

Pilot Mining Tests: Legal and Regulatory Issues

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Background

- Technology advancing – faster than the legal regime?
- Choice of technology is decisive for reducing impacts of DSM
- PMTs are a logical next step in technological development
- Current regulation of PMT is inadequate
- PMT is clear exercise of precautionary approach
- PMT is essential for adaptive management
- Environmental protection is most effective when it interfaces well with technical activities

Issue 1: Obligation to Conduct PMTs

- Fundamental issue – know origins of obligations and intended functions to ensure effective regulation
- Explicit Obligation:
 - Exploration: tests are foreseeable activities, but not specifically required
 - Application for Exploitation: prerequisite for exploitation?, “results of tests conducted” in feasibility study or EIA (need clarity in draft)
 - Exploitation: Standard clauses, “production tests” during development phase, “production tests”, “capacity tests” as “development obligations”
 - Extent of obligation defined in individual plan of work / contract

Issue 1: Obligation to Conduct PMTs

- Implicit Obligation:

- Exploration: Best Available Techniques (BAT), Best Environmental Practices (BEP) – as far as reasonably possible
- Exploitation application: “evidence of BAT”
- Definition BAT (Dr. Env. Regs.): “latest stage of development”, “state of the art processes... facilities...methods of operation...”
- Linked to BEP duty to continually update environmental protection standards in line with technological development (Dr. Env. Regs.)
