Framework for resource management regulations in national and international deep seabed areas.

Harald Brekke, NPD/LTC
Some aspects of the Convention on the Law of the Sea

• Provisions on limits and national jurisdiction regarding marine resources (e.g. the continental shelf)
• Bilateral boundary delimitations
• Management of international seabed resources
• Rights of navigation
• Rights of marine, scientific research
The Convention on Law of the Sea

• The Continental Shelf
  • The sea-bed and subsoil of the submarine areas under the jurisdiction of the coastal States, as provided for in Part IV of the Convention.

• The Area
  • The sea-bed and subsoil of the submarine areas beyond the limits of national jurisdiction, as provided for in Part XI of the Convention.
The Continental Shelf extends either:

to 200 nautical miles

or:

to the outer edge of the Continental Margin (where this extends beyond 200 n.m.)
Determination of the outer edge of the continental margin

- Baseline
- Shelf
- Slope
- Rise
- Deep ocean floor

- Crystalline continental crust
- Oceanic crust
- Sediments

Foot of slope: 60M
1% of distance to foot of slope

Nautical mile (M)
Continental shelf limits of Norway
Continental shelf limits of Norway

Areas beyond 200 nautical miles indicated
Obligation

• Where the continental shelf extends beyond 200 nautical miles, the coastal state must acquire relevant data and information to define those limits in accordance with article 76.

• To be submitted for consideration by the Commission on the Limits of the Continental Shelf (CLCS) within 10 years of ratification
Areas of submissions
Seabed Jurisdiction

- The Area: 53%
- 200 n.m. zones (EEZ): 39%
- OCS submissions: 7%
- OCS in PID: 1%

Image: Seabed Jurisdiction - Estimated totals
- Area under national jurisdiction (up to 200 M from the baseline)
- Seabed area beyond 200 M:
  - The Area (final boundary to be determined following the delineation of the outer continental shelf)
  - Area of outer continental shelf submitted by States
  - Area for which recommendations have been made and a summary has been published
  - Estimated area of outer continental shelf indicated in preliminary information submitted by States

Sources: IOC/LOS/CLCS: Global Maritime Boundaries Database, 2010

http://www.grida.no/publications/shelf-last-zone/
Seabed resources
Types of seabed resources

• Oil and gas

• Seabed minerals:
  • PM Nodules – Fe, Mn, Ni, Co, Cu
  • PM Sulfides – Cu, Pb, Zn, Au, Ag
  • PM Crusts – Mn, Co, Ni, Ti, Pt, Te, Ce, Sc, RRE
Oil and gas resources
Seabed minerals - typical habitats

• PM Nodules
  • In soft seabed at great ocean depths (4000 – 6000 meters) in distal parts of the oceans where there is minimal or no terrigenous sediment input

• PM Sulphides
  • Formed by hydrothermal vents along the central graben of ocean spreading ridges, typically 2000 – 3000 meters depth

• PM Crusts
  • On surfaces of bare rock on seamounts and other seafloor highs, typically 1500 – 2500 meters depth.
PM Nodules

Metallic compounds in sea water are deposited on nodules
Both diagenetic and hydrogenous nodule growth
Sea water enriched in metal compounds

Hydrogenous nodules
Diagenetic nodules

BASALT
SEDIMENT

3500
6500

PM Nodules

Nodules

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Formation of black smokers

- Black smoker
- Mineral deposits
- Ocean floor
- Superheated water
- Heat from magma below

PM Sulphides
PM Crusts

Formation of Fe-Mn crusts

Fe-Mn crust
Seamount

Hydrogenetic
Strong current flows
Data acquisition in exploration of metals

• Multi-beam echo sounding (hull-mounted and/or ROV/AUV);
• Measurement of the conductivity, temperature and depth (CTD),
• Side-scan sonar profiling (towed, ROV/AUV, other)
• Sub bottom profiling;
• Electromagnetic profiling (towed)
• Photography and video recording done by TV grab, sledge, ROV, AUV, submersibles or other;
• Rock sampling (ROV)
Data acquisition for environmental management

• Basis for establishment of environmental baseline
• Basis for environment impact studies/environment management plans
• Sampling of benthic and pelagic fauna
• Oceanographic parameters
• Sampling of seabed sediment data
Article 82

• 1. The coastal State shall make payments or contributions in kind in respect of the exploitation of the non-living resources of the continental shelf beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured.

