

**DAY 1: WEDNESDAY, 3 MAY, 2023**

**0830 - 0930 REGISTRATION AND MORNING REFRESHMENTS**

**0930 - 0940 OPENING ADDRESS**

**0940 - 1005 GREEN DEEP SEA MINING – MOVING AHEAD WITH PRECAUTION**

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- Uncertainty and case for a moratorium on seabed mining and technology for sustainable seabed mining
- Regulations for protecting the environment and the bigger picture for decarbonisation and seabed mining

Govinder Chopra | Anantha Padmanabhan

**SeaTech Solutions**

**1005 - 1010 Q&A SESSION ON SUSTAINABILITY ASPECTS FOR DEEP SEA MINING – CHALLENGES & SOLUTIONS**

**1010 - 1035 DEEP SEA MINERALS – TARGETING TECHNICAL SOLUTIONS MINIMISING ENVIRONMENTAL IMPACTS**

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- Discussion on key drivers for engaging in the deep sea mining industry
- Technical concept – with a focus on keeping the environmental impact low
- Excavation only with less environmental impact than alternative excavation

Magne Nygård

**Aker BP**

**1035 - 1040 Q&A SESSION ON DSM WITH LESS ENVIRONMENTAL IMPACT STRATEGIES**

**1040 - 1100 MORNING COFFEE BREAK IN THE EXHIBIT AREA**

**1100 - 1130 PANEL DISCUSSION ON THE ADVANCEMENT OF TECHNOLOGIES FOR DEEP-SEA MINING**

**1130 - 1155 UPDATE ON SELECTIVE HARVESTING AUTONOMOUS UNDERWATER VEHICLE TECHNOLOGY**

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- Understanding the problems with current technologies for deep-sea mining present in the industry
- Looking at the updates on technologies like autonomous underwater robots and Bio-Extraction

Oliver Gunasekara

**Impossible Metals Inc**

**1155 - 1200 Q&A SESSION ON ADVANCEMENTS IN NODULE HARVESTING TECHNOLOGY IN DSM**

**1200 - 1330 NETWORKING LUNCH & VISIT THE DEEP SEA MINING SUMMIT EXHIBITION**

**1330 - 1355ADVANCED & ENERGY-EFFICIENT MINERAL UPLIFT/ MINERAL VERTICAL TRANSPORT SYSTEM**

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- Safety – introducing the hands-free automated riser make-up and break-out system for better results
- Energy efficiency – positive displacement pumps, having the most energy-efficient method of uplift
- De-risk investment – riser field proven. Pumps transporting ore slurries 500 to 600 km overland

George Adams

**Oil States Industries**

**1355 - 1400Q&A SESSION ON INNOVATIONS IN MINERAL TRANSPORT SYSTEMS FOR DSM OPERATIONS**

**1400 - 1425SHIP DESIGN AND CONVERSION FOR ENHANCED OPERABILITY IN SUBSEA MINING**

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- Subsea mining technical challenges, marine design drivers, and regulatory framework
- Naval architecture considerations, structural and marine, and electrical/ control systems
- Looking at safety considerations along with the technical solutions for mining operations

Keith W Hutchinson

**Safinah Group**

**1425 - 1430Q&A SESSION ON SHIP DESIGN AND ARCHITECTURAL CONSIDERATIONS FOR DSM**

**1430 - 1455UTILIZATION OF ROBOTICS AND AUTONOMOUS SYSTEMS (RAS) IN DEEP SEA MINING**

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- Introduction to RAS and benefits of using such systems in deep-sea mining operations
- Discussion on current applications in deep-sea mining and the latest advancements

Robert Garbett

**Drone Major Group**

**1455 - 1500Q&A SESSION ON THE BENEFITS OF AUTONOMOUS SYSTEMS IN DSM**

**1500 - 1530AFTERNOON COFFEE BREAK IN THE EXHIBIT AREA**

**1530 - 1555SEDIMENT PLUME MONITORING, MODELLING, AND CHARACTERISTICS**

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- Plume monitoring strategy, methodology, and results successfully applied during recent operations in the CCZ
- Allowing quantification of relevant sediment transport processes used for environmental impact assessments
- Operational monitoring and modelling of deep-sea mineral mining operations and delivering real-time assessment

Ole Larsen

**DHI Group**

**1555 - 1600 Q&A SESSION ON PLUME GENERATION, TRANSPORT, AND SETTLING IN DSM OPERATIONS**

**1600 - 1625 CONTROLS ON SEDIMENT DISPERSAL DURING DEEP SEA MINING**

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- Exploring methods to control the dispersal of sediment which is disturbed during the deep sea mining process
- Experiments for currents' spreading, and range of particle transport with the particles suspended on the seafloor

