



Legal and Technical Commission

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Evaluation of the annual reports submitted by contractors

Report and recommendations of the Legal and Technical Commission

I. Introduction

1. The Legal and Technical Commission met during the tenth session of the International Seabed Authority to consider and evaluate the annual reports of contractors submitted pursuant to the Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area (“the Regulations”). The Commission was provided with a report prepared by the Secretariat on the status of annual reports received from contractors (ISBA/10/LTC/2).

2. It was noted that the third set of annual reports by contractors was due to be received at the end of March 2004. As of 19 April 2004, annual reports had been received from all the seven contractors, i.e., Deep Ocean Resources Development Ltd. (DORD); the Government of the Republic of Korea; China Ocean Mineral Resources Research and Development Association (COMRA); State Enterprise Yuzhmorgeologiya (Russian Federation); Interoceanmetal Joint Organization (IOM); l’Institut français de recherche pour l’exploitation de la mer/l’Association française pour l’étude et la recherche des nodules (IFREMER/ AFERNOD); and the Government of India.

3. In its evaluation of the reports for 2002 (ISBA/9/LTC/2), the Commission noted that there were a number of elements missing from some of the reports and therefore made specific recommendations for the submission of additional data and information by the contractors concerned in relation to those elements (ISBA/9/LTC/2). As of 10 May 2004, the following contractors had submitted to the Secretary-General of the Authority additional data and information with respect to their annual reports for 2002 for evaluation by the Commission at its meeting during the tenth session of the Authority: China Ocean Mineral Resources Research and Development Association (COMRA),

the Government of the Republic of Korea, and the State Enterprise Yuzhmorgeologiya (Russian Federation).

4. The subcommittee, composed of Dr. Arne Björlykke, Dr. Helmut Beiersdorf and Dr. Rodrigo Miguel Urquiza Caroca, carried out a preliminary study of the annual reports and prepared a draft evaluation for consideration by the full Commission.

II. Evaluation of annual reports and recommendations

5. The Commission noted with appreciation that, in general, the contractors followed the format and structure for annual reports recommended by the Commission during the eighth session (ISBA/8/LTC/2, annex).

6. It was recalled that, during the ninth session, the Commission suggested that a preliminary analysis of some of the more technical data and information contained in the annual reports be conducted by the Secretariat to assist the subcommittee in its work (ISBA/9/LTC/2). It was further recalled that another suggestion was also made that it would be beneficial if the Authority could have an overall summary of the status of environmental monitoring and assessment being undertaken by contractors, with the consent and involvement of the contractors, which would be useful for a full understanding of those activities (ISBA/9/LTC/2). The Commission noted with appreciation that these suggestions were taken note of and, in general, accommodated by the Secretariat with the cooperation of contractors. It appreciated the expeditious preliminary evaluation of annual reports undertaken by the subcommittee to facilitate the evaluation of the reports by the full Commission.

A. Deep Ocean Resources Development Co. Ltd.

1. Review of 2003 annual report

7. DORD submitted its annual report for 2003 in both hard-copy and electronic format on 5 March 2004. The report was structured in line with the afore-mentioned headings and content list recommended by the Commission.

Exploration Work

8. The report of DORD was mainly devoted to a description of the activities covered within its five-year plan of work. It indicated that in 2003 the kriged maps of nodules abundance and metal grade were compiled with available information on seabed topography. A series of maps of abundance and metal grades showing the areas where the slope was higher than 5 degrees were provided. No explanation on methods, technical specifications or error

margins was provided. The maps showing abundances and metal content give an interesting and good overview. The Commission recommends that DORD publish a map indicating economic value based on the same parameters.

Mining test and mining technology

9. In accordance with the plan of work, DORD did not carry out mining tests or mining technology operations.

Training

10. In accordance with the plan of work, no training was carried out.

Environmental monitoring and assessment

11. In accordance with the programme of activities, DORD did not carry out environmental work.

Financial statement

12. The report of DORD contains a breakdown of expenditure. Due to a required audit on the expenditure to be conducted in mid May, DORD submitted on 18 May 2004 a certificate of its expenditure on exploration activities in 2003.

Proposed adjustments to the programme of activities

13. No adjustments to the programme of activities were proposed.

2. Recommendations

14. The report is in accordance with the work plan and the Commission recommends that the report be accepted.

B. State Enterprise Yuzhmorgeologiya

1. Supplement to the review of 2002 annual report

15. In the evaluation of annual reports during the ninth session, the Commission recommended that, in accordance with its suggestions in ISBA/8/LTC/2, annex, the long-, and medium- and short-term objectives of the Yuzhmorgeologiya programme be stated. The Commission also recommended

that a statement of the amount of nodules recovered be obtained from the contractor. On 25 March 2004, Dr. A. Pronkin, Director-General of Yuzhmorgeologiya, sent a letter to the Secretary-General of the Authority to inform that during the exploration activities of Yuzhmorgeologiya in 2002, no polymetallic nodules were recovered from the seabed, and requested that the letter be considered as an addendum to the annual report of Yuzhmorgeologiya on its exploration activities for the year of 2002. However, no statement was given on long-, medium-, and short-term objectives of the Yuzhmorgeologiya programme, as recommended by LTC.