• 4. The payments or contributions shall be made through the Authority, which shall distribute them to States Parties to this Convention, on the basis of equitable sharing criteria, taking into account the interests and needs of developing States, particularly the least developed and the land-locked among them.
Licences beyond 200 M

Norwegian Continental Shelf (NOCS)
Areas open for licensing
Licences awarded beyond or straddling 200 M limit line
Licenses awarded beyond or straddling 200 M limit line
Licences awarded beyond 200 M

- Licences beyond 200 M awarded under standard regulations and conditions

- Licences accepted based on the following proviso:
  - These blocks are located outside of the 200 nautical miles economic zone. If awarded the licence may be subjected to conditions reflecting art. 82 in UNCLOS (Law of the Sea), stipulating a royalty to be paid.

- Detailed regulations with regard to art. 82 have not yet been issued.
Continental shelf resources, Norway

• National regulations for oil and gas in place
• National regulations for seabed minerals not in place
• Fiscal system for exploitation beyond 200 M not in place
PM Sulfide deposits, global

Global Distribution of Hydrothermal Vent Fields
Arctic Ocean – Including Russian submission of 2001
Arctic Ocean – revised Russian submission of 2015
Arctic Ocean – submission of Denmark/Greenland Desember 2014
Arctic Ocean – current status with computed median lines
Arctic Ocean – current status with computed median lines
Active and Extinct Vent fields at the Arctic Mid-Ocean Ridge

- Hydrothermal plume
- Sulfide deposit
- Extinct field
- Active field

Pedersen et al. 2010

Courtesy of R. B. Pedersen, Univ of Bergen
Possible sulphide deposits in the Area in the Arctic

Vent locations from University of Bergen
The Area

Global distribution of outer continental shelf

States that lodged a submission to the CLCS
States that lodged Preliminary Information but did not disclose the extent of the area
Exclusive Economic Zone
Area of outer continental shelf according to the Executive Summaries of the submissions
Area of outer continental shelf according to Preliminary Information

Subsea Innovation Day, Bergen
The Area and its resources

• Article 136
  • The Area and its resources are the common heritage of mankind

• Article 137
  • All rights in the resources of the Area are vested in mankind as a whole, on whose behalf the Authority shall act. ...
The International Seabed Authority (ISA)

- Managing international seabed resources
- Recommendations by the Legal and Technical Commission
Bodies of the Convention

Meeting of States Parties

The SPLOS

The International Sea-bed Authority

The International Tribunal of the Law of The Sea

The Commission on the Limits of the Continental Shelf

The Authority

The ITLOS

The CLCS
The Authority

The Assembly

States Parties

Finance Committee (Elected members)

The Secretariat

The Secretary-General Staff

The Council

EPC (Elected members)

LTC

The Enterprise

UNCLOS

EPC - The Economic Planning Commission
LTC - The Legal and Technical Commission
Plan of Work

Article 153-3.

- Activities in the Area shall be carried out in accordance with a formal written plan of work approved by the Council after review of the Legal and Technical Commission.
The Applicants

Article 153-2.

• The Enterprise
• States Parties in association with the Authority
• The following when sponsored by a States Party:
  • State enterprises
  • Natural or juridical persons of a State Party
• Any group of the above
Exploration

• “Exploration” means the searching for deposits of xxxxx in the Area with exclusive rights, the analysis of such deposits, the use and testing of recovery systems and equipment, processing facilities and transportation systems and the carrying out of studies of the environmental, technical, economic, commercial and other appropriate factors that must be taken into account in exploitation;

• By application

• Annex III, article 3
The Reserved Areas
Annex III, articles 8 & 9

• Applications must contain
  • Total area sufficient for two mining operations
  • Division into two parts of equal estimated commercial value
  • Authority to designate one as reserved area

• For polymetallic nodules – compulsory

• For sulphides and crusts – optional
  • If offering joint venture with Enterprise: apply for one contract area
  • If not: apply for two contract areas and offer one as reserved area
Activities in reserved areas
Annex III, article 9

• Areas reserved for the Enterprise, or
• developing States and its subjects
• The Enterprise has the privilege to decide whether it intends to carry out activities in each reserved area
• If notification of interest is submitted by others (see above), its plan of work shall be considered if the Enterprise does not intend to carry out activities in the area
Size of contract areas

• Polymetallic nodules
  • Total area not to exceed 150,000 km\(^2\). To be divided into two parts of equal estimated commercial value. One offered as reserved area.