Andy Woods

**University of Cambridge**

**1625 - 1630 Q&A SESSION ON THE IMPACT OF SEDIMENTATION ON THE SEAFLOOR SYSTEM**

**1630 - 1655 CHALLENGES OF EXCAVATING ROCK IN DEEP SEA MINING OPERATIONS**

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- Looking at the potential systems for excavation, rock breakage, and transportation
- Advancements in the remote operations of the equipment in subsea mining projects

Jamal Rostami

**Colorado School of Mines**

**1655 - 1700 Q&A SESSION ON CHALLENGES AND SOLUTIONS FOR DSM OPERATIONAL ACTIVITIES**

**1700 - 1715 CLOSING REMARKS**

**1715 - 1800 NETWORKING DRINKS RECEPTION**

**DAY 2: THURSDAY, 4 MAY, 2023**

**0900 - 0930 MORNING REFRESHMENTS**

**0930 - 0940 OPENING ADDRESS**

**0940 - 1005 THE RIDDLE OF THE STANDARDS – WHEN WILL THE ISA EXPLOITATION RULES BE COMPLETE?**

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- Additional to the ISA regulations, up to 50 separate Standards and Guidelines shall be set up to supplement them
- Time pressure and lack of publicity in their drafting lead to questions such as
- What could be the effect on the rules (and the early application licenses!) if the "Phase 2" S&G is delayed
- What if ISA introduces the regulations for exploitation too late or is rejected by States called to sign the rules?

Andreas Käde

**Kanzlei Kaede**

**1005 - 1010 Q&A SESSION ON THE IMPACT OF STANDARDS AND GUIDELINES OF ISA ON THE MINING COMMUNITY**

**1010 - 1035 RECENT DEVELOPMENTS IN THE REGULATION OF DEEP SEABED MINING**

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- Looking at developments at the ISA, including progress on the exploitation regulations for mining
- Nauru's treaty provision known as the "two-year rule" and environmental issues arising from DSM

Katherine Reece Thomas

**City, University of London**

**1035 - 1040 Q&A SESSION ON ISA'S DEVELOPMENTS ON EXPLOITATION RULES FOR SEABED MINING**

**1040 - 1105 ESTABLISHING A LONG-TERM HYDROGRAPHIC MONITORING PROGRAM IN THE CCZ**

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- Setting up an ISA-compliant long-term monitoring program in the Clarion Clipperton Zone
- Presentation of initial long-term hydrographic/ current data from the deep-water region
- Discussion on the initial water quality parameters from a deep-water region of the CCZ

Christopher J. Kelly

**CSA Ocean Sciences Inc.**

**1105 - 1110 Q&A SESSION ON MONITORING AND ANALYSIS OF DEEP WATER CCZ ENVIRONMENT**

**1110 - 1130 MORNING COFFEE BREAK IN THE EXHIBIT AREA**

**1130 - 1155 SEISMIC FOR EXPLORING SEABED MINERALS AT THE MID-ATLANTIC RIDGE**

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**SHEARWATER**

- Discussion on expertise and service in the field of deep-sea mining for minerals exploration
- Work done with the Atlab 3 dataset and future planning for acquisition and the processing

Phil Hayes

**Shearwater GeoServices**

**1155 - 1200 Q&A SESSION ON THE UTILISATION OF SEISMIC TECHNOLOGIES FOR NODULES EXPLORATION**

**1200 - 1225 AUV TO COVER SEAFLOOR: COVERAGE RATES AS A FUNCTION OF PAYLOAD QUALITY & ENDURANCE**

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- The AUV as a truck breaks the mapping rate into two components, the carrier system and payloads
- Options on payload carriers, surface ship, ROV and leads into AUV whilst highlighting the risks, costs, and results
- Understanding results and options on coverage for cameras, magnetometers, sensors, echo sounders, etc.

Craig Wallace

**Deep Sea Vision**

**1225 - 1230 Q&A SESSION ON TECHNOLOGY FOR MAKING MINERAL SURVEYS EASIER & EFFICIENT**

**1230 - 1255 ACOUSTIC SYSTEM FOR HIGH-ACCURACY POSITIONING SOLUTIONS**

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- Deepwater high-accuracy positioning solution, similar to GPS but at full ocean depths
- Multi-user subsea positioning system, truly unlimited number of users again similar to GPS
- Large subsea area positioning coverage with a low-frequency long-range acoustic system

Scott Mark

**Imenco Smart Solutions**

**1255 - 1300 Q&A SESSION ON THE TECHNOLOGICAL ADVANCEMENTS IN ACOUSTIC SYSTEMS FOR DSM**

**1300 - 1315 FEEDBACK & RAFFLE DRAW**

**1315 - 1430 NETWORKING LUNCH**