



**A Suggested Consideration to the Draft Regulation on
Prospecting and Exploration for Cobalt-rich
Ferromanganese Crusts**

(The size,Block and number for Exloration)

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INTRODUCTION

In June 9,2006, the website of ISA issued a document, (ISBA/12/C/3/Part 1), provided by the Secretariat. With respect to the size of areas, the block number for exploration, the document provides a model for the selection and quantification of parameters that can be used to define a seamount mine site for cobalt-rich crusts. Then, it suggested revisions to the draft regulations primarily

(1) The area covered by each application for approval of a plan of work for exploration for cobalt-rich crusts shall be comprised of not more than 125 blocks which shall be arranged by the applicant in 100 square kilometre clusters as set out in paragraph 2.

(2) Each 100 square kilometre cluster shall consist of no less than five contiguous blocks. Two blocks that touch at any point shall be considered to be contiguous. Clusters need not be contiguous but shall be proximate and located within the same geographic area.

(3) the total area covered by an application shall not exceed 250 blocks.



DISCUSSION TO THE SUGGESTED REVISIONS TO THE DRAFT REGULATIONS

1. The model suggests that a **block** size of about **20 square kilometres** is a cell of a grid as provided by the Authority and no more than 5 blocks comprise of a **100 square kilometres cluster**. This model is made in conformity with the distribution of the Cobalt-rich Crusts on the seamounts, especially the seamounts and Cobalt-rich crust characteristics located on the water depth shallower than 2500 meters.

2. The model doesn't illustrate an economic evaluation ,thus some of the parameters are very difficult to be determined, such as the Annual production, Crust thickness and square-metre tonnage.

3. If we use a 2 million wet tonnes annual production for 20 years of operation and 0.7 coverage of Cobalt-rich crusts in the contractor's nominate blocks, the other parameters are referenced to the model, the resources of 500 square kilometres, or 25 blocks is far from sufficiency.

$500 \text{ km}^2 * 2.5 \text{ cm} * 1.95 \text{ g/cm}^3 * 0.82 \text{ (efficiency)} * 0.7 \text{ (coverage)} = 1399 \text{ million wet tones.}$

If we consider the 2 million dry tonnes annual production for 20 years of operation, the condition of the technology and economics in mining of 500 square kilometres nominate blocks is much insufficient.

DISCUSSION TO THE SUGGESTED REVISIONS TO THE DRAFT REGULATIONS

In fact, not all blocks are full covered by the crusts. Some areas of the blocks are covered by sediments or base rocks(fig. 1). whatever the exploration or the nominate blocks for the contractor.