• Polymetallic sulphides
  • 100 blocks of 10 by 10 km (100 km\(^2\)), arranged in clusters within a rectangle not exceeding 300,000 km\(^2\). Double if reserved area is offered.

• Polymetallic crusts
  • 150 blocks of 20 km\(^2\), squares or rectangles, arranged in clusters within an area not more than 550 by 550 km (302,500 km\(^2\)). Double if reserved area is offered.
Plan of Work for Exploration

• Description and schedule for exploration programme
• Description of program for oceanographic and environmental baseline studies
• Preliminary assessment of possible impact of the proposed exploration activities on environment
• Proposal for measures for the prevention, reduction and control of pollution and other hazards
• Anticipated annual expenditures in the immediate five-year period
Duration of contracts

• Plan of work for exploration is approved for 15 years
• May be extended for periods of 5 years upon application; one period at a time. Approval by the Council on the recommendation by the LTC
States sponsoring exploration

• Cook Isl.
• Kiribati
• Nauru
• Singapore
• Tonga

• Brazil
• China
• India
• Japan
• South-Korea

• Belgium
• France
• Germany
• Russia
• UK
Applications for international exploration contracts

Number of applications (per year and ore)

- Crusts
- Sulphides
- Nodules


Applications per year and ore type for the period 1997 to 2014.
Applications for international exploration contracts

Number of applications (per year and ore)
(With timing of regulations)

- Crusts
- Sulphides
- Nodules
International exploration areas

Global distribution of outer continental shelf

States that lodged a submission to the CLCS
States that lodged Preliminary Information but did not disclose the extent of the area
Exclusive Economic Zone
Area of outer continental shelf according to the Executive Summary of the submissions
Area of outer continental shelf according to Preliminary Information

Sources: DOALOS/CLCS

http://www.grida.no/publications/shelf-last-zone/
Codes for Exploration

• Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area (adopted 13 July 2000, updated 25 July 2013)

• Regulations on Prospecting and Exploration for Polymetallic Sulphides in the Area (adopted 7 May 2010)

• Regulations on Prospecting and Exploration for Cobalt-Rich Crusts (adopted 27 July 2012)
Annual reports from contractors

• Exploration work – Operational details of field surveys & sampling program
• Environmental monitoring and assessment
• Mining tests and proposed mining technologies
• Training program
• Certified financial statement of actual and direct exploration expenditure
• Program of activities for the following year
• Additional Information provided by the Contractor
Expiry of early exploration contracts

Number of applications (per year and ore)
(With timing of regulations and pioneers)

- Crusts
- Sulphides
- Nodules

Pioneer contracts expire

Pioneer Investors
PMN
Pioneer Contracts
PMS
CHC

Moving towards exploitation

- Council have requested the LTC to:
- Formulate Procedures and Criteria for Applications for Extension of Exploration Contracts
  - (First applications for extensions were submitted September 2015)
- Develop and formulate Regulations for the Exploitation of Marine Minerals in the Area
Development of a Draft Regulatory Framework for Exploitation activities – areas to be considered

• Legal framework
• Fiscal Regime (Payment mechanism)
• Applications for approval of plans of work (development and production)
• Contracts for exploitation
• Protection and preservation of the marine environment
• Resourcing and mining inspectorate within Secretariat
• Revenue management by the Authority
• Participation of the Enterprise
Development of a Draft Regulatory Framework for Exploitation activities – process

- Studies initiated by LTC and Secretariat (e.g. Technical Study No 11, 2013)
- Intermediate drafts and reports prepared by LTC and Secretariat based on consultancy, expert input, and stakeholders surveys
- Intermediate drafts and reports circulated to Members of the Authority and all stakeholders for comments
- An intermediate report and draft presented to Council in July 2015
- A zero draft will be circulated to stakeholders in spring 2016
- Updated zero draft to be presented to Council in July 2016
Studies and stakeholder surveys

Towards the Development of a Regulatory Framework for Polymetallic Nodule Exploitation in the Area

