a notification procedure, set by the ISA) before embarkation of any vessel or installation

engaging in DSM activities including a description of where in the Area it will be operating and its planned activities (e.g. research, exploration, exploitation, support) while there (as contained in the Plan of Work). All DSM installations and support and supply vessels should be required to have an accredited Satellite - Automatic Identification System (AIS) operating at all times to allow unique identification, position, course and speed to be monitored by the ISA and others.

6.3.3.4 Reporting of Routine Environmental Monitoring Data

The ISA should establish a data management system for reporting routine environmental performance data. The system should allow direct input of data for specified parameters in specified formats for all Contractors in real-time (or effectively in real-time). The system should allow on-going review by the ISA of Contractors' performance.

6.3.3.5 Periodic Review and Assessment of Routine Environmental Monitoring Data

As a complementary activity to on-line reporting, the ISA should require Contractors to provide periodic (e.g. monthly or quarterly but more frequently than annually) reports including statistical analysis, assessment of trends and identification of areas for improvement.

6.3.3.6 Internal Action Thresholds

For quantified monitoring parameters the ISA should require Contractors to set internal action thresholds for example:

- at 75% of a limit, Action 'A';
- at 90% of a limit, Action 'B';
- at 100% or more of a limit, report non-compliance.

Non-compliance reporting should include a record of the actions taken to try to avoid a breach and should be publicly available to allow other Contractors to learn lessons from them.

6.3.3.7 Reporting of Longer-term Environmental Effects

The ISA should require Contractors to report on longer-term environmental effects on a periodic basis (e.g. annually or post-survey) and in a substantive review (e.g. every five years). The ISA should develop guidance and specify required formats for the interpretative reporting of longer-term environmental effects, evaluating trends and projections and comparing what is observed with the EIA predictions.

6.3.3.8 Peer Assist/Peer Review Process for Longer-term Effects Reports

The ISA should involve suitably qualified experts from a non-Sponsoring State country or countries in a peer assist/peer review process for the reporting by Contractors of longer-term effects.

6.3.3.9 Monitoring of Regional Effects

As part of the REMPs process, Contractors should contribute to (in cooperation with the ISA and all other Contractors operating in the region) periodic (e.g. every five years) 'state-of-environment-health' assessments on a regional scale. Part of any one Contractor's overall monitoring plan should include monitoring targets and actions that will feed into an understanding of potential regional scale and cumulative effects.

6.3.3.10 Satellite Communications for Contractor Reporting from the Area

On behalf of the Contractors, the ISA should explore with commercial providers the means of providing full and reliable internet connectivity for DSM installations operating in the Area.

Connectivity should be considered in terms of safety, environmental monitoring reporting in real time and crew welfare.

6.4 THE ROLE OF REGULATOR/COMPANY/BANK INSPECTION AND AUDIT

6.4.1 Learnings from the Case Studies

All the organisations reviewed conduct their own inspections and audits of a regulated party. Usually a range of methods is deployed, from reviewing and assessing the data reported under self-monitoring, through to regular inspections, unannounced visits and investigations and permanent on-board presence of observers. These activities are usually planned based on an exercise in targeting and prioritisation, which some regulators refer to as a 'risk-based approach', aimed at achieving proportionality in regulator actions within the context of finite financial and staff resources (see Section 5.6 below).

The PNA approach is worth noting in that inspection is virtually a full-time and real-time activity. Under its Observer Programme, the PNA member states have observers on board all licensed purse seine fishing vessels in PNA waters⁸⁰. The observers are trained independent monitors of what is taking place at sea and on-board the vessel. The main role of the observers is to monitor and gather data, and they do not directly undertake enforcement actions and so their role while on board is a neutral one. Among other matters, information gathered by observers, about catches for example, informs tuna stock assessments by scientists and helps with developing and improving compliance measures. Each member state has its own observer force which it recruits and trains. In the past there have been general issues with staff turnover and retention. More recently some member states, e.g. the Marshall Islands, have involved the regional fisheries organisations (such as Pacific Islands Regional Fisheries) alongside colleges in observer training programmes and sought to make the role a career that is attractive to school leavers and others⁸¹. The PNA Observer Agency assists member state coordinators with their programmes and has coordinators in key ports to support observers and debrief them after each fishing trip. If, following a debrief in port, an incident needs investigation, a report is passed to the member state's enforcement division for appropriate investigation and possible next steps.

The private sector companies also have internal self-inspection approaches that are worth noting.

- Rio Tinto environmental audit teams are made up of a combination of HSE professionals and management staff (i.e. non-HSE professionals) from the operating businesses. The latter are trained to conduct environmental (and safety) compliance audits; they then form part of an audit team for audits of other operating businesses. The composition of the audit team (i.e. the inclusion of staff from other operating units) provides a peer assist – peer review function with two-way exchanges of learnings.
- The IOGCs typically operate three levels of inspection and audit of operating businesses. The first level is undertaken by the HSE function within the operating business. The second level is undertaken by the central HSE function in the global upstream business. The third level is undertaken by a corporate audit team and is viewed as being at least partially independent. General audit teams (i.e. not just focused on environment) often include non-HSE disciplines such as civil engineering, process engineering, drillers and accounting functions.

6.4.2 Context for DSM and the ISA

The remoteness of the DSM operations, and the associated logistical and cost challenges of physically visiting ISA Contract sites, increases the importance of reviewing and assessing the data reported under self-monitoring, together with targeting and prioritisation of inspection and audit visits.

Part XI (Inspection, compliance and enforcement) of the Draft Regulations on Exploitation envisages onboard inspection of equipment (e.g. that used for measuring the quantity of mineral ore produced), documents and records (including financial ones), and also possible inspection at Contractor onshore offices. The inspection regime envisaged is not limited to the environment and so the work of the inspectors will be wide-ranging and will only include environmental performance among many other targets for inspection activities.

Current thinking on a possible inspection mechanism has been set out in a discussion note prepared by the Secretariat for the Council (Implementing an inspection mechanism for activities in the Area, March 2019⁸²). The note acknowledges the need for a robust and transparent approach that is economic and efficient, includes targeting and prioritisation through a risk-based approach and considers the challenges of the remoteness of the DSM activities. The note also considers the approach adopted under the Convention on the Conservation of Antarctic Marine Living Resources. The approach under this convention involves the following:

- inspectors are designated by members of the Commission for the Conservation of Antarctic Marine Living Resources and operate under its terms and conditions, but they are subject to the jurisdiction of the national authority contracting party to the Convention of which they are nationals;
- the Commission maintains a certified list of qualified inspectors put forward by the nations that are members of the Commission; and
- inspectors report to their national authority who in turn report to the Commission.

The table below sets out the sort of parameters that might be expected to be subject to review, audit and inspection by the ISA and shows that 'inspection' as such makes up a small part of the overall set of likely compliance assurance actions.

| Environmental data and performance | Frequency | ISA Compliance assurance action |
|---|----------------------------|--|
| Remote monitoring data (e.g. vessel position) | Real time | Review by 'Compliance team' for compliance with EMMP |
| Performance reporting of various operational parameters | Real time, weekly, monthly | Review by 'Compliance team' for compliance with EMMP |
| Other reporting (e.g. Contractor audits, Sponsoring State audits) | Quarterly, annually | Review by 'Compliance team' for compliance with EMMP |
| Annual report on environmental performance | Annually | Review by Compliance team for compliance with EMMP |

| | | |
|---|--|--|
| Incident reporting | N/A - as incidents occur | Triggers follow-up actions for Contractor, which will be monitored and reviewed by 'Compliance team' |
| Periodic reporting on long-term environmental effects including from monitoring IRZs, PRZs and APEIs | Annual and five yearly substantive reporting | Review by 'Compliance team' and external scientific experts for compliance with EIS predictions and for compliance with EMMP |
| Checks on measurements of environmental parameters, reporting mechanisms, records and other aspects related to delivery of EMMP | Annually or determined by risk assessment and prioritisation | Audit/Inspection by ISA Inspectors (noting Inspectors role includes many non-environmental aspects) |
| Contractor Environmental Management System review and verification | Annually | Qualified independent expert review of system and adherence with it |

6.4.3 Recommendations

6.4.3.1 Context for Inspections

The ISA should clearly set out the role of 'inspection' as currently envisaged in the wider context of environmental compliance assurance. The ISA should consider environmental auditing (or inspection) as a specialist area to be addressed in a separate manner from broader inspection activities, ideally by an ISA 'compliance team', operating within an 'environment department' reporting to the Secretary-General (as recommended elsewhere in this report).

6.4.3.2 Audit and Inspection Programme – On-going Review

As part of its overall inspection programme, the ISA should have a pre-planned environmental audit and inspection programme for the upcoming year (in detail) and the upcoming five-year period (in outline) for each Contractor (see also 'Targeting and Prioritisation' Section 5.6) but be prepared to amend the programme in any one year based on reviews and assessment of the data received from real-time monitoring and reporting. In developing its programme, the ISA should acknowledge that environment-related inspection activities may require different timings, durations and frequencies from the inspection of other parameters. Escalation (or otherwise) of inspection and auditing should be based on risk analysis on an on-going basis rather than at pre-determined fixed intervals.

6.4.3.3 Composition of Audit Team

The ISA audit and inspection team should include competent and trained environmental auditors from the environment department compliance team working alongside the other disciplines that are required.

6.4.3.4 Capacity Building for Inspection

The ISA could consider including representatives of other Contractors and Sponsoring States in its audit and inspection teams that visit installations, whereby, and subject to the agreement of the Contractor involved, these representatives would have a remit that includes learning and knowledge transfer but excludes any enforcement role. The representatives should be suitably qualified and could for example be drawn from the second country's marine environmental regulator.

6.4.3.5 Permanent On-board Inspectors

Should the ISA or a Sponsoring State decide to go down the route of installing its own resident inspectors or observers (respectively) on board DSM installations then the personnel in question should be qualified, competent, well-trained and suitably remunerated. The ISA inspectors should be rotated between Contractors and should receive prior vetting and on-going support to avoid conflicts of interest.

6.5 THE ROLE OF INDEPENDENT OR THIRD-PARTY VERIFICATION

6.5.1 Learnings from the Case Studies

Independent or third-party verification is aimed at verifying that suitable systems are in place and are being used; it does not verify the actual environmental performance of an operating business.

The regulatory bodies considered in the Case Studies Report were found not to have procedures that involve independent verification of the performance of regulated parties. However, they do generally view those organisations that are ISO 14001 accredited or operating a management system that is aligned with ISO 14001 and independently verified as such, as having their own procedures that include a degree of independent verification. Regulators also respond to public complaints about the environmental performance of businesses. Although not formal third-party verification, the South Africa DEA and Hong Kong EPD both actively encourage the public to report possible instances of non-compliances.