2. Review of 2003 annual report

16. Yuzhmorgeologiya submitted its annual report for 2003 in both hard-copy and electronic format on 25 March 2004. The report was submitted in the Russian language. The report followed the structure and format recommended by the Commission under the headings and standardized content list. The addition of "Other Activities" can be regarded as useful information to the Authority. The electronic format submitted by the contractor, a compact disk attached to the hard-copy of the report, contains text of the report only. Charts, illustrations and maps incorporated in the hard-copy of the report were not included in the compact disk.

Exploration Work

17. Yuzhmorgeologiya reported that bathymetric survey with multibeam echo sounding system, sonar side-scan survey, continuous television and photograph survey and collection of bottom sampling data were carried out in the Western and Eastern Reference Zones of the contract area. An area of 47,200 square kilometres was surveyed and a total of 61.9 kg of polymetallic nodules were reported to be collected. The contractor indicated that acquired data had been processed and analysed during this reporting period, but this work would be concluded and reported in the 2004 report. Yuzhmorgeologiya's report presented a description of the equipment, software and methodology used, as well as the amount of data collected. A description of the results obtained was also provided in the form of illustrations, graphs and tables (bathymetry, general morphological characterisations, nodule cover and classification of nodule types, acoustic facies distribution).

Mining test and mining technology

18. In accordance with the plan of work, Yuzhmorgeologiya undertook no mining tests or mining technology operations.

Training

19. In accordance with the plan of work, no training was carried out.

Environmental monitoring and assessment

20. In 2003 Yuzhmorgeologiya studied baseline conditions by carrying out meteorological observations during the cruise taken as part of their exploration work. Description of the various conditions was given along with graphical representations.

Financial statement

21. The report contained a certified financial statement of expenditure of activities in 2003.

Proposed adjustments to the programme of activities

22. Yuzhmorgeologiya proposes an adjustment of the total expenditures covering the years 2001 through 2005 to between US\$8,000,000 and US\$10,000,000.

3. Recommendations

23. The Commission recommends that the report be accepted.

C. China Ocean Mineral Resources Research and Development Association**1. Supplement to review of 2002 annual report**

24. During evaluation of annual reports for 2002 at the ninth session, the Commission recommended that the contractor be requested to supply details of sample location and analytical results, both from exploration work and environmental studies, summarized in illustrative chart or graphical form, as well as in tables. It also recommended that the contractor be asked to supply additional substantive details of the mining test initiatives, including results. COMRA submitted to the Secretary-General on 31 March 2004 additional data and information to its annual report for the year of 2002. These data and information include three parts, i.e., Part I (Exploration) which contains a table showing 107 sample locations in COMRA's contract area in 2002; Part II (Environmental Baseline Survey and Studies) which provides a table on average value of marine chemistry analyzed at three stations in COMRA's contract area in 2002; and Part III (Mining Test) which is a description of COMRA's two major tasks completed in 2002.

2. Review of 2003 annual report

25. COMRA submitted on 30 March 2004 its annual report for 2003 in both hard-copy and electronic format. The report was submitted in both Chinese and

English. The report was structured in line with the list of content recommended by the Commission, but does not refer to item “Amount of nodules extracted from the seabed” specifically (the number appears somewhere in the text: 336 kg + 5272 kg).

Exploration Work

26. During this reporting year, COMRA continued to carry out the resource exploration and evaluation of the quality and quantity of polymetallic nodules from their contactor area. As a result, COMRA was able to acquire significant information on the location and evaluation of commercial mining sites and to determine initial mining test areas. COMRA also reported that, in order to meet the demands for the experiment of ore dressing and metallurgy, some nodules were collected.

27. This exploration work was reportedly carried out by R/V *Dayang Yihao* and *Haiyang Sihao*, which undertook joint cruises lasting 70 days to conduct a survey on an area of approximately 770 km² located within the eastern COMRA contract area. COMRA provided information on exploration equipment used, including number and type of operations, quantity and weight of samples obtained during this work. It reported that 336 kg and 5,272 kg of wet nodules were collected. A table containing the coordinates of surveyed stations was provided. A description of the results of analysis was also provided, including physical properties of sediments, abundance, shape, and size of nodules as well as a chart illustrating the relationship between nodules abundance and grade of nodules.