- In practice: dynamic nature of BAT/BEP requires on-going testing

DISCUSSION:

Is there a legal obligation to conduct pilot mining tests?

How can pilot mining be used to determine Best Available Techniques (BAT)?

Issue 2: Definition of “Scale” in UNCLOS

- Scale determines what PMT entails in a given stage of DSM: activities, environmental duties, performance requirements
- Scale \approx scope of testing
- UNCLOS provisions for “small-, medium- and large-scale” technologies
 - Engineering transition between equipment/plants (components of production) and systems (capable of full production) – not size
- Scale here refers to technology – not area of affected seabed
 - Engineering-oriented, not ecosystem-oriented
- Scale describes the state and process of technological development
 - Necessary for defining BAT, “state of the art” for identifying appropriate sites

Scale and Technical Readiness Levels

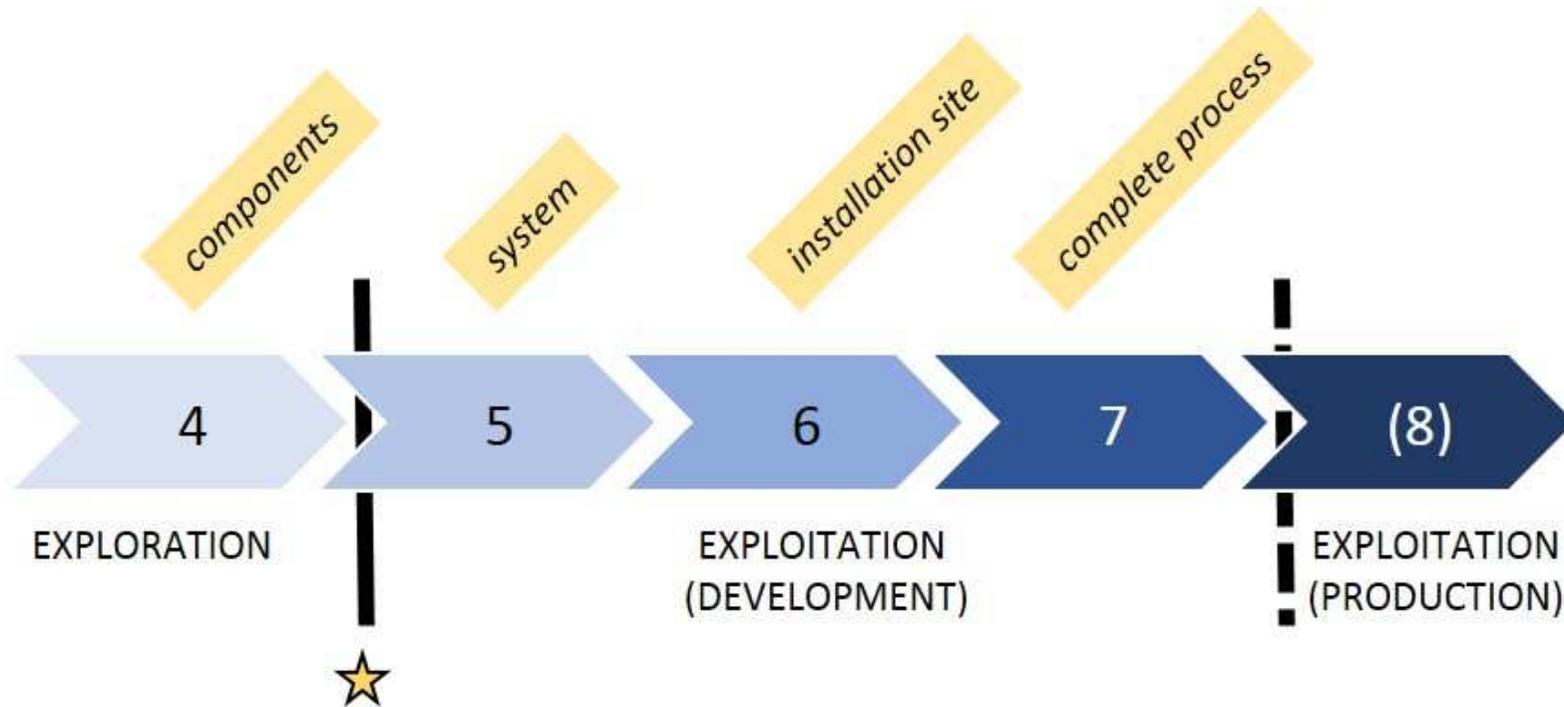
- Problem: Need objective criteria for scale to regulate PMTs. TRLs?
- Standardized TRLs used in different industries where tech development is central
 - Space, offshore oil and gas, sub-sea systems, FP7 Blue Mining
- Are TRLs suitable for DSM? Advantages:
 - emphasize continuity between phases, reduce fragmentation
 - span the entire tech development process, coherent regulation
 - supports standardization, creation of “objective criteria”
 - support the determination of BAT – relevant at all scales
 - help pinpoint opportunities for better environmental protection