Some practices of the private sector companies are worth noting (above and beyond obtaining ISO 14001 accreditation or having their systems independently verified as being aligned with ISO 14001).

- When BP began planning its liquefied natural gas plant in Indonesia in 2002, it set up an independent panel to monitor its performance in various areas⁸³. The original panel was chaired by US Senator George Mitchell and included Lord David Hannay of Chiswick from the UK, and influential representatives of Indonesian society such as Ambassador Sabam Siagian from Jakarta and the Reverend Herman Saud from Jayapura. The Panel undertook its work by meeting with a wide variety of Indonesian government officials, elected leaders in Jakarta, Jayapura, Manokwari and Aranday, village leaders in Tanah Merah and Taroy, international NGOs in London, Jakarta and Papua and many directly affected Papuans. The Tangguh Independent Advisory Panel continues to review BP's performance in areas such as human rights, security and governance.
- Rio Tinto's managed facilities, whether they are active or inactive, have an 'external engineer of record or design engineer'⁸⁴. A key role of this person is to provide a degree of independent external assurance to Rio Tinto's management.

The EBRD, in common with many other international lending institutions, operates a system (as part of its *Procedures for Environmental and Social Appraisal and Monitoring of Investment Projects*) of independent verification where third-party (i.e. independent) monitoring may be carried out by an

independent consultant, who is approved by the Bank and funded by the client. The independent consultant often gets involved at the EIA stage of a project. The International Finance Corporation (IFC) operates in a similar way but also has an independent accountability mechanism provided by the Compliance Advisor Ombudsman (CAO)⁸⁵. The CAO assesses how the IFC assures itself of environmental and social performance at the project level. Investigations focus on the project, not the project sponsor, and examine compliance with relevant policies, standards, guidelines, procedures, and conditions. CAO compliance investigations are independent of, but complementary to, IFC's internal assurance efforts⁸⁶.

6.5.2 Context for DSM and the ISA

Regulation 46 of the Draft Regulations on Exploitation would require Contractors to develop, implement and maintain an environmental management system which:

- will facilitate the delivery of site-specific environmental objectives and standards in the EMMP;
- can be independently audited by recognised and accredited international (or national) organisations; and
- provides for effective reporting of environmental performance to the ISA.

Other than independent audit of the system itself, it is not currently clear whether any independent verification of actual environmental performance by an independent and expert third-party is required under the ISA's regulatory regime.

6.5.3 Recommendations

6.5.3.1 Independent Verification of Contractor Environmental Management System and Implementation of its System

Following from Regulation 46 of the Draft Regulations on Exploitation, the ISA should require that for each Contract Area, the Contractor has an environmental management system to provide a framework for managing, monitoring and reporting on their environmental performance that is 'aligned with the requirements' of ISO 14001 (although actual accreditation to the standard should not be a requirement as explained in Section 8.4.1) and verified accordingly by an internationally recognised provider. The ISA should also require that the Contractor's adherence to the system is independently verified annually by an internationally recognised provider of verification services.

6.5.3.2 Independent Verification of Sponsoring States Environmental Compliance Assurance System

The ISA should encourage each Sponsoring State to have an environmental compliance assurance system that adequately addresses its responsibilities and liabilities under the Contract, and measures to check it is being followed, which could comprise annual independent verification by an internationally recognised provider of verification services.

6.5.3.3 ISA Ombudsman

The ISA should reinforce its accountability and legitimacy as a steward of the deep-sea environment by setting up an Ombudsman modelled on the independent accountability functions of the International Finance Corporation (IFC) Compliance Advisor Ombudsman (CAO).

6.5.3.4 Second Country or Independent/Joint Surveys and Monitoring

The ISA should encourage collaboration between Contractors in certain monitoring activities, particularly those aimed at monitoring medium- to long-term effects at impact reference and preservation reference zones (and APEIs). This could take the form of exchanging environmental representatives on board survey vessels through to a fully joint scientific survey between two Contractors/Sponsoring States.

6.6 TARGETING AND PRIORITISATION (RISK-BASED APPROACH)

6.6.1 Learnings from the Case Studies

Typically using a risk-based approach or similar, all the organisations reviewed included some degree of prior and pro-active targeting and prioritisation in their approaches to compliance monitoring. Two practices particularly stood out:

- The New Zealand EPA's four-step risk-based approach that considers the environmental consequences of non-compliance alongside the regulated party's attitude to and record of compliance⁸⁷; and
- The MMO's intelligence-led risk-based enforcement process⁸⁸.

The New Zealand EPA also draws on a regulated party's annual environmental monitoring report for priorities for the next year's compliance actions; for example, looking to see if any trends are prominent such as repeated incidents or an escalation in the frequency of a type of incident.

6.6.2 Context for DSM and the ISA

No regulatory body has infinite resources, and so like any other organisation, the ISA will need to be careful to prioritise inspections and other compliance monitoring actions in a proportionate way that represents best use of resources with no regulated party feeling unfairly singled out for attention.

Focusing its compliance monitoring actions will be even more important for the ISA given the remote nature of DSM operations and the associated logistical and cost considerations of conducting monitoring activities. Another factor is potential variation in the environmental performance of Contractors and the capacity of Contractors and Sponsoring States for undertaking compliance activities. It will be important for the ISA to adopt a consistent and objective approach to how it targets its regulatory resources, so that can Contractors can see that they are being treated fairly compared with other Contractors and that any differences in the frequency and intensity of audits and inspections are objectively justified.

DSM activities, like many other projects, will be phased—e.g. mobilisation, commissioning, steady state operation, shutdown and maintenance, demobilisation and closure. Different phases will have different monitoring priorities.

6.6.3 Recommendations

6.6.3.1 Risk-based Approach to Targeting and Prioritisation

In developing its own risk-based approach to environmental compliance monitoring and related activities the ISA should reflect on the risk-based approaches taken by organisations like the MMO and the New Zealand EPA.

6.6.3.2 Risk-based Approach to Initially Planning Audit and Inspection Frequency

The ISA should develop a structured process for determining the initial frequency of audits and inspections applied to a Contractor. The determination criteria should be transparent and communicated in advance to all Contractors and should include a combination of:

- environmental risk, which might vary by geography, type of mining and phase of project; and
- Contractor compliance history (e.g. from the exploration phase); and
- matters that have emerged from whistle blowing and complaints procedures; and
- Contractor attitude to/capacity for compliance (e.g. based on reporting during the exploration phase, quality of management systems).

6.6.3.3 Ongoing Audit and Inspection Programme – Medium- to Long-term Review

On a rolling basis, the ISA should develop medium- to long-term audit and inspection programmes for each Contractor covering the next year in detail and the next five years in outline. The timing, frequency and intensity of audits and inspections should be advised by such matters as an assessment of the compliance record, including incident reporting, for the previous year (e.g. as set out in an annual environmental monitoring report), any seasonal environmental considerations, planned phases of activity and planned higher risk than normal activities. The medium- to long-term audit and inspection programmes should feed into the ISA Strategic Plan regarding such matters as staffing, funding and targets for annual performance reviews.

6.7 DATA MANAGEMENT

6.7.1 Learnings from the Case Studies

Monitoring is the start of a process that will generate significant amounts of data. Data management is a material issue in environmental compliance assurance above and beyond the core function of the data being used to demonstrate compliance.

Data are therefore a significant asset to an organisation, and the means of data management assume great importance in environmental compliance assurance systems. One example is the Environmental and Emissions Monitoring System (EEMS), the environmental database of the UK oil and gas industry. The database is a repository for measured and calculated data of emissions and discharges from offshore oil and gas exploration and production facilities on the UK continental shelf⁸⁹.

6.7.2 Context for DSM and the ISA

The ISA presented its Data Management Strategy, the development of its database and its data web portal, together with progress made in moving forward towards the training and policy development phase of the strategy, to member States during its 24th session meetings in July 2018⁹⁰.

The data management system will include the culmination of the migration of all historical data provided by Contractors into geo-referenced data in digital format (see DeepData⁹¹). The digital database is intended to support the various phases of the data management life cycle for DSM. It is also envisaged to include data collected during deep-sea scientific research by international institutions, as well as being used as a management and research tool by stakeholders. Secured and general access will be enabled for Contractors, the scientific community and the general public.

In addition to its role in demonstrating compliance, the data from monitoring DSM activities will have other value to the ISA in terms of such matters as:

- adding to knowledge of the baseline environment;
- facilitating the ISA's role in promoting and encouraging marine scientific research;
- adding to the evidence base of the impacts and effects of DSM;
- inputs to the assessment of regional/cumulative effects of DSM;
- providing useful information for various scientific research activities;
- transparency; and
- evidence for enforcement actions.

Regulation 3 of the Draft Regulations on Exploitation and Strategic Direction 4 of the Strategic Plan of the ISA (2019 to 2023) both address the sharing of results and data (among other matters). However, draft Regulation 89 does make provision for environmental information to be retained as confidential by a Contractor under some circumstances.

6.7.3 Recommendations

6.7.3.1 Data Management and Transparency

The ISA should adopt data management practices that recognise the importance of transparency; this is also discussed in Section 7.2. For example, the ISA's rules should designate all 'environmental data' as non-confidential as a default and should set reporting requirements that delineate properly between environmental information and commercially sensitive operational information so that environmental information can be readily disclosed and shared. What comprises environmental data should be clearly defined, to include e.g. all EIA baseline information, all monitoring data produced in the course of implementing EMMPs (see also Recommendation on 'Data Access and Availability'), all environmental incident reports and lessons learned from investigating the incident, the results of environmental inspections and audits. Where exceptions to rules are deemed to be necessary the ISA should establish clear criteria so that all parties are aware in advance as opposed to decisions being made on a case-by-case basis.

6.7.3.2 Data Access and Availability

Compliance monitoring data provided by Contractors to the ISA should be publicly accessible via the internet to ensure transparency (and enable additional application and use by academia and other stakeholders). The data should be maintained in a raw format (i.e. not as 'pdf' or 'picture' files) in the ISA data management system for it to be available for scientists to use. Interpretative reports should be worded and formatted to include non-technical summary information for the lay person as well as more detailed analysis to inform and engage the scientific community.

6.7.3.3 General Management of Data

The ISA should develop a compliance monitoring data management strategy as it evolves its overall data management strategy, which addresses the following:

- *format of data;*
- *the flow of compliance monitoring data to the ISA data management system (e.g. DeepData);*
- *the use of data in other aspects of compliance (compliance promotion, evidence base, reporting and enforcement);*

- *checks on the quality of incoming data;*
- *tracking the movement of compliance monitoring data through the system to feed data that are needed for ISA decisions to the right place;*
- *data provenance in that it may be later used as evidence in an enforcement process;*
- *aggregating data generated from multiple single Contract operations up to a regional data set, e.g. to monitor and understand cumulative effects;*
- *making provisions for licensing of data use;*
- *focused training for staff in data management, use and flows of information through the organisation; and*
- *publication of the data.*

7 COMPLIANCE ENFORCEMENT

7.1 INTRODUCTION

The table below lists aspects and characteristics of an organisation's approach to compliance enforcement and signposts the case studies that address these, indicating those that embody good practice. The section number references in the table are those for the Case Studies Report.