Technical Study: No. 11

Developing a Regulatory Framework for Mineral Exploitation in the Area

Report to Members of the Authority and all stakeholders

This Report contains a draft framework for the regulation of exploitation activities in the Area, as requested by the Council. The Report is addressed to all stakeholders and seeks comment on the draft framework, which draws on the 2014 Stakeholder Survey.
# Overview timeline for the delivery and development of a regulatory regime for the exploitation of mineral resources in the Area

<table>
<thead>
<tr>
<th>ID</th>
<th>Task / deliverable</th>
<th>Depends on / related to</th>
<th>Lead</th>
<th>Assist</th>
<th>Format</th>
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<tbody>
<tr>
<td>1.1</td>
<td>Draft core exploitation regulations and standard terms for contract for exploitation</td>
<td>-</td>
<td>Sec / LTC Experts</td>
<td>WG</td>
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<td>1.2</td>
<td>Present to LTC for review</td>
<td>-</td>
<td>Sec Experts</td>
<td>-</td>
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<tr>
<td>1.3</td>
<td>Initial stakeholder working group (June 2016)</td>
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<td>Sec S/holders</td>
<td>WG</td>
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<td>1.4</td>
<td>Review for initial stakeholder review</td>
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<td>Sec Experts</td>
<td>-</td>
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<tr>
<td>1.5</td>
<td>Present to LTC / Council &amp; stakeholders as first draft</td>
<td>-</td>
<td>Sec Experts</td>
<td>WG</td>
<td></td>
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<tr>
<td>1.6</td>
<td>Update as regulatory framework evolves (+ resource category specific)</td>
<td>-</td>
<td>Sec Experts</td>
<td>WG</td>
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<tr>
<td>1.7</td>
<td>Target completion date for &quot;final&quot; draft regulations &amp; standard contract terms &amp; guidelines and recommendations (where practicable): 26th Session + Stakeholder conference</td>
<td>-</td>
<td>LTC Sec</td>
<td>Conference</td>
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## Timeline

<table>
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<tr>
<th>Key:</th>
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<tbody>
<tr>
<td>Major work area</td>
</tr>
<tr>
<td>Activity (6-month blocks but each headline task requires separate TOR / plan)</td>
</tr>
<tr>
<td>Delivery / review milestone / target (LTC Meeting / Annual Session)</td>
</tr>
<tr>
<td>WP Working paper / technical paper</td>
</tr>
<tr>
<td>WG Working group(s)</td>
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### 2 Category A Priorities

#### 2.1 ISA Stakeholder Consultation and Participation

- Draft consultation and participation framework document: who, how and when?

#### 2.2 Data management strategy and implementation plan

- Finalise data management strategy
- Develop technical plan for implementation in conjunction with key stakeholders
- Implement technical plan, procedures and protocols

#### 2.3 Rights of the contractor

- Design and develop procedures for "preference and priority" mechanism
- Nature of exploitation rights to be made clear and unambiguous
- Legal title: Consideration of the phrase "recovery in accordance with the Convention"

#### 2.4 Duration of contracts / Substantive review

- Understanding of contractor production and economic models
- Draft working paper covering relevant duration criteria and options (resource specific)
- Substantive and periodic review periods(s); develop pre-determined evaluation criteria and guidelines
- Evaluation criteria for renewal of an exploitation contract
- Assess cut-off point for commercial inactivity

#### 2.5 Size of exploitation area(s)

- Guidelines on criteria to be applied in assessing the size and location of exploitation areas - discussion with Contractors / Follow up questionnaire

#### 2.6 Confidentiality

- Draft working paper on alternative wording for confidentiality requirements (include ETI recommendations)
- Circulate to stakeholders for comment and input
- Make recommendations to Council

#### 2.7 Effective protection for the marine environment from harmful effects

#### 2.7.1 Environmental impact assessment (+ISA)

- Develop / assess process and procedures for Environmental impact assessment

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Subsea Innovation Day, Bergen
Summary

• Subdivision of the seabed:
  • The continental shelf within 200 M
  • The continental shelf beyond 200 M
  • The international seabed area – “The Area”

• Activity continental shelf areas are subject to national regulations

• Regulations for exploration for minerals in international seabed areas (the Area), are established by the ISA

• Regulations for exploitation of minerals in international seabed areas are currently being developed by the ISA