Technical Readiness Levels

API 17N (Offshore Oil and Gas): Technical Readiness Levels

0	Unproven Concept (Basic R & D, paper concept)
1	Proven Concept (Proof of concept as a paper study or R & D experiments)
2	Validated Concept (Experimental proof of concept using physical model tests)
3	Prototype Tested (Component function, performance and reliability tested)
4	<u>Environment Tested</u> (Pre-production system environment tested)
5	<u>System Tested</u> (Production system interface environment tested)
6	<u>System Installed</u> (Production system installed and tested)
7	<u>Field Proven</u> (Production system field proven)

TRLs and UNCLOS Stages of DSM



DISCUSSION:

What is meant by “scale” in the DSM regime?

Is an international standard for Technical Readiness Levels (TRLs) useful for regulation?

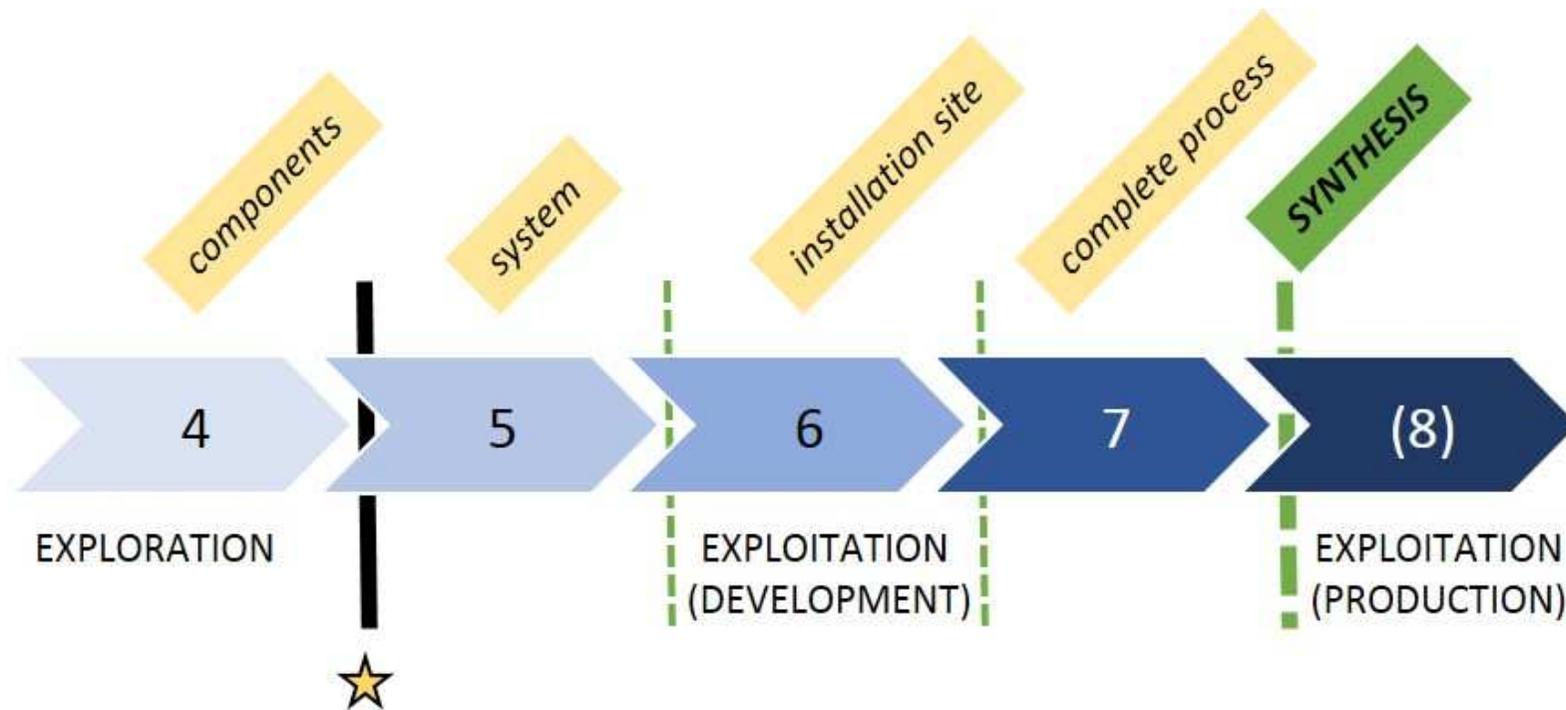
Issue 3: Challenges of EIA for PMTs

- Two functions of mining tests
 - Demonstrate technical and operational capability of contractor
 - Enable contractors and ISA to make environmental and economic projections about commercial production
- Testing context:
 - Least understanding of ecosystem dynamics, consequences of impacts
 - Least understanding of equipment and process
 - No prior opportunity to test mitigation/risk/emergency measures
- PMT ≠ a single test. Refers to an iterative process over a specific period of time.

Issue 3: Challenges of EIA for PMTs

- Specific problem for PMT: EIA under draft Exploitation Regs concerns impacts of commercial production, not impacts of development phase
 - PMT needs specific EIA procedures
- Purpose of EIA not just to prevent harm to the marine environment
 - Also iterative to support technical innovation, find correct development path
 - Provides essential inputs for SEA, site-specific EIAs, adaptive management
- But: EIA needs clear feedback loops for adaptive decision-making, and consistent, comparable assessment and monitoring methodologies
- TRL approach helps target EIA concerns at each step in PMT
 - TRL 5: technical alternatives, BAT, should tech be “up-scaled”?
 - TRL 6: sites for installations, reference zones, site-specific mitigation
 - TRL 7: entire process chain at commercial scale, prior to production, review of knowledge integration from previous stages, test risk management

TRLs and Potential EIA Stages for PMT



DISCUSSION:

Can TRLs be used to structure a multi-phase EIA obligation?

What specific EIA obligations should apply to PMT?