Although enforcement is made up of administrative enforcement, criminal enforcement and possibly other sanctions, the actual approach observed within each organisation reviewed was a progressive one escalating in the event of repeat or unaddressed non-compliance. Setting the severity of sanctions was generally related to the significance of the nature of the non-compliance.

| | South Africa DEA | Hong Kong EPD | New Zealand EPA | MMO | PNA | Mining | Oil and Gas | EBRD |
|--|---------------------|------------------|--------------------|-------|-----|--------|-------------|------|
| Overall approach to compliance enforcement | | 3.5.1 | 4.5.1 | | | | | |
| Approach to criminal enforcement | | 3.5.3 | 4.5.3 | 5.5.3 | | | | |
| Other sanctions | | | | | | | | |

7.2 OVERALL APPROACH TO COMPLIANCE ENFORCEMENT

7.2.1 Learnings from the Case Studies

All the regulatory organisations reviewed in the Case Studies Report adopt enforcement practices that include administrative actions, financial penalties and court actions that can lead to fines and/or imprisonment. Typically, enforcement can be viewed as a sliding scale of actions from 'light' administrative enforcement through to criminal enforcement. However, in all cases court action is seen as a last resort and undertaken with due consideration.

Administrative actions are made up of a range of options, including:

- correspondence or meetings on specific matters/minor non-compliances;
- changing the frequency of the inspection schedule;
- automatic penalties;
- varying or placing additional conditions on a consent;
- emergency safety notices;
- remediation notices;
- variation notices;
- suspension notices to cease operations; and
- revocation of licence.

Many of these have direct and indirect financial consequences for a regulated party. In transparent compliance regimes they can also have reputational consequences.

Some regulatory organisations also have specific powers in investigating and gathering evidence which can include:

- questioning witnesses;
- inspecting and removing evidence;
- entering and searching business premises and facilities;
- requiring production of documentation for inspection;
- seizing items, including computers; and
- detaining vessels or marine installations.

The New Zealand EPA adopts a process, when a non-compliance is detected, of investigating and working with the regulated party to ensure the environment is protected from damage and a return to compliance is prioritised. Initially the approach to enforcement is therefore a collaborative one of helping the regulated party to achieve or return to compliance. It is only thereafter that more formal administrative and, in the last resort, criminal enforcement actions are taken in accordance with the EPA's compliance policy document⁹².

In the private sector, enforcement is a different process typically aimed at staff and contractors. Ultimate sanctions are termination of staff and contracts and removal of contractors from approved suppliers' lists.

Where the EBRD is concerned the ultimate sanction for serious non-compliance with the terms of an agreement can be to withhold the disbursement of funds (Procedures for Environmental and Social Appraisal and Monitoring of Investment Projects⁹³).

6.2.2 Context for DSM and the ISA

Part XI of the Draft Regulations on Exploitation addresses inspection, compliance and enforcement. For example, draft Regulation 103 part 6 states:

In the case of any violation of an exploitation contract, or in lieu of suspension or termination under paragraph 5 above, the Council may impose upon a Contractor monetary penalties proportionate to the seriousness of the violation.

Draft Regulation 103 also sets out the role of 'Compliance Notices' and outlines how enforcement actions may be escalated. Paragraph 7 of the draft regulation states that: *the Council may not execute a decision involving monetary penalties, suspension or termination until the Contractor has been accorded a reasonable opportunity to exhaust the judicial remedies available to it pursuant to section 5 of Part XI to the Convention*. This effectively means that a compliance enforcement action involving monetary penalties cannot be taken without a referral to and decision by the Seabed Disputes Chamber of the International Tribunal for the Law of the Sea.

ISA inspectors will have investigating powers and be able to gather evidence (e.g. under Regulation 98 of the Draft Regulations on Exploitation).

Contractors, Sponsoring States, Contracting States, Flag States, the Enterprise and joint ventures may all be subject to enforcement actions and/or have responsibilities for compliance enforcement themselves.

6.2.3 Recommendations

6.2.3.1 Compliance Enforcement Strategy

The ISA should develop a 'compliance enforcement strategy'. The strategy should set out progressive actions to be taken with the objective of initial dialogue and actions in advance of a formal compliance notice and avoiding, if at all possible, escalating enforcement to its latter stages of suspension, monetary penalties, revocation of Contract and referring criminal prosecution to Sponsoring States.

The enforcement strategy should set out:

- the triggers for action such as non-compliance of a Contract requirement (e.g. failure or substantial delay in providing reports), breach of a standard or reported performance data trending towards a future breach;
- initial actions of dialogue and engagement between ISA compliance officers and the Contractor that could be taken before a formal compliance notice needs to be issued;
- the establishment of an 'environmental improvement' plan (or similar) agreed with the Contractor to be included in the Compliance Notice issued by the ISA (as per Regulation 103 of the Draft Regulations on Exploitation);
- in the event of non-compliance with the 'environmental improvement plan' or actions are unsuccessful, then the issue of a suspension notice for the element of the activity involved in the non-compliance (this may or may not cause overall production to cease), followed by another period in which to complete corrective action before the activity can recommence; and
- for continued non-compliance, escalation through to the latter levels of enforcement (full suspension of activity on the Contract Area, monetary penalties etc).

6.2.3.2 Environmental Improvement Plan

The ISA should include an 'environmental improvement plan' (or similar) as part of its compliance notice process. The plan should be based on dialogue with the Contractor and agreed between the ISA, the Sponsoring State and the Contractor. It should set out in detail the actions to be taken to return to compliance, how their effectiveness will be monitored and reported, the time scales, and the subsequent steps should the actions be unsuccessful, or should non-compliance continue.

6.2.3.3 Financial Penalties

The ISA should publish an indicative range of monetary penalties linked to defined examples of breaches of compliance. The ISA should make clear that these are indicative, and the actual penalty applied may vary and will have added to it the investigative and legal costs incurred by the ISA. The monetary penalties should be sufficiently high as to act as meaningful deterrents to non-compliance.

6.2.3.4 Contractor, Contracting State and Flag State Compliance Enforcement Strategies

The ISA should require Contractors, and encourage Sponsoring States and Flag States, to prepare and operate compliance enforcement strategies that are aligned with that of the ISA. Where Contractors, Sponsoring States, and Flag States lack the capacity for compliance enforcement to the level required or recommended by the ISA, capacity building actions should be built into the strategy and reviewed at least annually. It is noted that Sponsoring States may set higher environmental compliance enforcement standards should they so wish.

6.2.3.5 Disputes Referred to the Seabed Disputes Chamber of the International Tribunal for the Law of the Sea

During the course of a dispute resolution process involving the Seabed Disputes Chamber of the International Tribunal for the Law of the Sea, the ISA should require a Contractor to cease its extraction operations if the subject of the dispute is related to environmental performance and could lead to impacts greater than or different from those predicted in the EIA and addressed in the EMMP.

6.2.3.6 Compliance Enforcement Responsibility

Where multiple parties are involved with a Contract the ISA should set out clear protocols within the Contract on the environmental compliance assurance responsibilities of the different parties involved (e.g. the Contractor, the Sponsoring State, the Flag State).

7.3 APPROACH TO CRIMINAL ENFORCEMENT

7.3.1 Learnings from the Case Studies

As noted above, criminal enforcement in terms of prosecution in a court of law is seen as a last resort, but a clearly required course of action for a regulator to be able to adopt as part of its overall enforcement powers. Criminal prosecutions are regarded as an important tool in discouraging non-compliance, both by the potential offender directly concerned and the rest of the regulated community.

The Hong Kong EPD and the New Zealand EPA undertake criminal enforcement actions in line with clearly developed policies, respectively 'Statement of Prosecution Policy for the Environmental Protection Department' (Hong Kong EPD)⁹⁴ and 'Prosecution Policy' (New Zealand EPA)⁹⁵.

The regulators reviewed in the Case Studies Report either have powers to launch prosecutions and/or have processes for their compliance staff to work closely with those leading the prosecutions. The MMO has powers as a public prosecutor under UK law (the Marine and Coastal Access Act 2009)⁹⁶. The Hong Kong EPD launches prosecutions through its Central Prosecution Unit, which makes the ultimate decision whether to proceed or otherwise⁹⁷. In South Africa all cases are delivered over to the National Prosecuting Authority (NPA) for prosecution; however, the South Africa DEA's Environmental Management Inspectorate works closely with prosecutors in taking a case forward⁹⁸. The New Zealand EPA's Prosecution Policy sets out the role of other parties, e.g. Solicitor-General's office, that are involved together with the EPA in criminal enforcement actions⁹⁹.

Where industrial and resource extraction activities are concerned, all the regulators apply certain criteria to determine the importance of the non-compliance or breach of regulations. These criteria include one or more of the following:

- involvement of heavy pollution loads and/or highly hazardous materials;
- high potential for harming public health;
- high risk to a sensitive environment and/or damage to it;
- repetitive non-compliance;
- significant unlawful profit (e.g. to the point of rendering automatic financial penalties meaningless); and

- causing a disruption of the market concerned to the disadvantage of operators who comply with the regulations.

While the above factors may trigger the consideration of whether to prosecute or take another course of action, some regulators apply further tests. For example, the New Zealand EPA (under its Prosecution Policy¹⁰⁰) and the MMO¹⁰¹ will only initiate court proceedings if:

- the evidence is sufficient to provide a reasonable prospect of conviction (the ‘Evidential’ test, which is considered first); and
- a prosecution is required in the public interest (the ‘Public Interest’ test).

With the New Zealand EPA, a prosecution may not necessarily always proceed, even when both tests are met, if it considers that a different compliance enforcement response is more appropriate.

The Hong Kong EPD also regards the decision to prosecute for an environmental offence as an important one, with the decision to prosecute only taken after the evidence and related factors have been fully evaluated. Since the basis for a possible prosecution may have been brought forward by a member of the public or a community, the EPD’s decisions on proceeding (or not) with prosecutions are transparent¹⁰².

6.3.2 Context for DSM and the ISA

As the ISA is not a sovereign entity, there is no mechanism under UNCLOS or the Draft Regulations on Exploitation through which it could initiate a criminal prosecution. Any criminal prosecution would need to be pursued by (and within the domestic legal system of) a Sponsoring State, as is noted in ‘Comparative Study of the Existing National Legislation on Deep Seabed Mining’.