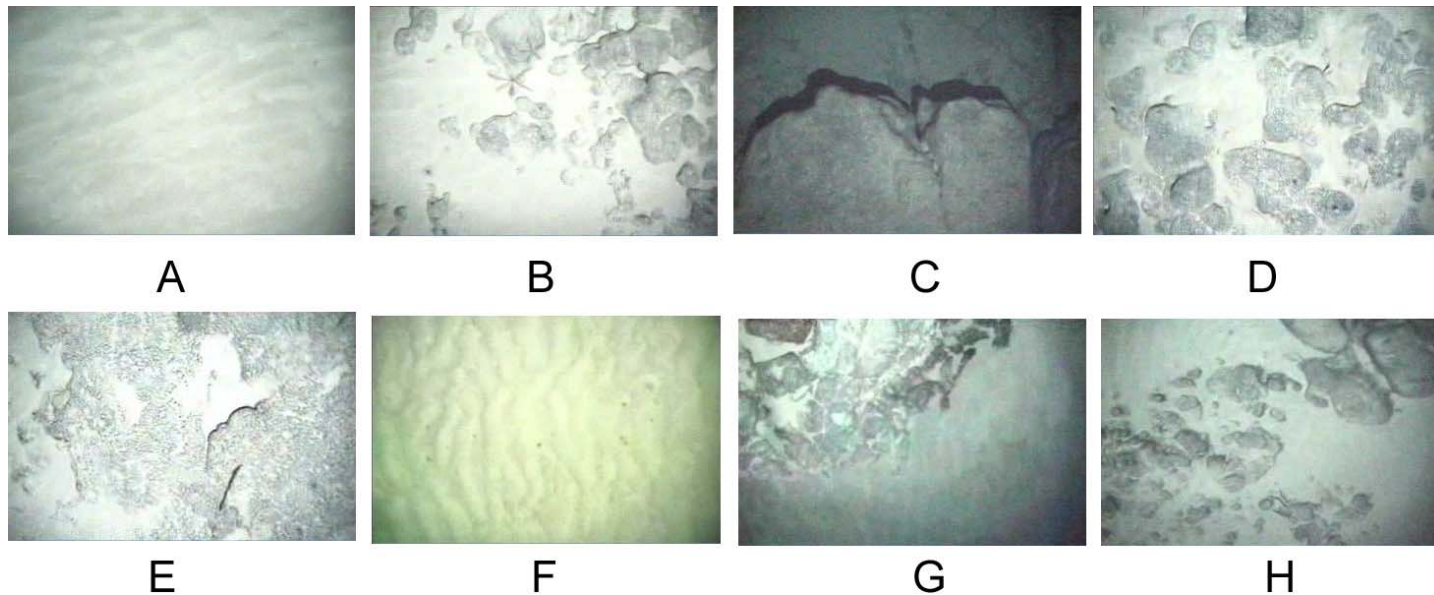


Fig.1 The photo picture by TV camera showed the Crusts covered by the sediments(whiteness). The location on the seamounts of A-H identified in Fig.3 where the water depth and slope is variational.



DISCUSSION TO THE SUGGESTED REVISIONS TO THE DRAFT REGULATIONS

5. Based on the present knowledge about the extraction technique and mining operation, the estimated efficiency of 0.82 is too high. Generally, the efficiency may be less than 0.3 referenced to the mining model of the ferromanganese nodules.

6. According to the subbottom profiler, seismic, grab sampling, coring sampling, TV grab investigation on the north-equatorial Pacific seamounts by COMRA, most flat surface area of the guyots are covered by sediment with tens of meters thickness. (fig.2) where there is no distribution of crusts. At the edge of the guyots, there are the area with rough slope ten to twenty degree in topography(fig.3) where mining is impossible with present mining technology. According to our statistics, 75 percent of the flat-top of the seamounts are covered by sediments, which should be cut-off for exploration.