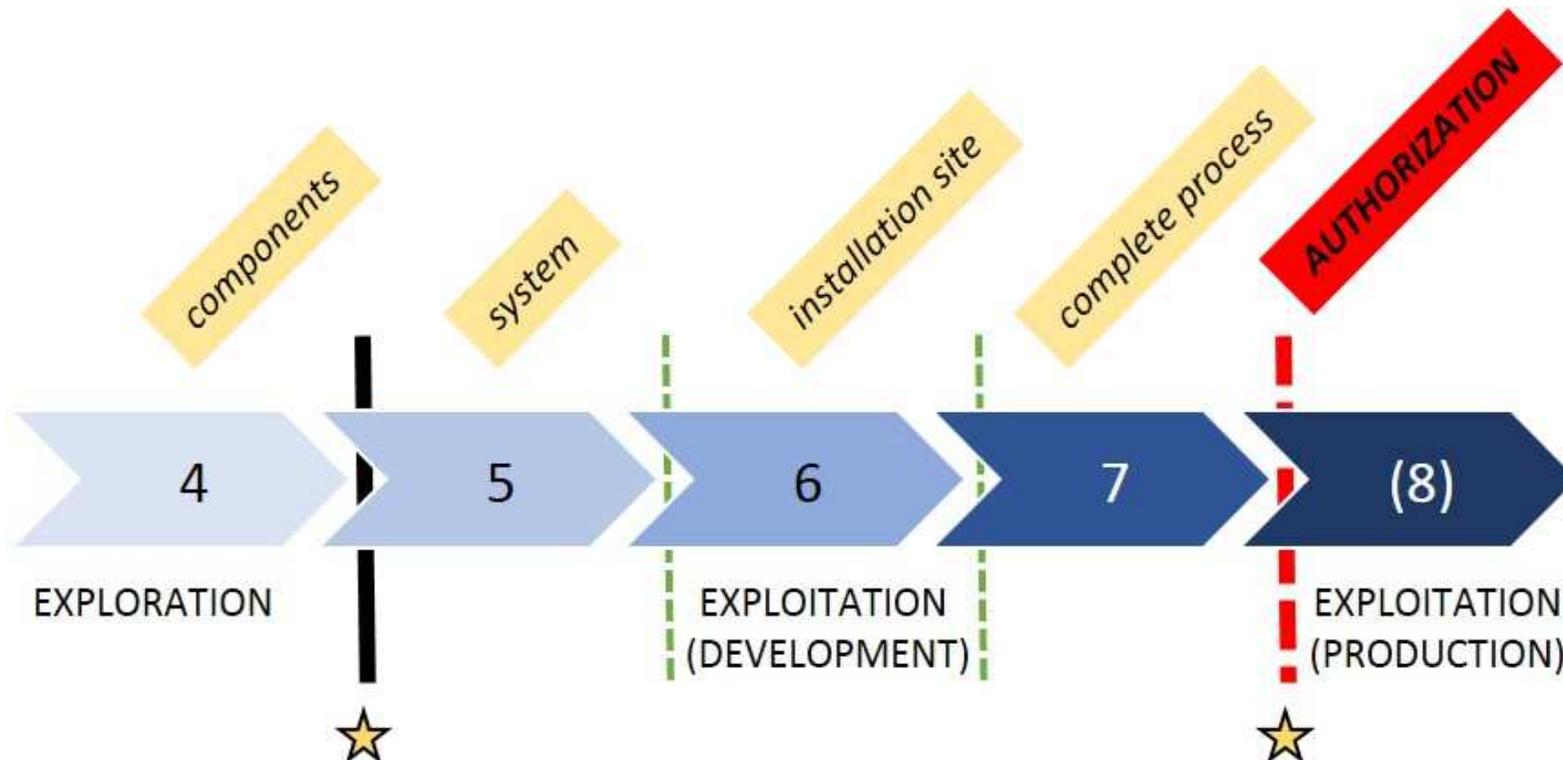
Issue 4: Use of PMT Information by ISA

- Currently no clear mechanism how PMT results are to be used by ISA
- Single-stage application for exploitation license in Draft Exploitation Regs
 - neglects two phases of exploitation: development and commercial production
 - approves production before development has even started
- Involves huge assumptions based on inadequate information:
 - Results from testing during exploration are wrong scale, but at right location
 - Testing at right scale cannot legally be conducted at right location prior to approval of exploitation application, results therefore obtained under different conditions
- Is this a well-founded decision-making process?
- Controlled, highly regulated PMT in development phase – at commercial scale – would greatly improve knowledge base for decision-making on future DSM

Issue 4: Use of PMT Information by ISA

- UNCLOS originally provided for “production authorization” after development (interim period) – different purpose, interesting procedure
- Could create a two-stage application process for exploitation
 1. Decision to allow commercial-scale PMT on basis of small-scale PMT during exploration
 2. Decision on production based on successful conclusion of PMT, after real observation of technology at correct site and scale and monitoring of impacts
- Advantages:
 - Would give ISA tool to disapprove of different mining practices – not just mining sites
 - Would compel good early EIAs, pursuit of least harmful technology
 - Could reverse the burden of proof in the second application stage – applicant must show PMT was not harmful in order to receive production authorization
 - Provides additional mechanism to support adaptive management
- Legal basis: Authority can take any measure in Part XI at any time to ensure compliance and exercise control (Art. 153 (4) and (5))

Synthesis: TRLs, EIA and Production Authorization



DISCUSSION:

*How can the ISA make better use of PMT information in decision-making?
Should exploitation require a two-stage application process?*

Thank you for your feedback!

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