“In connection with the requirement for sponsoring States to assist the Authority by taking all necessary measures to ensure compliance, individual States have the power to put in place measures which the Authority cannot. These include, as evident from this review, the creation of offences and the imposition of civil and criminal sanctions”¹⁰³.

As the ultimate sanction in an enforcement strategy for DSM this raises serious difficulties for the following reasons.

- Variations among the criminal justice systems (both in terms of procedural aspects and capacity) in the Sponsoring States (and Flag States where relevant) means that different Contractors may not be treated equally for the same ‘crime’.
- In some instances, the State will be the ‘Contractor’.
- Many States lack the capacity and/or will to prosecute vessels under their jurisdiction.

6.3.3 Recommendations

6.3.3.1 Sponsoring State

In order to move towards consistency in compliance enforcement, the ISA should encourage Sponsoring States, collectively, to identify what regime of criminal sanctions may be appropriate within their domestic legal regimes, for activities in the Area. Sponsoring States should be encouraged to harmonise their laws and practices in this regard. The ISA could consider requiring at Contract application stage a description of the Sponsoring State compliance regimes, including recourse to criminal prosecutions.

6.3.3.2 Enhanced Non-criminal Sanctions

In the absence of criminal prosecution as a sanction the ISA should give careful consideration to other sanctions available to it (e.g. monetary penalties, suspension and revocation of Contract). These sanctions should be developed in detail, including the triggers for implementing them, so that Contractors see them in compliance terms as being as serious as criminal enforcement sanctions.

7.4 OTHER SANCTIONS

7.4.1 Learnings from the Case Studies

In many regulatory regimes one reason for monitoring is to validate the findings of an EIA. This is important as the regulator bases its decisions to approve a proposed activity (or otherwise to refuse approval) on the EIA and also bases many of its approval conditions on the EIA (and EMMP). In extreme instances, reassessment of certain impacts can be required where monitoring shows material deviations from the originally predicted effect (e.g. due to the impact being greater than envisaged or the mitigation less effective) or reveals previously unforeseen effects for which no mitigation measures are in place.

For the private sector companies reviewed in the Case Studies Report, serious non-compliance with codes of conduct (or similar) and regulatory restrictions, including on environmental matters is regarded as an issue that could result in termination of a person's employment or of a sub-contractor's contract.

Dissemination by a regulator to the public of a reputable private sector company's non-compliance record is regarded as a significant reputation issue by such companies, which is influential as it may affect their shareholder or investor confidence.

6.4.2 Context for DSM and the ISA

In the context of uncertainty and a strong element of adaptive management being contained in overall environmental management and environmental compliance assurance processes, validating the EIA will be an important exercise for DSM projects.

As noted above, the ISA is unlikely to be able to use criminal prosecution as an enforcement action and so other sanctions are likely to become more important.

6.4.3 Recommendations

6.4.3.1 Update EIA and EMMP

In the event that monitoring shows that the basis for an EIA finding was materially flawed (e.g. the sediment plume model vastly underestimated the actual plume extent) and as a result some of the Contract conditions were invalidated, the EIA work involved and all the conclusions stemming from it within the EIA and EMMP should be revisited. In the event that the EIA flaws could lead to serious harm to the marine environment, the ISA should consider revoking the Contract until such time as a revised EIA and EMMP, or elements thereof, were submitted and approved.

6.4.3.2 Public Compliance Records

The ISA should publish the compliance records of all Contractors so that these are transparent to stakeholders including potential procurers of Contractor production and others further along the supply chain, such as major international companies with ethical procurement policies.

6.4.3.3 List of Approved Suppliers

The ISA should require Contractors to provide lists of their key approved suppliers of goods and services together with the compliance records of these suppliers. A 'key supplier' could be one whose goods or services might have a significant influence on environmental performance in the Area. Contractors should be required to justify to the ISA their reasons for continuing to use key suppliers with a poor environmental compliance record and the active steps (such as capacity building) they are taking to improve matters.

8 PUBLIC REPORTING, ACCOUNTABILITY AND TRANSPARENCY

8.1 INTRODUCTION

The table below lists aspects and characteristics of an organisation's approach to public reporting, accountability and transparency and signposts the case studies that address these, indicating those that embody good practice. The section number references in the table are those for the Case Studies Report.

'Public Reporting' is considered in this report in a very broad context as information an organisation provides to the public or that the public can readily access; i.e. it is not just an 'annual performance report'. Providing public access to information is a key aspect of transparency and allowing an organisation to be accountable to public stakeholders.

| | South Africa DEA | Hong Kong EPD | New Zealand EPA | MMO | PNA | Mining | Oil and Gas | EBRD |
|---|---------------------|------------------|--------------------|-------|-----|--------|-------------|-------|
| Overall scope and transparency of reporting | | 3.6.3 | 4.6.3 | 5.6.3 | | | | 9.6.3 |
| Annual performance reporting | 2.6.3 | | 4.6.2 | 5.6.2 | | 7.6.3 | 8.6.3 | 9.6.3 |
| Whistle blowing | | | | 5.6.4 | | 7.6.4 | 8.6.4 | |
| Complaints procedures | | | | | | 8.6.5 | 7.6.5 | 9.6.5 |

8.2 OVERALL SCOPE AND TRANSPARENCY OF REPORTING

8.2.1 Learnings from the Case Studies

All the organisations reviewed in the Case Studies Report provided environmental compliance assurance related materials with some degree of transparency but with some variability.

Private sector companies tended only to provide information on environmental performance and compliance at an operating business or project level where to do so was a procedural requirement of either the host-country or an international finance institution lending to the project (or both). Generally, the public reporting on environmental performance by private sector companies is in the form of an annual 'sustainability' report (or similar) covering its worldwide operations.

The EBRD provides access to all EIA documentation for projects that are applying to the bank for funding, based on information that has been provided by the project sponsor to the satisfaction of the EBRD¹⁰⁴. However, during implementation of projects, it appears that only some projects report compliance issues from monitoring and audits (including details of non-compliance, details of remedial action etc) on their company websites.

Of the regulators, the practices of the New Zealand EPA and Hong Kong EPD stand out.

- With few exceptions (for example, documents restricted by the Official Information Act, or otherwise considered to include sensitive information under the EEZ Act), the New Zealand EPA publishes all the documentation associated with ‘notified’ applications and EIAs for marine consents, including external advice and reports, evidence reports and witness statements, including technical documents and reviews prepared by the applicant and other interested parties. Decision reports are published providing the background to the application, the post-submission process and outcomes and the rationale for the EPA’s decision¹⁰⁵.
- In addition to publishing all EIA related documentation, the Hong Kong EPD also publishes the environmental monitoring and audit programmes for projects, and the results of the monitoring and auditing that have been conducted for them¹⁰⁶.

In most mature environmental regulatory frameworks, the EIA process is one that includes:

- prior and informed consultation with stakeholders starting with EIA scoping and continuing on through conduct of the EIA, preparation of the EIA Report, and submission and review of the Report;
- public access to all EIA-related documents (including monitoring and audit plans);
- and a transparent process for determining an application that includes public participation.

It is also recognised that a combination of EIA studies, public participation and regulator determination set the duration of the overall process. For example, for a marine energy project in the UK this could be 50 months from start to finish.

UK process for Nationally Significant Infrastructure Projects

1. Scoping phase: 3 to 6 months or more depending on complexity
2. Scoping consultation: 6 weeks
3. EIA and preparation of Preliminary Environmental Information Report (PEIR – effectively a draft ES): timescale primarily dictated by collection of baseline data, typically more than two years for marine projects
4. PEIR consultation: 5 weeks
5. Preparation of Environmental Statement (ES): approximately 6 months but variable
6. Determination:
 - Acceptance and pre-examination: circa 3 months
 - Examination including public hearings: 6 months
 - Inspector’s report: 3 months
 - Secretary of State decision: 3 months

Typical total: circa 50 months (for offshore energy projects).

In most mature regulatory frameworks, monitoring reports (including audits and inspections) of the environmental performance of a project (from the construction phase onwards) are also publicly available. Compliance enforcement actions are also a matter of public record. These approaches, in combination, can be considered as best practice in terms of transparency and accountability to the public through the life cycle of a project from EIA at the planning stage to reporting environmental performance during operation.

8.2.2 Context for DSM and the ISA

EISs and EMMPs prepared by ISA Contractors in accordance with the Draft Regulations on Exploitation, and incorporating an element of public participation in the process, will be a critical

stage in the environmental compliance assurance process in that they will provide input to the compliance requirements of a Contractor (see also Section 2.2.3).

The ISA has not to date published contracts and plans of work, Contractor annual reports, or compliance information. The ISA does publish on its website copies of the papers before the Council and the Assembly, which include some summary reports from the Secretary-General¹⁰⁷ and the Chair of the LTC¹⁰⁸. These may point to instances of non-compliance but do so in a general and anonymised way.

8.2.3 Recommendations

8.2.3.1 Language of Information and Documents

All key documents (to be defined by the ISA) and information provided in the cause of transparency and accountability should be made available in the working of the ISA as a matter of course, and upon request in other official languages of the ISA for other documents. The costs for the provision of such documents should be borne by the Contractor.

8.2.3.2 EIA Approval Process – Transparency and Accountability

Transparency and accountability in the EIA process should begin with the publication of a scoping report and public input to the EIA terms of reference. Thereafter the ISA should publish all the documentation associated with applications and EIAs by Contractors (save for any non-environmental information deemed confidential by the Council), including external advice and reports, evidence reports and expert statements, together with other technical documents and reviews prepared by the Contractor and any other interested parties. ISA ‘decision reports’ should be published providing the background to the application, the post-submission process and outcomes and the rationale for the ISA’s decision.

8.2.3.3 EIA Approval Process – Realistic Timeframes

The EIA process (including scoping) performed by the Contractor, and the EIA document review and Contract approval processes performed by the ISA should include realistic timeframes for prior and informed public consultation and public participation in the processes and sufficient time for expert review of the documents to advise the ISA’s determination process.

8.2.3.4 Information to be Made Publicly Available by Contractors and the ISA

The ISA should make the following documents available for pre-approval public consultation (noting that provision for some of these to be made public is included in the Draft Regulations on Exploitation):

- EIA Scoping Report;
- Draft EIS, including all technical support documents;
- Draft EMMP;
- technical expert advice studies and materials requested and prepared by the ISA, the Contractors and any other relevant parties during the approval process.

The ISA should make the following documents available for post approval accountability (noting that provision for some of these to be made public is included in the Draft Regulations on Exploitation):

- Contracts and plans of works, including Final EIS;
- Final EMMP;

- Contractor monitoring data and reports (on-going, periodic) and Interpretative reports (annual and longer-term trends);
- Contractor annual reports;
- environmental management performance reports;
- ISA audit and inspection reports;
- findings of periodic reviews of plans of works;
- incident reports;
- compliance notices;
- environmental improvement plans (where applicable); and
- enforcement actions.

