

International Seabed Authority

The eighth session of the International Seabed Authority was held at Kingston, Jamaica, from 5 to 16 August 2002. Among the most important substantive matters discussed by the Authority during the session were the first set of annual reports of the seven contractors for exploration for polymetallic nodules and future regulations for prospecting and exploration for polymetallic sulphides and cobalt-rich ferromanganese crusts.

The eighth session also included a one-day seminar, open to all members and observers, on the prospects for hydrothermal polymetallic sulphides and cobalt-rich ferromanganese crusts in the Area. The seminar consisted of presentations by marine geologists and biologists of the latest findings about these resources and their environment and was intended to provide participants with background information on the status and characteristics of deep sea polymetallic sulphides and cobalt-rich ferromanganese crusts as well as information on the marine environment where these minerals are located. The essential problem for the Authority is that many of the same hydrothermal vent sites that are being targeted by scientific researchers and bioprospectors are also of considerable interest to prospective seabed miners. There is therefore considerable overlap, as well as potential for conflict, between the Authority's responsibilities in respect of the marine environment and activities directed at bioprospecting. The papers presented at the seminar have been published by the Authority as a technical study.

Most of the substantive work during the eighth session was carried out by the Legal and Technical Commission. In pursuance of the supervisory functions of the Authority with respect to contracts for exploration, the Commission made an evaluation of the first set of annual reports submitted by the contractors in accordance with the Authority's regulations for prospecting and exploration for polymetallic nodules in the Area. The Commission made a number of specific recommendations for improvements in the format of the reports and additional data.

With respect to the development of regulations relating to polymetallic sulphides and cobalt-rich ferromanganese crusts, the Council of the Authority noted the need for a flexible approach to the formulation of regulations for prospecting and exploration, particularly in view of the lack of scientific knowledge relating to deep sea ecosystems. It was also clear that polymetallic sulphides and cobalt-rich crusts were different from polymetallic nodules as well as distinct from one another. Particular ecological considerations arose with respect to polymetallic sulphides located at active hydrothermal vents. For these reasons members of the Council were in favour of

different sets of regulations for the two resources and proposed taking a cautious approach to their elaboration. At the same time, it was noted that any regulations must be consistent with the overall scheme contained in the Convention, the Agreement and the existing regulations relating to polymetallic nodules. From the point of view of potential investors, the most difficult issues would be how to determine the size of the area for exploration so as to make exploration commercially viable while avoiding monopoly situations. The system for the Area also had to be competitive with regimes established for areas within national jurisdiction.

Given the uncertainties surrounding these new deep sea resources, any scheme might be subject to review after an initial period as suggested by the Legal and Technical Commission, which will particularly take up three issues in 2003:

- a) environmental impacts of exploration activities;
- b) the size of exploration areas and a system for relinquishing parts of them to the Authority;
- c) the form of applicants' work plans, detailing their intentions; and the type of arrangements between contractors and the Authority, whether a parallel system (this system calls for dividing areas of equal commercial value between contractors and the Authority, but it would be difficult to split up the much smaller patches around hydrothermal vents – a factor that would also affect the size of the areas allocated to prospectors), joint ventures between contractors and the Authority or some other formula.

Promotion of Marine Scientific Research Relating to Seabed Resources

In July 2002, the Authority held an international workshop on prospects for international collaboration in marine environmental research on polymetallic nodule areas. This workshop, consisting of scientists, contractors' representatives, and members of the Legal and Technical Commission identified four priority topics for future research to be carried out through international cooperation to enhance understanding of the deep sea environment. These topics are:

- a) biodiversity, species ranges and rates of gene flow in the nodule areas;

- b) burial sensitivity of deep-sea animals and their response to the type of disturbance caused when nodules are scraped from the sea floor, as well as the recovery of marine organisms in space and time;
- c) impacts on ocean column located above a mine site; and
- d) natural variability in deep-ocean ecosystems over space and time.

Research on these topics is to be pursued by scientists and contractors, with the assistance of the Authority.

