

Prospecting and exploration for cobalt-rich ferro-manganese crusts and polymetallic sulphides in the Area - Framework established by the code



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Structure of the presentation

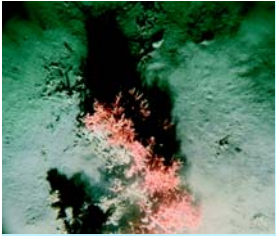
- The draft regulations
- Generic considerations
- Definitions
- Approach of the LTC adapting nodule code
- Rationale behind framework set up by the code/draft regs
- Regs at the 12th Session

The draft regulations - 1

- Definition of terms
- Prospecting - notification, outline description, SG
- Protection and preservation of the Marine environment- necessary measures, establishment and implementation programmes
- Annual Reporting

The draft regulations - 2 (Exploration)

- Plan of work, sponsorship certification
- Area: 100 blks, contiguous
- Financial and experience statement
- Reserved area/equity interest/joint venture
- Fees, processing by ISBA, LTC, Council
- Relinquishment
- Part V: Marine environment, emergency orders
- Confidentiality, general procedures
- Annexes of contracts, etc



Generic considerations

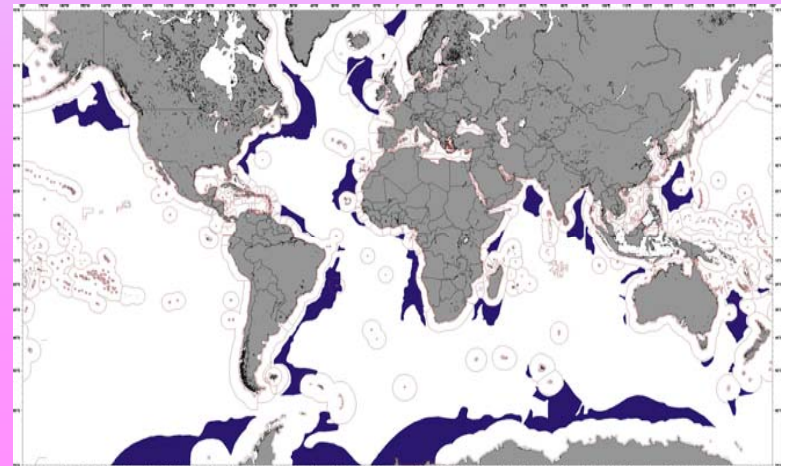
- Physical differences between Mn nodules and both Co-rich/FeMn crusts and PMS
- “Cherry-picking”
- Alternative to site banking provisions
- Environmental issues
- Encouraging to contractors

Definitions

- Prospecting
- Exploration
- Co-rich ferro-manganese crusts
- Polymetallic sulphides

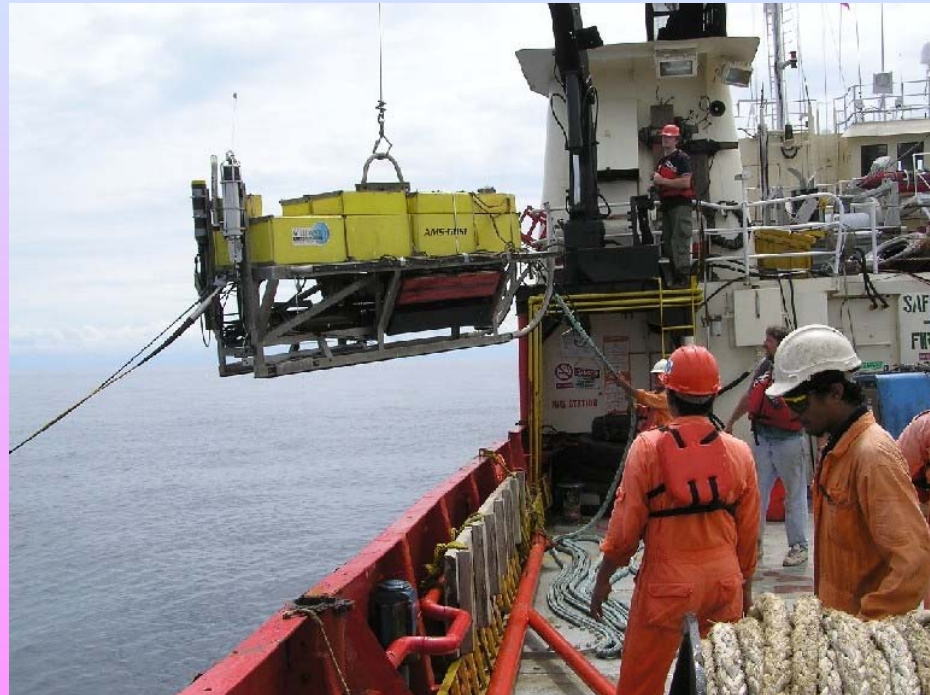
Prospecting

- Phase preliminary to exploration and exploitation
- Activities in the Area
- General survey large area, view to evaluation