8.2.3.5 Enforcement of Reporting Requirements

Failure by a Contractor or Sponsoring State to meet reporting requirements in terms of content, timing and public accessibility should be addressed by appropriate ISA compliance enforcement actions as set out in an environmental compliance assurance strategy.

8.3 ANNUAL PERFORMANCE REPORTING

8.3.1 Learnings from the Case Studies

In relation to annual performance reports, the organisations reviewed in the Case Studies Report provided information as follows.

- Regulators provided information on how they had performed in terms of their statutory functions, including their environmental compliance assurance activities.
- Private sector companies reported on their sustainability (environmental, social etc) performance against certain key indicators.
- The EBRD provided quantitative and qualitative information on the impacts and outcomes of its activities and the projects it is financing.

Both the private sector companies and the EBRD prepare their reports in line with the Global Reporting Initiative, which can be regarded as an international standard for such reporting. The private sector companies also have their reports independently verified.

The regulators' annual reports generally provided information on their activities over the preceding year, plans for the year ahead, and performance review, including for environmental compliance assurance activities. Financial information and budgeting data were also provided for their various programmes. The reports were usually backed up by additional information referenced in them, but which could be found elsewhere. The annual reporting of the New Zealand EPA and the South Africa DEA are noteworthy.

- The New Zealand EPA's annual report is underpinned by a Statement of Performance Expectations¹⁰⁹ which provides greater detail on the organisation's performance versus indicators set out in a performance framework. The performance framework links the EPA's activities in any one year with longer-term outcomes relating to the EPA's Strategy. These are important documents in terms of the accountability of the organisation to the New Zealand public.
- The South Africa DEA's annual report is similarly supported by Strategic Plans/ Annual Performance Plans¹¹⁰. The plans look ahead to the coming years and drill down to programme

level (e.g. 'Legal Authorisations Compliance and Enforcement') and each programme (with breakdown to quarterly targets) also includes previous years' performances and corrective actions for where previous performance fell short of targets. The Legal Authorisations Compliance and Enforcement Inspectorate also publishes an annual report specifically on compliance: The National Environmental Compliance and Enforcement Report (NECER)¹¹¹.

8.3.2 Context for DSM and the ISA

Taking all of humankind as a stakeholder group, annual reporting of a Contractor's environmental performance will need to be accessible by a range of interest groups with differing levels of scientific expertise and understanding of DSM issues.

The performance of the ISA as a regulator will also be a matter of legitimate interest among a broad group of stakeholders.

8.3.3 Recommendations

8.3.3.1 Contractor Annual Sustainability Reporting

In addition to the reporting (as noted above) of monitoring data and providing reports of scientific interpretation of the data, the ISA should require Contractors to produce an annual 'sustainability' report (or similar) for a broad non-technical audience. The ISA should provide general guidance on the report content and the key indicators to be reported (or alternatively refer to the standards set out by the Global Reporting Initiative¹¹²). The report should be independently verified by a recognised international provider.

8.3.3.2 ISA Annual Compliance Review Report

The ISA should report annually on how the organisation has performed against the targets and expectations set out in its strategic compliance plan and annual performance plan.

8.4 WHISTLE BLOWING

8.4.1 Learnings from the Case Studies

Many organisations reviewed in the Case Studies Report placed importance upon effective whistle blowing procedures and being seen to act on whistle blowing reports. Organisations without such mechanisms are often vulnerable to staff and contractors releasing information to the media.

The private sector companies reviewed had well-established mechanisms for whistle blowing and raising issues of concern in complete confidence. Generally, these mechanisms were open to all staff, contractors and the public (often in addition to separate complaints or grievance mechanisms that also exist for use by the public, especially neighbouring communities to operations and projects) (see also Sections 7.6.4 and 8.6.4 of the Case Studies Report).

The MMO operates a formal whistle blowing policy for its staff (Disclosures in the Public Interest (Whistleblowing) Policy and Procedure¹¹³). All the regulators' whistle blowing procedures focused mainly on enabling the public to report transgressions by businesses, industrial operations and others.

8.4.2 Context for DSM and the ISA

A complaints mechanism is a key aspect of transparency and accountability. However, it is only valid when an operator's actions are evident first-hand to prospective complainants. DSM will take place in remote locations where there is no 'local community' to be affected and in many locations where there will be no other proprietary interests (such as fishing). This places greater emphasis on the need for whistle blowing procedures within the ISA regime.

8.4.3 Recommendations

8.4.3.1 ISA Whistle Blowing Policy and Procedures

The ISA should develop and implement a whistle blowing policy for its own staff, contractors and external expert advisers. Implementation of the policy should include a mechanism that allows matters to be raised in complete confidence and anonymity (possibly through an ISA ombudsman or similar).

8.4.3.2 Contractor and Sponsoring State Whistle Blowing Policy and Procedures

The ISA should require Contractors and encourage Sponsoring States to develop and implement whistle blowing policies for their own staff, Contractors, national regulators and other parties involved in DSM. Implementation of the policy should include a mechanism that allows environment-related matters to be raised directly with the ISA (via the Secretary-General) in complete confidence and anonymity. A matter raised through whistle blowing should be investigated and validated by an ISA environmental compliance assurance team (or similar) through its normal environmental compliance assurance processes and escalated through the enforcement stages to the extent necessary.

8.5 COMPLAINTS PROCEDURES

8.5.1 Learnings from the Case Studies

A complaints procedure for the public is needed as part of a valid environmental compliance assurance practice.

Some regulators have complaints procedures which are aimed at allowing their 'customers' (i.e. regulated parties, applicants (for licences, permits etc) and the general public to lodge complaints about the service received.

The EBRD operates a formal Project Complaint Mechanism (PCM)¹¹⁴, which is governed by a set of rules on how a complaint may be filed and how it will be processed, together with other requirements such as timelines. Complaints may originate from parties in areas affected by bank-funded projects, including those with economic, social and cultural interests. Administration of the PCM is independent from the EBRD's banking operations and the Environment and Sustainability Department. In addition, projects funded by the bank are required to operate formal grievance mechanisms for the benefit of local communities and other stakeholders.

The private sector companies operate formal complaints mechanisms. These are usually run at the operating business and project levels, primarily for local communities to raise concerns and provide feedback (see also Sections 7.6.5 and 8.6.5 of the Case Studies Report).

8.5.2 Context for DSM and the ISA

A complaints mechanism is a key aspect of transparency and accountability. However, for DSM it might be limited in its relevance, for example to locations where other proprietary interests, such as fishing or scientific research, are present.

8.5.3 Recommendations

8.5.3.1 Project Complaints Mechanism

The ISA should establish a formal project complaints mechanism for the ‘public’ to express a concern over some aspect of environmental performance, which sets out how a complaint should be registered and how it will be processed, together with other requirements such as timelines for response, actions and feedback to the party registering the complaint. The complaint mechanism should be based on international good practice guidance such as that of the International Finance Corporation (IFC)¹¹⁵. Administration of the mechanism should be independent from the ISA’s general operations and the environmental compliance assurance team.

8.5.3.2 Broadcasting the Project Complaints Mechanism

For any one project (i.e. Contract Area) the other sea user groups that could be affected should be identified and confirmed by the Contractor during the EIA process. Once identified and engaged in the EIA process they should be proactively informed by the ISA of the project complaints mechanism.

9 ASSESSING EFFECTIVENESS

9.1 INTRODUCTION

The table below lists aspects and characteristics of an organisation's approach to assessing its effectiveness and signposts the case studies that address these, indicating those that embody good practice. The section number references in the table are those for the Case Studies Report.

| | South Africa DEA | Hong Kong EPD | New Zealand EPA | MIMO | PNA | Mining | Oil and Gas | EBRD |
|-------------------------------|---------------------|------------------|--------------------|-------|-------|--------|-------------|------|
| Internal assessment practices | 2.7.1 | | 4.7.1 | 5.7.1 | | 7.7.1 | 8.7.1 | |
| External assessment practices | | | 4.7.2 | | 6.7.2 | 7.7.2 | 8.7.2 | |

9.2 GENERAL CONSIDERATIONS

9.2.1 Learnings from the Case Studies

The ultimate assessment of the effectiveness of environmental compliance assurance actions is the extent to which they have led to a reduction in adverse effects on the environment. Although this type of effectiveness can be measured, the more complex the activity or effects on the environment, the more difficult it becomes to measure and attribute positive or negative environmental outcomes to environmental compliance assurance in general and to specific actions in particular. These difficulties and other challenges are noted in Organisation for Economic Co-operation and Development (OECD) Environment Working Papers, No. 18: 'Outcome Performance Measures of Environmental Compliance Assurance, Current Practices, Constraints and Ways Forward'¹¹⁶.

As a result, most organisations undertake an internal assessment of how effective they have been in delivering their environmental compliance assurance actions by assessing their performance against a set of indicators established periodically in advance (e.g. annually), which are aimed in turn at achieving desired environmental outcomes. Some organisations also allow their performance to be externally assessed or reviewed. A combination of internal and external/independent assessment may be considered to be best practice.

9.2.2 Context for DSM and the ISA

There will be at least three sets of organisations undertaking environmental compliance assurance for DSM: the ISA, the Contractors, and the Sponsoring State.

DSM will be a new activity and there are likely to be new approaches to environmental compliance assurance involved; this raises the importance of organisations subjecting their effectiveness to internal and external assessment.

9.2.3 Recommendations

9.2.3.1 Both Internal and External Assessment - ISA

The ISA should establish a transparent process of reviewing, through both internal and external assessments, the progress of its environmental compliance assurance practices against the annual performance plan (including key performance indicators approved by the Council) and report the assessment outcomes to stakeholders accordingly.

9.2.3.2 Both Internal and External Assessment – Other Parties

The ISA should require Contractors and encourage Sponsoring States to review, through internal and external assessments, how effective their environmental compliance assurance practices are and report the assessment outcomes to the ISA and stakeholders accordingly.

9.3 INTERNAL ASSESSMENT PRACTICES

9.3.1 Learnings from the Case Studies

As noted in Section 7.3, both the New Zealand EPA and the South Africa DEA report their performance in the context of targets set for the year ahead (and for the medium-term) in strategic plans and performance plans. The environmental compliance assurance actions of these organisations can therefore be assessed against these targets.