Mining test and mining technology

28. COMRA provided information on the tasks they accomplished in relation to the development of a mining system and pre-pilot tests on extractive metallurgy of polymetallic nodules. Tables showing the results obtained were also provided.

Training

29. In accordance with the plan of work, no training was carried out.

Environmental monitoring and assessment

30. COMRA carried out a cruise by R/V *Dayang Yihao* in 2002 using a great variety of oceanographic, marine biological and geological tools and the annual report for 2003 gave a list of the parameters that were sampled.

Observations on residues produced during mineral processing and metal leaching were reported.

Financial statement

31. COMRA provided a certificate for the statement of the actual and direct exploration expenditure in 2003.

Other activities

32. Information on a Polymetallic Nodule R & D information system and the Integrated Information System on R/V Dayang Yihao, and on COMRA's sample management is given in the report. This is useful additional information provided by the contractor, but not required by the plan of work.

Future Work Plan

33. In addition to the continuation of activities related to the approved plan of work, COMRA will continue its participation in the international programmes on the geological model of the CCZ and environmental impact of seabed mining initiated by the Authority. This is useful additional information provided by the contractor, but was not required by the plan of work.

Proposed adjustments to the programme of activities

34. No adjustments to the programme of activities were proposed.

3. Recommendations

35. The Commission recommends that the report be accepted.

D. Government of the Republic of Korea

1. Supplement to review of 2002 annual report

36. In the evaluation of annual reports during the ninth session, the Commission recommended that the contractor be requested to supply additional information regarding the mining technologies undertaken in the reporting year, with details including description of equipment, operations and, where relevant, results of tests. The Government of the Republic of Korea submitted to the Secretary-General on 30 March 2004 a supplementary report for 2002 report which contains information on research of mining technology.

The data and information include description of collector and integrated mining operation technology, description of development of lifting system and results of the lifting system tests. The Commission finds the supplement to the report of 2002 satisfactory to the Commission with regard to its request for information (ISBA/9/LTC/2).

2. Review of 2003 annual report

37. The Government of the Republic of Korea submitted its annual report for 2003 in both hard-copy and electronic format on 30 March 2004. The report followed the suggested headings and content list recommended by the Commission. It also included a summary of the report, and information on “other activities”.

Exploration Work

38. The contractor reported that a one-month geological, geophysical and nodule distribution survey was conducted. A total of 28 kg of nodules was collected. Samples and data acquired were analyzed on board of R/V *Onnuri* and then post-processed in various geophysical laboratories of KORDI. The contractor provided a description of the equipment and methods used and the contractor has provided necessary information on abundances and metal contents.

Mining test and mining technology

39. The contractor presented a synthesis of the results obtained from the research and development works carried out on mining technologies, including collecting, lifting and processing equipment. A description of the study and its results carried out on leaching, separation, and recovery stems of smelting-leaching process were also provided.

Training

40. In accordance with the plan of work, no training was carried out.

Environmental monitoring and assessment

41. Two research cruises were carried out in 2003 and one of these was for environmental work. Some sediment chemical information was presented along with an inter-annual comparison, though not in the section on environmental work. Water column characteristics were presented along with comparisons between sediment cores at different stations.

Financial statement

42. The report contains a financial statement with a breakdown of the expenditure and a certificate of expenditure was provided.

Additional information provided by the contractor.

43. The Commission commented in the evaluation of the report of 2002 that a list of publications from the activities would have been useful and the commission would like to see a publication list in the report of 2004.

Proposed adjustments to the programme of activities

44. No adjustments to the programme of activities were proposed.

3. Recommendations

45. The Commission recommends that the report be accepted.

E. Interoceanmetal Joint Organization**1. Review of 2003 annual Report**

46. IOM submitted its annual report for 2003 in both hard-copy and electronic format on 31 March 2004. The report was submitted in English as previously requested by the Secretary-General of the Authority. It was generally structured in line with the content list recommended by the Commission under the following headings: introduction, contract activities, IOM's exploration expenditures in 2003 under the contract with ISA, and amount of polymetallic nodules extracted from the seabed. The report also contains two annexes. The electronic format of the report, a compact disk, was also submitted by the contractor. However, the compact disk does not contain the six maps of geomorphology and bottom sediments in the relevant exploration area of the IOM.

Exploration Work

47. In accordance with the plan of work, during the period of this annual report, IOM carried out no geological or geophysical survey. Consequently no data, including nodules samples were collected from the seabed. IOM continued to process and analyse the geomorphological and sedimentary data, which were collected in IOM exploration area during the geological exploration survey carried out in 2001.