Besides, the Authority fosters scientific marine research on deep sea ecosystems. In the wave of the scientific revolution recognizing the ocean basins as sources of types of mineral deposits, two new deep-sea minerals are considered: polymetallic sulphides containing copper, zinc, silver and gold in varying amounts and cobalt-rich ferromanganese crusts. These two mineral resources are found in seabed areas underlying both national and international waters of the world's oceans. While nodules are scattered loosely over the sea floor, crusts are fused to the underlying rock and sulphides occur around hydrothermal vents sprouting from volcanic areas of the seabed. Thus different techniques will be needed to explore and mine the deposits. In addition to their future commercial potential, cobalt-rich ferromanganese crusts also warrant research for a better understanding of the geochemical history of ocean circulation. The hydrothermal vents concentrate polymetallic sulphide deposits and disperse metals into the oceans that contribute to the accumulation of cobalt-rich ferromanganese crusts, but also provide chemical energy from the Earth's interior that is used by genetic resources for their growth. These genetic resources are at the base of the food chain of an ecosystem of life forms at the hydrothermal vents that is largely independent of the light energy that fuels the photosynthesis in plants at the base of the food chain on land. The genetic resources are proving important as the source of new compounds for industrial and medical applications, and also include primitive forms that may hold the key to the origin of life. More than 500 new species have been described from deep sea hydrothermal vents since their discovery in 1977.

A current challenge is to incorporate these new mineral resources into the Convention regime in a way that protects the valuable life forms that they host. It is not currently possible to predict how rapidly vent sites may recover from mining operations – hence the importance of international collaboration in environmental research. At the same time, the management or protection of all of the world's marine hydrothermal sites is an unrealistic goal. Discussions should focus instead on

the criteria for identifying sites for future protection that are of critical importance, or particularly sensitive to disturbance, because of their scientific or educational value or their significance for species survival.

Collection and Dissemination of Information on Seabed Resources

In relation to its task of managing the mineral resources of the deep seabed on behalf of humankind, the International Seabed Authority is involved in a vast effort of collecting, analyzing, rationalizing and disseminating results of marine scientific research and data relating to prospecting and exploration for mineral resources.

The Agreement relating to the implementation of the Part XI of Convention (section 1, para.5(j)) stipulates that, between the entry into force of the Convention and the approval of the first plan of work for exploitation, the Authority shall concentrate on the assessment of available data relating to prospecting and exploration for mineral resources in the Area. Accordingly, the Secretariat has carried out a study to produce a resource assessment of metals of economic interest (nickel, copper, manganese and cobalt) to be found in polymetallic nodules in seabed areas reserved for the conduct of activities by the Authority. This resource assessment of the reserved areas demonstrates the high potential of the reserved areas for future development.

However, additional data are needed to enable the Authority to be familiar with the interaction between geological processes and mineral resources of the seabed in the Clarion-Clipperton Fracture Zone and consequently to enhance the quality of future resource assessment of the reserved areas. To this end, in January 2003, fifteen experts were invited to participate in a meeting of scientists to assist the Authority to identify a suitable geological model of polymetallic nodule resources in the Clarion-Clipperton Fracture Zone based on the data requirements contained in the Authority's regulations. This model is intended to facilitate resource assessments of deep seabed polymetallic nodules in the Clarion-Clipperton Fracture Zone. The meeting also recommended a programme of work and an agenda for the Authority's workshop to be held in May 2003. This workshop will provide a forum for independent experts, members of the Legal and Technical Commission, representatives of member States, representatives of interested marine geology institutions and representatives of contractors to exchange views and ideas on a geologic model.

In order to facilitate access to deep seabed data, the Authority in 2000 decided to establish a repository for marine minerals, referred to as the Central Data Repository (CDR). The CDR will

include public and private information on marine mineral resources. The next development phase of the CDR involves the development and testing of an integrated relational database that can be used as a management and research tool worldwide. During the next two years, the Authority will resume the collection of data on polymetallic nodules and integrate them into the database structure, develop and integrate an environmental database and develop and integrate graphical interfaces to provide visual data analysis tools over the Internet.