The MMO sets out in an Action Plan¹¹⁷ for a coming year how it intends to contribute to the UK Government's vision for "clean, healthy, safe, productive and biologically diverse oceans and seas". The MMO's contribution towards delivering this vision is considered in terms of marine planning, marine licensing, marine conservation and other strategic environmental objectives. For a review year, the MMO identifies a range of measures and associated key performance indicators to monitor and measure performance in support of the strategic objectives and track delivery against the Action Plan. The on-going review adopts a 'live touch dashboard' approach in which heads of functions review the dashboard monthly to gain assurance that compliance actions are appropriate to the compliance risks and where necessary escalate compliance issues to a 'delivery review group' meeting quarterly (further escalation to the Board can take place if necessary). These reviews can result in a change in emphasis of environmental compliance assurance actions during the year rather than waiting until the results of a year-end review. In this way, it is possible to indirectly link certain desired environmental outcomes to environmental compliance assurance activities, and thereafter monitor and review the activities.

The practice described above (or similar) seems common to most regulatory organisations and probably reflects the multitude and complexity of their regulatory activities along with external factors outside their control that can affect environmental outcomes.

The private sector companies review the effectiveness of their environmental compliance assurance actions in a systematic and on-going manner with regular reviews that include the involvement of senior management. For example, in one company the environmental compliance system is organised such that the process of proactively identifying compliance issues, setting compliance tasks, tracking tasks and documenting closure is systematic and continuous. The frequency may vary from region to region depending on the legal regime. The effectiveness of the process can be readily checked at any point in time.

9.3.2 Context for DSM and the ISA

The ISA's environmental compliance assurance processes and the ISA body charged with implementing the processes will be untested until DSM starts and in the early years may need to respond and adapt quickly to unforeseen challenges and events. Annual reviews or five-yearly reviews will be inadequate in terms of being able to properly respond to rapid changes in circumstances that require new or different compliance actions, staff numbers etc.

Under Article 154 of UNCLOS (periodic review) the ISA Assembly is required to *“undertake a general and systematic review of the manner in which the international regime of the Area established in this Convention has operated in practice. In the light of this review the Assembly may take, or recommend that other organs take, measures in accordance with the provisions and procedures of this Part and the Annexes relating thereto which will lead to the improvement of the operation of the regime.”* Some findings of the most recent Article 154 review are summarised below¹¹⁸.

A periodic review of the ISA pursuant to Article 154 of UNCLOS was initiated by the Assembly in July 2015 and reported on in February 2017. The review was carried out under the oversight of a review committee made up of the President and the Bureau of the Assembly and the President of the Council; the chairs of the regional groups who might participate as observers in the Review Committee; the President of the 21st session of the Assembly remained a member of the Review Committee until the completion of the review. The Assembly also decided that the review should be carried out by independent consultants appointed by the Review Committee. The scope of the review covered, but was not limited to, environment-related matters.

The review conducted by the independent consultants included interim reporting to the Review Committee and the opportunity for States parties, observers and stakeholders to provide inputs and observations. The report made a number of recommendations and following analysis by the Review Committee the overall number of these was reduced.

- Recommendations that were deemed by the Review Committee to be quite far removed from the practices that the Authority had developed over the past 20 years and were currently unlikely to be accepted by consensus were not taken forward.
- Some other recommendations were considered premature at the current stage of the ISA's evolution but could be considered in the future.

The Review Committee was also guided by the principle of remaining within the limits set in UNCLOS and related instruments in drafting its recommendations.

From an environmental perspective, key recommendations adopted and put forward by the Review Committee included the following:

- Sponsoring States should be invited to review their national legislation to control activities by entities with whom they have entered into contracts;
- the Secretary-General should be “requested to complete and continually update the compilation of the relevant national laws, regulations and administrative measures of sponsoring States with respect to activities in the Area.”
- investment in improved data management and data-sharing;
- addressing deficiencies in the current processes of reporting (e.g. annual reports) to the Council and the provision of meaningful feedback to Contractors;
- consideration should be given to the adding of expertise in environmental policy, management and planning within the Secretariat;
- improvement in the sharing and accessing of environmental data collected by Contractors;

- greater engagement by the Secretary-General with the scientific community and deep-sea science projects and initiatives related to the Area;
- specification of agreed performance standards relating to the development of technology for DSM in the Area in the context of the work on the exploitation regulations under the mining code;
- establishment of an LTC working group to deal with environmental issues;
- more frequent and open LTC meetings and broadening of the technical expertise within the LTC;
- development of an ISA strategic plan; and
- making non-confidential information, such as that relating to the protection and preservation of the marine environment, widely and readily accessible.

The review was wide-ranging and relatively high level. It is not clear to what extent such a future review by the Assembly would examine in detail the effectiveness of the ISA's environmental compliance assurance practices.

9.3.3 Recommendations

9.3.3.1 On-going Assessment by the ISA

It is recommended that the ISA adopts a 'live touch dashboard' approach in at least the first five years of applying its environmental compliance assurance processes and also for the first five years of applying these practices to any new Contractor. This approach would involve reviewing assurance performance against key targets and indicators set at the beginning of a year as part of strategic planning. Heads of compliance functions (monitoring, enforcement etc) should conduct review meetings on a monthly basis and escalate matters as required to the head of the environment department. Thereafter the compliance actions and allocations of funding and staff resources for that year would be amended to meet changed priorities if required.

9.3.3.2 Formal ISA Annual Assessment

The ISA environment department should undertake a formal annual assessment of its performance against the strategic plan for that year (as amended where appropriate by on-going reviews). The assessment should be reported to the Council and made publicly available. The assessment and internal and external feedback on it should be considered in the strategic planning process for the following year and the next rolling five-year period.

9.3.3.3 Formal Contractor and Contracting State Annual Assessments

The ISA should require each Contractor to undertake formal annual assessments of their performance against their environmental compliance assurance plans for that year. The assessments should be reported to the ISA and made publicly available.

9.4 EXTERNAL ASSESSMENT PRACTICES

9.4.1 Learnings from the Case Studies

Generally, the regulator organisations reviewed are not subject to formal external assessment of how effective their compliance assurance practices are, the exceptions being the New Zealand EPA and the PNA.

- The EPA's annual report is audited by Audit New Zealand¹¹⁹, a government agency, to see the extent to which performance, in terms of environmental compliance assurance delivery, was in accordance with both the Statement of Intent and the funding of the EPA. The annual report

and the statement from Audit New Zealand are also publicly examined by the Local Government and Environment Select Committee of Parliament. The EPA Board Chair, Chief Executive and senior staff appear before the Select Committee¹²⁰. The media is also usually present. It is also worth noting that some of the assessment of performance versus expectations contained in the EPA's Statement of Performance Expectations is based on surveys of the general public, stakeholders and customers and can therefore be considered as at least partly independent.

- The effectiveness of the PNA's environmental compliance assurance actions and the positive environmental outcomes are independently assessed through verification and accreditation of the target fishery by the Marine Stewardship Council (MSC)¹²¹.

The external assessment of the effectiveness of the environmental compliance assurance practices of private sector companies takes place at two levels.

- Their annual sustainability reports (or similar) are independently verified by an external party. Although the focus is on a limited number of key metrics the verification process involves visits to a sample of operating businesses.
- Where a company's operating businesses have environmental management systems certified to ISO 14001, external verification takes place on an annual basis.

It was, however, noted by Round Table Discussion participants that certification to ISO 14001 is not necessarily seen as the best answer in the private sector for a number of reasons:

- an equivalent standard of management system can be used (e.g. one that is aligned with the requirements of ISO 14001);
- ISO 14001 can have a negative impact on the quality of environmental compliance performance, through drawing 3-4 staff away from their on-going environmental duties for the weeks they spend preparing for the external audit;
- it does not drive organisational or behavioural change;
- because the 'system' is working does not mean best standards are being met in practice; and
- it omits public participation and stakeholder input.

9.4.2 Context for DSM and the ISA

Regarding environmental compliance assurance, the ISA is effectively acting on behalf of all humankind. As such it is a reasonable expectation that the effectiveness of its performance as an environmental regulator is externally assessed and made transparent to the public.

9.4.3 Recommendations

9.4.3.1 Avoid Making Certification to ISO 14001 a Requirement

While the ISA should require Contractors to develop and implement Environmental Management Systems that are aligned with ISO 14001, it should not require them to have formal certification to the standard.

9.4.3.2 External Review by Verification Organisation or Ombudsman

The ISA should have its annual compliance review report externally verified by either an internationally recognised verification organisation or an 'ISA ombudsman' to see the extent to which performance, in terms of environmental compliance assurance delivery, was in accordance with an annual performance plan.

9.4.3.3 Public Participation

The assessment of performance versus expectations contained in the ISA's annual compliance review report should include consideration of feedback from surveys of the general public, stakeholders, Contractors and Sponsoring States.

Endnotes

¹ United Nations Convention on the Law of the Sea, (1982),

https://www.un.org/depts/los/convention_agreements/texts/unclos/closindx.htm.

² European Commission, "Environmental Compliance Assurance EU Action Plan" (2018),

https://ec.europa.eu/environment/legal/pdf/env-17-017-env-complianceassurance-factsheet_en.pdf.

³ In the context of this report an 'organisation' can be regarded as a party responsible for environmental compliance assurance: i.e. both regulators and regulated parties.

⁴ Organisation for Economic Co-operation and Development, *Ensuring Environmental Compliance: Trends and Good Practices* (OECD Publishing, 2009).

⁵ The roundtable discussions were also supported by current and former personnel of The Pew Charitable Trusts seabed mining project (Megan Jungwiwattanaporn, Hannah Lily and Conn Nugent) and of JM Kaplan Fund (Matthew and Amy Davidson).

⁶ Organisation for Economic Co-operation and Development, "Vintage Differentiated Regulations and Plant Survival: Evidence From Coal-Fired Power Plants - Environment Working Paper No. 144, ENV/WKP(2019)3" (2019),

[http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=ENV/WKP\(2019\)3&docLanguage=En](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=ENV/WKP(2019)3&docLanguage=En).

⁷ See e.g., International Seabed Authority, ISBA/16/a/12/Rev.1, Decision of the Assembly of the International Seabed Authority Relating to the Regulations on Prospecting and Exploration for Polymetallic Sulphides in the Area (Nov. 15, 2010), <https://www.isa.org.jm/documents/isba16a12-rev-1>.

⁸ International Seabed Authority, ISBA/19/LTC/8, Recommendations for the Guidance of Contractors for the Assessment of the Possible Environmental Impacts Arising from Exploration for Marine Minerals in the Area (March 1, 2013), <https://www.isa.org.jm/mining-code/recommendations-guidance-contractors-assessment-possible-environmental-impacts-arising-0>.

⁹ International Seabed Authority, Draft Regulations on Exploitation of Mineral Resources in the Area (March 25, 2019), <https://www.isa.org.jm/document/isba25cwp1-0>.