DISCUSSION TO THE SUGGESTED REVISIONS TO THE DRAFT REGULATIONS

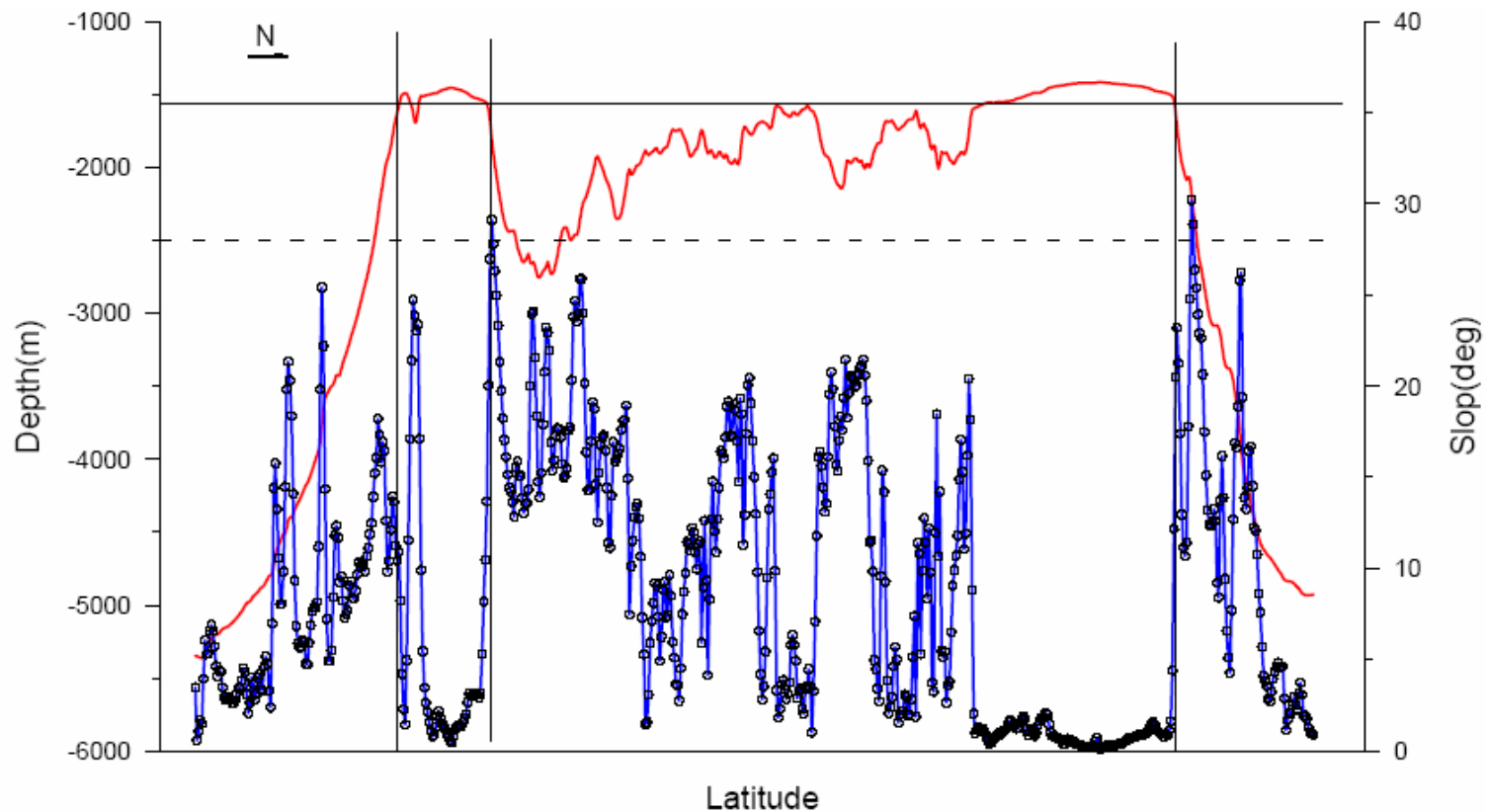


Fig. 2 The relationship of water depth vs slope of a typical guyot by multibeam bathymetry.

DISCUSSION TO THE SUGGESTED REVISIONS TO THE DRAFT REGULATIONS

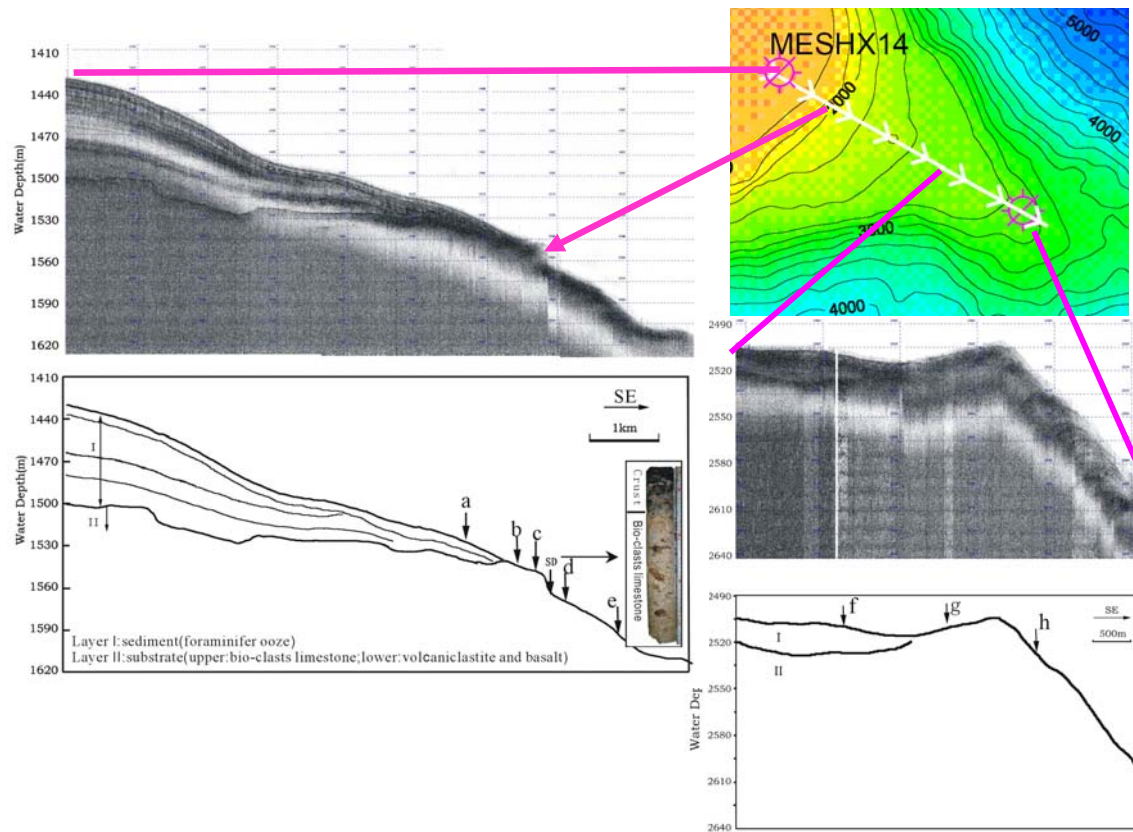
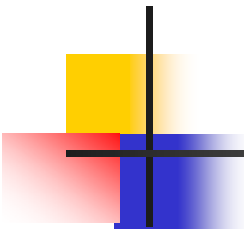


Fig. 3 Subbottom profiler showed that tens of meters sediments cover the surface of the summit and the small scale rough edge of the guyot. The coring sample showed the depth of the sediments. The surface distribution of the crusts is showed in Fig.1 .