Exploration

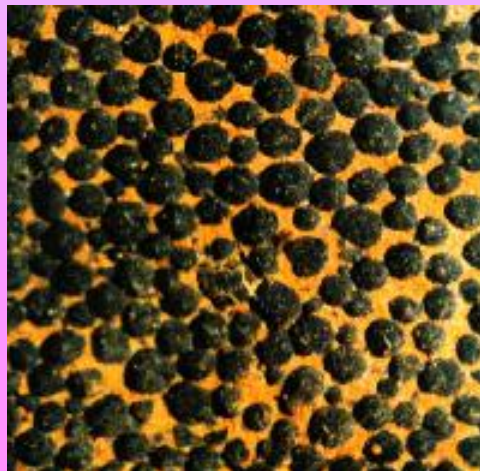
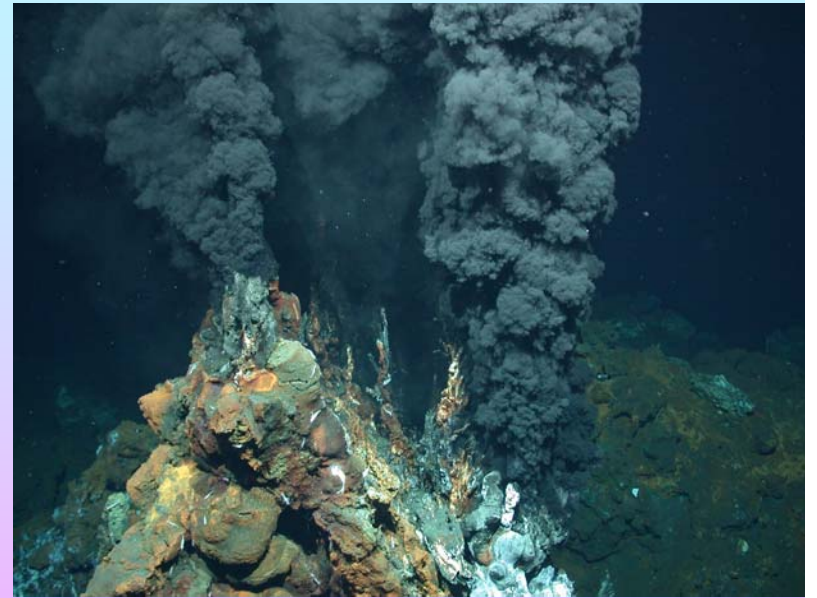
- Searching with exclusive rights
- Adoption of certain responsibilities



The resources



- Cobalt-rich FeMn crusts
- Polymetallic sulphides



Polymetallic manganese nodules

Co-rich FeMn crusts

- Complex nucleation of metallic minerals
- Seamount and guyots
- Depth limit to viability of deposit
- Distribution non-uniform
- Site specific biomass

Co-rich FeMn crusts

- Sediment cover
- Grade, age, thickness
- Mining technique
- Annual tonnage for viable mining operation
- Summit of seamounts, large surface area
- Clusters preferred

Co-rich FeMn crusts - Mine Site

- 3-7 av. sized seamounts for viable 20yr mining operation

Polymetallic sulphides (PMS)

- High-temperature hydrothermal vent products
- Massive metallic minerals
- MORs and other volcanic settings
- Volcanic/ tectonic controls
- Distribution constrained
- Active and inactive
- Site specific biomass
- Site modelled every 50-100km of ridge
- 300 sites recorded, 100 host PMS

PMS

- Different substrates
- Different levels of maturity
- Different levels of tectonic significance, segmentation/dismemberment
- Poorly known in three dimensions
- Slow vs fast sites (largest HT systems, some off-axis, wider spaced)
- 10s to 100s m across, stockwork few km wide, and 100s m deep
- Use ancient analogues

PMS -mine site

- Only two sites quantified: TAG, Middle Valley
- Bulk wet tonnages 2.7 m, 10-15 m, respectively
- 'Cyprus'-type ophiolite-hosted PMS - 1.6 mt av.

Environmental considerations

- Baseline
- State of knowledge
- Current political consensus
- Realistic/practical requirements

The draft regs at the 12th Session

- 31st July - 4th August workshop
- Number and size of exploration area, block size
- Geometry of exploration areas, contiguity clusters
- Relinquishment provisions
- Joint venture options
- Environmental considerations
- Speed of development of code



Summary

- Context of geological character of the deposits and the development of the draft regulations/code
- The significance of the environmental aspects of these deposits
- The revenue options to the Authority
- The absence of a worked-through mining model