¹⁰ International Seabed Authority, ISBA/25/C/19/Add.1, Report of the Chair of the Legal and Technical Commission on the Work of the Commission at the Second Part of Its Twenty-Fifth Session (July 11, 2019), <https://www.isa.org.jm/documents/isba19lct8>; International Seabed Authority, ISBA/24/C/4, Information Relating to Compliance by Contractors with Plans of Work for Exploration, Report of the Secretary-General (Jan. 16, 2018).

¹¹ Rio Tinto, "Rio Tinto and Biodiversity: Achieving Results on the Ground," accessed March 28, 2020, <https://bobbloomfield.files.wordpress.com/2013/03/2008riotintobiodiversitystrategy.pdf>.

¹² Scottish Government Community Councils, "Unconventional Oil and Gas Consultation," accessed March 28, 2020, <http://www.communitycouncils.scot/unconventional-oil-and-gas-consultation.html>.

¹³ European Bank for Reconstruction and Development, "EBRD Shareholders and Board of Governors," accessed March 28, 2020, <https://www.ebrd.com/shareholders-and-board-of-governors.html>.

¹⁴ Marine Management Organisation does not publish an organisation chart and therefore Figure 2 has been compiled from descriptions of teams and roles on the MMO website. As such it should not be taken as an accurate or comprehensive representation of actual structure

-
- ¹⁵ International Seabed Authority, “Comparative Study of the Existing National Legislation on Deep Seabed Mining ” (unedited advance text, 2019), <https://www.isa.org.im/document/comparative-study-existing-national-legislation-deep-seabed-mining-0>.
- ¹⁶ D. Johnson et al., “Periodic Review of the International Seabed Authority Pursuant to UNCLOS Article 154” (Seascope Consultants Ltd., 2016), https://ran-s3.s3.amazonaws.com/isa.org.im/s3fs-public/documents/EN/22Sess/Art154/Art154_InterimRep.pdf.
- ¹⁷ International Seabed Authority, “Assembly,” accessed March 28, 2020, <https://www.isa.org.im/authority/assembly>.
- ¹⁸ International Seabed Authority, “Structure and Mandate of the Council,” accessed March 28, 2020, <https://www.isa.org.im/authority/council-structure-mandate>.
- ¹⁹ International Seabed Authority, “The Legal and Technical Commission,” accessed March 28, 2020, <https://www.isa.org.im/authority/legal-and-technical-commission>.
- ²⁰ International Seabed Authority, “The Finance Committee,” accessed March 28, 2020, <https://www.isa.org.im/la-autoridad/finance-committee>.
- ²¹ International Seabed Authority, “The Secretariat,” accessed March 28, 2020, <https://www.isa.org.im/secretariat>.
- ²² International Seabed Authority, “Office of Environmental Management and Mineral Resources,” accessed March 28, 2020, <https://www.isa.org.im/authority/office-environmental-management-and-mineral-resources>.
- ²³ International Seabed Authority, “Office of Legal Affairs,” accessed March 28, 2020, <https://www.isa.org.im/la-autoridad/office-legal-affairs>.
- ²⁴ International Seabed Authority, “Exploration Areas,” accessed March 28, 2020, <https://www.isa.org.im/contractors/exploration-areas>.
- ²⁵ E. Egede, M. Pal, and E. Charles, “ISA Technical Report 1/2019 a Study on Issues Related to the Operationalization of the Enterprise in Particular on the Legal, Technical and Financial Implications for the International Seabed Authority and for States Parties to the United Nations Convention on the Law of the Sea ” (unedited advance text, International Seabed Authority, 2019), <https://www.isa.org.im/document/isa-technical-report-12019>.
- ²⁶ International Seabed Authority, ISBA/25/C/5, Implementing an Inspection Mechanism for Activities in the Area, (Dec. 28, 2018), <https://www.isa.org.im/document/isba25c5>.
- ²⁷ International Seabed Authority, Rules of Procedure of the Council of the International Seabed Authority, <https://www.isa.org.im/documents/rules-procedure-council>.
- ²⁸ Note: The Finance Committee and the Enterprise are not shown for ease of illustration only.
- ²⁹ Hong Kong Special Administrative Region Environmental Protection Department, “Organisation Chart,” accessed March 28, 2020, https://www.epd.gov.hk/epd/english/about_epd/organ_chart/dd1.html#.
- ³⁰ Hong Kong Special Administrative Region Environmental Protection Department, “Organisation Chart (2),” accessed March 28, 2020, https://www.epd.gov.hk/epd/english/about_epd/organ_chart/organ_chart.html.
- ³¹ Hong Kong Special Administrative Region Environmental Protection Department, “Job Description: Permanent Secretary for the Environment, Transport and Works (Environment) / Director of Environmental Protection,” accessed March 28, 2020, https://www.epd.gov.hk/epd/english/news_events/legco/files/ea_201004_encl435.pdf.
- ³² Hong Kong Special Administrative Region Executive Council, “Membership of Executive Council,” accessed March 28, 2020, <https://www.ceo.gov.hk/exco/eng/membership.html>.
- ³³ New Zealand Environmental Protection Authority, “Statement of Performance Expectations 2018/19” (2019), <https://www.epa.govt.nz/assets/RecordsAPI/806997e3b2/EPA-Statement-of-Performance-Expectations-2018-19.pdf>.
- ³⁴ European Bank for Reconstruction and Development, “EBRD Strategies and Policies,” accessed March 28, 2020, <https://www.ebrd.com/what-we-do/strategies-and-policies.html>.
- ³⁵ International Seabed Authority, ISBA/24/a/4, Strategic Plan of the International Seabed Authority for the Period 2019–2023 (July 25, 2018), <https://www.isa.org.im/document/isba24a4>.
- ³⁶ Nauru Agreement Concerning Cooperation in the Management of Fisheries of Common Stocks, (1982 (amended 2010)), <http://www.pnatuna.com/content/nauru-agreement>.
- ³⁷ International Seabed Authority, ISBA/19/C/17, Decision of the Council of the International Seabed Authority Relating to Amendments to the Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area and Related Matters (July 22, 2013), <https://www.isa.org.im/documents/isba19c17>.
- ³⁸ International Seabed Authority, ISBA/24/C/21, Decision of the Council of the International Seabed Authority Relating to the Budget of the Authority for the Financial Period 2019-2020 (July 23, 2018), <https://www.isa.org.im/document/isba24c21>.

-
- ³⁹ European Bank for Reconstruction and Development, “Careers at the EBRD,” accessed March 28, 2020, <https://www.ebrd.com/careers-at-the-ebrd.html>.
- ⁴⁰ International Seabed Authority, “The Legal and Technical Commission.”
- ⁴¹ Nauru Agreement Concerning Cooperation in the Management of Fisheries of Common Stocks.
- ⁴² Each of these regulations is available at: <https://www.isa.org.jm/mining-code>.
- ⁴³ Global Sea Mineral Resources NV, “Environmental Impact Statement: Small-Scale Testing of Nodule Collector Components on the Seafloor of the Clarion-Clipperton Fracture Zone and Its Environmental Impact” (2018; BGR, “Environmental Impact Assessment for the Testing of a Pre-Prototype Manganese Nodule Collector Vehicle in the Eastern German License Area (Clarion-Clipperton Zone) in the Framework of the European JPI-O Mining Impact 2 Research Project” (2018), <https://www.isa.org.jm/environmental-impact-assessments>.
- ⁴⁴ Parties to the Nauru Agreement (PNA), “About Us,” accessed March 31, 2020, <http://www.pnatuna.com/About-Us>.
- ⁴⁵ Hong Kong Special Administrative Region Environmental Protection Department, <https://www.epd.gov.hk/epd/english/cac/aboutus/aboutus.html>.
- ⁴⁶ New Zealand Environmental Protection Authority, “EEZ Compliance Engagement Strategy” (2018).
- ⁴⁷ International Association of Oil and Gas Producers, “International Association of Oil and Gas Producers,” accessed March 31, 2020, <https://www.iogp.org/>.
- ⁴⁸ IPIECA, “About Us,” accessed March 31, 2020, <http://www.ipieca.org/about-us/faq/>.
- ⁴⁹ International Council on Mining and Metals, “International Council on Mining and Metals,” accessed March 31, 2020, <https://www.icmm.com/>.
- ⁵⁰ Hong Kong Special Administrative Region Environmental Protection Department, List of Guidance Notes on Best Practicable Means (BPM) for Specified Processes, https://www.epd.gov.hk/epd/english/environmentinhk/air/guide_ref/guide_best_pract.html.
- ⁵¹ European Bank for Reconstruction and Development, Environmental and Social Policy Implementation, <https://www.ebrd.com/who-we-are/our-values/environmental-and-social-policy/implementation.html>.
- ⁵² European Environment Agency, EU Best Available Techniques Reference Documents (BREFS), <https://www.eea.europa.eu/themes/air/links/guidance-and-tools/eu-best-available-technology-reference>.
- ⁵³ Marine Management Organisation, “Evidence Strategy for the Marine Management Organisation (MMO)” (2019), <https://www.gov.uk/government/publications/evidence-strategy-for-the-marine-management-organisation-mmo>.
- ⁵⁴ Marine Management Organisation, “MMO Master Data Register (MDR),” accessed March 31, 2020, <https://www.gov.uk/government/publications/master-data-register>.
- ⁵⁵ British Marine Aggregate Producers Association, “Aggregates Levy” (2013), https://bmapa.org/issues/aggregates_levy.php.
- ⁵⁶ IPIECA-IOGP Biodiversity and Ecosystem Services Working Group (BESWG), Marine Geospatial Bibliography, 2017.
- ⁵⁷ International Seabed Authority, “Deep Data,” accessed March 31, 2020, <https://data.isa.org.jm/isa/map/>.
- ⁵⁸ International Seabed Authority, “ISA Catalogue,” accessed March 31, 2020, <https://www.isa.org.jm/library-web-services>.
- ⁵⁹ International Seabed Authority, “Bibliographic Database,” accessed March 30, 2020, <https://www.isa.org.jm/bibliographic-database>.
- ⁶⁰ Republic of South Africa Department of Environment Affairs, Protected and Conservation Areas Database.
- ⁶¹ Republic of South Africa Department of Environment Affairs, National Web Based Environmental Screening Tool.
- ⁶² European Bank for Reconstruction and Development, “Capacity Building Workshop on Environmental, Health and Safety and Social Policies,” accessed March 31, 2020, <https://monkeyforestconsulting.com/ebird-workshops/>.
- ⁶³ International Seabed Authority, “Workshops,” accessed March 31, 2020, <https://www.isa.org.jm/workshops>.
- ⁶⁴ Marine Management Organisation, “Changes to Processes for Sediment Sampling and Analysis,” news release, March 2018, <https://www.gov.uk/government/news/changes-to-processes-for-sediment-sampling-and-analysis>.
- ⁶⁵ European Bank for Reconstruction and Development, “EBRD Celebrates Clients’ Commitment to Sustainability,” news release, May 2019, <https://www.ebrd.com/news/2019/ebird-celebrates-clients-commitment-to-sustainability.html>.
- ⁶⁶ Environmental Assessment Practitioners Association of South Africa, “The Environmental Assessment Practitioners Association of South Africa (EAPASA),” accessed March 31, 2020, <https://eapasa.org/>.