SUPPLEMENTARY SUGGESTED REVISIONS TO ISBA/12/C/3/Part 1

1. Based on the present mining technology and the economic evaluation, we suggest that final mining blocks totaling to 2800 square kilometres is appropriate for contractor. Which could sustain the mining operation of 2 million wet tonnes annual production for 20 years by contractor with a 0.3 efficiency such as:

$$2800 \text{ km}^2 * 2.5 \text{ cm} * 1.95 \text{ g/cm}^3 * 0.3 \text{ (efficiency)} = 4095 \text{ million wet tones}$$

2. A total exploration area of 10,000 square kilometers is a good choice to provide to contractor before further scientific identification and technology for the exploration and mining of crusts is present.

3. Even though the block clusters may be non-contiguous, it is needed to limit the number of seamounts. This is in conformity with the the common heritage principle.



SUPPLEMENTARY SUGGESTED REVISIONS TO ISBA/12/C/3/Part 1

we suggest the revisions as follows

Definition:

Subblock is a cell of a grid as provided by the Authority, no greater than 20 square kilometres.

Block is comprised of five contiguous subblocks, no greater than 100 square kilometres

Cluster is comprised of several continuous subblocks.

Exploration area is comprised of several clusters, no more than 100 blocks and no greater than 10000 square kilometres.



SUPPLEMENTARY SUGGESTED REVISIONS TO ISBA/12/C/3/Part 1

Regulation 12

Total area covered by the application (cobalt-rich crusts)

(1) The exploration area for approval of each application for cobalt-rich crusts shall be not greater than 10000 square kilometres, comprised of not more than 100 blocks(500 subblocks).

(2) The exploration area may be comprised of several clusters. Two clusters that touch at any point shall be considered to be contiguous. Clusters need not be contiguous but shall be proximate and located within the same geographic area.



SUPPLEMENTRY SUGGESTED REVISIONS TO ISBA/12/C/3/Part 1

Regulation 27

Size of area and relinquishment

(1) The contractor shall relinquish the subblocks allocated to it in accordance with paragraphs 2, 3 and 4 of this regulation.

(2) By the end of the fifth year from the date of the contract, the contractor shall have relinquished:

(a) at least 40 per cent of the total number of subblocks allocated at to it;

(b) if 40 per cent of that number of subblocks is a whole number and a fraction, the next higher whole number of the subblocks.

(3) By the end of the tenth year from the date of the contract, the contractor shall have relinquished:

(a) at least 65 per cent of the number of subblocks allocated to it; or

(b) if 65 per cent of that number of subblocks is a whole number and a fraction, the next higher whole number of the subblocks.



SUPPLEMENTARY SUGGESTED REVISIONS TO ISBA/12/C/3/Part 1

Regulation 27

Size of area and relinquishment

At the end of the fifteenth year from the date of the contract, or when the contractor applies for exploitation rights, whichever is the earlier, the contractor shall nominate up to 140 subblocks from the remaining number of blocks allocated to it, which shall be retained by the contractor. Where the size of the exploration area originally allocated to the contractor was less than 10000 square kilometres, the contractor shall nominate no more than 28 per cent of that original number of subblocks to be retained. If 28 per cent of that number of subblocks is a whole number and a fraction, the contractor shall nominate the next higher whole number of subblocks.



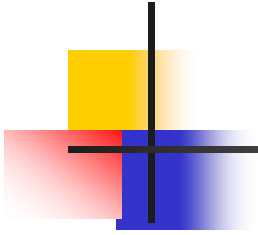
SUPPLEMENTARY SUGGESTED REVISIONS TO ISBA/12/C/3/Part 1

Regulation 27

Size of area and relinquishment

Assuming an initial allocation of 500 subblocks, the contractor would relinquish as follows:

- 40 per cent with 200 subblocks at year 5;**
- 65 per cent with a further 125 subblocks at year 10;**
- 72 per cent with a further 35 subblocks at year 15;**
- leaving it with 140 subblocks for exploitation.**



Thank you