-
- ⁶⁷ Marine Management Organisation, “Compliance and Enforcement Strategy” (2019), <https://www.gov.uk/government/publications/compliance-and-enforcement-strategy/compliance-and-enforcement-strategy>.
- ⁶⁸ Ibid.
- ⁶⁹ Hong Kong Special Administrative Region Environmental Protection Department, “Guangdong-Hong Kong-Macao Pearl River Delta Regional Air Quality Monitoring Network Results for 2018,” news release, June 2019, <https://www.info.gov.hk/gia/general/201906/27/P2019062700369.htm>.
- ⁷⁰ European Bank for Reconstruction and Development, “EBRD Strategies and Policies.”
- ⁷¹ The Interoceanmetal Joint Organization, “The Interoceanmetal Joint Organization,” accessed March 31, 2020, <https://iom.gov.pl/iom-story/>.
- ⁷² International Seabed Authority, “Impact Reference Zone,” accessed March 30, 2020, <https://www.isa.org.jm/impact-reference-zone>.
- ⁷³ International Seabed Authority, “Preservation Reference Zone,” accessed March 31, 2020, <https://www.isa.org.jm/preservation-reference-zone>.
- ⁷⁴ United Kingdom, Oil and Gas: EEMS Database, <https://www.gov.uk/guidance/oil-and-gas-eems-database>.
- ⁷⁵ Parties to the Nauru Agreement, “Longline Vessel Day Scheme” (2016), <https://www.pnatuna.com/content/longline-vessel-day-scheme>.
- ⁷⁶ European Commission, “Vessel Monitoring System (VMS),” accessed March 31, 2020, https://ec.europa.eu/fisheries/cfp/control/technologies/vms_en.
- ⁷⁷ The Crown Estate, “About Us: Minerals and Dredging,” accessed March 31, 2020, <https://www.thecrownestate.co.uk/en-gb/what-we-do/on-the-seabed/minerals-dredging/>.
- ⁷⁸ J.A. Ardron, “Transparency in the Operations of the International Seabed Authority: An initial assessment,” *Marine Policy* 95 (2018): 324-331, <https://doi.org/10.1016/j.marpol.2016.06.027>.
- ⁷⁹ International Seabed Authority, Draft Regulations on Exploitation of Mineral Resources in the Area (March 25, 2019), <https://www.isa.org.jm/document/isba25cwp1-0>.
- ⁸⁰ Parties to the Nauru Agreement, “Observer Program,” accessed March 31, 2020, <https://www.pnatuna.com/observer-program>.
- ⁸¹ Marshall Islands Marine Resources Authority, “Observer Program,” accessed March 31, 2020, <http://www.rmimimra.com/>.
- ⁸² International Seabed Authority, ISBA/25/C/5, Implementing an Inspection Mechanism for Activities in the Area (Dec. 28, 2018), <https://www.isa.org.jm/document/isba25c5>.
- ⁸³ BP Indonesia, Reports, https://www.bp.com/en_id/indonesia/home/news/reports.html.
- ⁸⁴ Rio Tinto, “Details on Tailings Facilities,” accessed March 31, 2020, https://www.riotinto.com/documents/190612_Rio_Tinto_releases_further_details_on_tailings_facilities.pdf.
- ⁸⁵ Compliance Advisor Ombudsman, “Office of the Compliance Advisor/Ombudsman (CAO) Terms of Reference” (http://www.cao-ombudsman.org/about/whoweare/documents/TOR_CAO.pdf).
- ⁸⁶ Ibid.
- ⁸⁷ New Zealand Environmental Protection Authority, “EEZ Compliance Engagement Strategy.”
- ⁸⁸ Marine Management Organisation, “Risk-Based Enforcement Process: Risk Monitoring of Non-Compliant Behaviours,” https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/317546/risk-based-enforcement.pdf.
- ⁸⁹ International Seabed Authority, International Seabed Authority Secretariat Updates Member States on Progress of the Data Management Strategy (July 2018), <https://www.gov.uk/guidance/oil-and-gas-eems-database>.
- ⁹⁰ Ibid.
- ⁹¹ International Seabed Authority, “ISA Deep Data,” (2019).
- ⁹² New Zealand Environmental Protection Authority, “EEZ Compliance Monitoring Policy,” <https://www.epa.govt.nz/industry-areas/eez-marine-activities/about-the-exclusive-economic-zone-and-continental-shelf/compliance-monitoring/>.
- ⁹³ European Bank for Reconstruction and Development, “EBRD Strategies and Policies.”
- ⁹⁴ Hong Kong Special Administrative Region Environmental Protection Department Policy.
- ⁹⁵ New Zealand Environmental Protection Authority Prosecution Policy (2014), <https://www.epa.govt.nz/assets/Uploads/Documents/EPA-Publications/EPA-Prosecution-Policy.pdf>.
- ⁹⁶ Marine and Coastal Access Act 2009, <http://www.legislation.gov.uk/ukpga/2009/23/notes/division/2>.

-
- ⁹⁷ Hong Kong Special Administrative Region Environmental Protection Department, The Statement of Prosecution Policy for the Environmental Protection Department, https://www.epd.gov.hk/epd/english/news_events/current_issue/current_policy.html.
- ⁹⁸ Republic of South Africa Department of Environment Affairs, "Environmental Management Inspectorate (EMI)," accessed March 31, 2020, <https://www.environment.gov.za/projectsprogrammes/emi>.
- ⁹⁹ New Zealand Environmental Protection Authority, "Enforcement and Compliance," <https://www.epa.govt.nz/about-us/what-we-do/enforcement-and-compliance/>.
- ¹⁰⁰ New Zealand Environmental Protection Authority, "Prosecution Policy" (2014), <https://www.epa.govt.nz/assets/Uploads/Documents/EPA-Publications/EPA-Prosecution-Policy.pdf>.
- ¹⁰¹ Marine Management Organisation United Kingdom Compliance and Enforcement Strategy (2019), <https://www.gov.uk/government/publications/compliance-and-enforcement-strategy/compliance-and-enforcement-strategy>.
- ¹⁰² Hong Kong Special Administrative Region Environmental Protection Department Environmental Compliance, Enforcement in Action, https://www.epd.gov.hk/epd/english/laws_regulations/enforcement/e_chapter3.html.
- ¹⁰³ International Seabed Authority, "Comparative Study of the Existing National Legislation on Deep Seabed Mining" (unedited advance text).
- ¹⁰⁴ European Bank for Reconstruction and Development, Environmental and Social Impact Assessments, <https://www.ebrd.com/esia.html>.
- ¹⁰⁵ New Zealand Environmental Protection Authority, EEZ Applications, <https://epa.govt.nz/database-search/eez-applications>.
- ¹⁰⁶ Hong Kong Environmental Protection Department, "Environmental Monitoring and Audit Reports" (<https://www.epd.gov.hk/eia/register/english/permit/vep5052016/documents/emar201905/html/emar201905.htm>).
- ¹⁰⁷ International Seabed Authority, ISBA/25/a/2, Report of the Secretary-General of the International Seabed Authority under Article 166, Paragraph 4, of the United Nations Convention on the Law of the Sea (May 3, 2019), <https://www.isa.org.jm/document/isba25a2>.
- ¹⁰⁸ International Seabed Authority, ISBA/25/C/19, Report of the Chair of the Legal and Technical Commission on the Work of the Commission at the First Part of Its Twenty-Fifth Session (March 25, 2019), <https://www.isa.org.jm/document/isba25c19>.
- ¹⁰⁹ New Zealand Environmental Protection Authority, "Statement of Performance Expectations 2018/19."
- ¹¹⁰ Republic of South Africa Department of Environment Affairs, "Strategic Plan and Annual Performance Plan," https://www.environment.gov.za/sites/default/files/strategic_plans/EnvironmentalAffairs_StrategicPlan2019-2024-AND-App2019-2020.pdf.
- ¹¹¹ Republic of South Africa Department of Environmental Affairs, "Legal Authorisations and Compliance Inspectorate," accessed March 28, 2020, https://www.environment.gov.za/branches/legalauthorisation_complianceinspectorate.
- ¹¹² Global Reporting Initiative, "GRI Standards," accessed March 31, 2020, <https://www.globalreporting.org/standards>.
- ¹¹³ Marine Management Organisation, "Annual Report and Accounts" (2019), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/819727/CCS001_CCS0319930646-001_MMO_Annual_Report_and_Accounts_Web_Accessible.pdf.
- ¹¹⁴ European Bank for Reconstruction and Development, "Project Complaint Mechanism," accessed March 31, 2020, <https://www.ebrd.com/work-with-us/project-finance/project-complaint-mechanism/about.html>. *ibid.*
- ¹¹⁵ International Finance Corporation, "Good Practice Note: Addressing Grievances from Project-Affected Communities" (2009), <https://www.ifc.org/wps/wcm/connect/f9019c05-0651-4ff5-9496-c46b66dbee6b/IFC%2BGrievance%2BMechanisms.pdf?MOD=AJPERES&CACHEID=ROOTWORKSPACE-f9019c05-0651-4ff5-9496-c46b66dbee6b-jkD0-g>.
- ¹¹⁶ E. Mazur, "Outcome Performance Measures of Environmental Compliance Assurance: Current Practices, Constraints and Ways Forward" (Organisation for Economic Co-Operation and Development Environment Working Papers, No. 18, OECD Publishing, Paris, 2010), <https://www.oecd-ilibrary.org/content/paper/5kmd9j75cf44-en>.
- ¹¹⁷ Marine Management Organisation, "Annual Report and Accounts."
- ¹¹⁸ International Seabed Authority, ISBA/23/a/3 Letter from the Chair of the Committee Established by the Assembly to Carry out a Periodic Review of the International Regime of the Area Pursuant to Article 154 of the United Nations Convention on the Law of the Sea to the Secretary General of the ISA (Feb. 8, 2017), <https://www.isa.org.jm/document/isba23a3>.

¹¹⁹ New Zealand Environmental Protection Authority, “Annual Report” (2018).

¹²⁰ New Zealand Parliament, “Annual Review of the Environmental Protection Authority” (2018/2019), https://www.parliament.nz/en/pb/sc/business-before-committees/document/FINS_93203/201819-annual-review-of-the-environmental-protection-authority.

¹²¹ Marine Stewardship Council, “Seafood for Future Generations, MSC Annual Report 2017-2018,” (2018).