48. The report provided a description of the results obtained from the geomorphological framework analysis of a relevant part the IOM exploration

area. The description was illustrated by a 1:500,000 map showing the location of geomorphological, volcanic and tectonic structures and indicating areas where seafloor inclination was higher than 7 degrees. The map also indicated the relationship between the seafloor relief and the polymetallic nodule abundance identified during the geological exploration survey carried out in 2001.

49. With regard to the sediments, the report offered an explanation of the general characteristics and sediment distribution, and presented a description of sedimentary formations and units in the relevant part of IOM's contract area. The Commission suggests that formation names not to be used any more for the CCZ due to the time-transgressive nature of the sediment. In addition, the physico-chemical, mineralogical, and geotechnical characteristics, as well as granulometry and mineralogy of the coarse sub-fraction of bottom sediments were analysed, described and synthesized in several tables.

50. There was no description on the equipment, methodology, software or error margin of the analysis with regard to the geomorphology and sediments.

Mining test and mining technology

51. Studies of nodule processing and metal extraction systems were undertaken by various IOM member institutes and described briefly in the report.

Training

52. In accordance with the plan of work of the contractor, no work was carried out.

Environmental monitoring and assessment

53. In 2003 IOM carried out a qualitative and quantitative analysis of digital photographs taken during a research cruises in 2001. A description was given of the mega fauna observed on each transect comparing nodule and nodule-free areas.

Financial statement

54. Due to IOM's domestic procedures for certifying and approving the financial statement of the exploration expenditures, a certified financial statement of IOM' exploration expenditures in 2003 was submitted on 18 May 2004 and received by the Secretary-General of the Authority on 25 May 2004.

Proposed adjustments to the programme of activities

55. No adjustments to the programme of activities were proposed.

2. Recommendations

56. The Commission recommends that the report be accepted.

F. Government of India

1. Supplement to the review of 2002 annual report

57. In the evaluation of annual report during the ninth session, the Commission recommended that details of the samples taken and results from the 2002 survey, sampling and analysis programmes should be provided in chart form as well as in tables. It also recommended that an appropriately certified financial breakdown for the activities undertaken in 2002 be provided by the former. As of 10 May 2004, the Secretary-General had not received from the Government of India the aforementioned breakdown. The Commissions will not recommend that the report of 2003 be accepted before the Secretary-General has received the information.

2. Review of 2003 annual report

58. The Government of India submitted its annual report for 2003 with electronic format on 31 March 2004. The report was structured in line with the list of content recommended by the Commission under the following headings: introduction, survey and exploration, environmental impact assessment study, technology development (mining), metallurgy, and expenditure.

Exploration Work

59. The contractor reported that one 35-day cruise was taken during this reporting period. In response to the recommendations by the Commission for more details and results of the survey, as indicated in paragraph 64 of ISBA/9/LTC/2, the contractor reported that during the cruise 44 operations with the “ocean” grab were undertaken to collect nodules and associated sediments from its contract area. A preliminary abundance analysis was conducted. A location map and a table containing information on the collected data were provided. The contractor also provided three other tables where the results of this analysis were compared with the findings obtained from previous data acquired with the free fall grabs. The Commission hopes that the metal content of the samples will be reported in the 2004 report. A map showing the distributions of abundances, metal content and metal value would have made the report easier to read. The contractor also stated that during this reporting year, a systematic data archival retrieval system was developed. Although nodule abundance figures were provided for sample locations, no total amount of recovered nodules (in kg) was provided.

Mining test and mining technology

60. The report described the objectives and main lines of activities of the programme carried out to develop mining and metallurgy technology. Regarding the mining technology, it was reported that two bathymetric surveys were conducted during this reporting year to identify a suitable flat area about 500 meters deep to carry out the operational test of the underwater crawler. As a result, two sites were selected. The report further stated that the core samples collected from the sites are being tested to identify properties including the bearing and shear strength of the samples. The Commission considers that the shear strength of the bottom sediment is important for sea floor mining.

61. With reference to metallurgy technology, it was reported that during this reporting period activities were focused on the generation of experimental data and leaching process improvement. About 140 batches of nodules were processed during the year and technical information generated. As a result the contractor was able to improve some process parameters. In addition, the pilot plant operated at its rated capacity and metal recovery showed significant improvement.

Training

62. In accordance with the plan of work, no training was carried out.

Environmental monitoring and assessment

63. The environmental work presented by the Government of India concerned the ongoing INDEX (Indian Deep-Sea Environmental Experiment) project. As has been mentioned in previous annual reports, phases I and II have been completed and a cruise was carried out in 2003 concerning Phase III (recolonisation after disturbance). Some of the samples taken were used for their environmental database, the remainder were used for the INDEX project. Samples were taken using the same methodology as previous cruises and in the same locations wherever possible for accurate comparisons. A map of all of the sample stations was given along with methodology of how the samples were taken. Descriptions of each sample were given without any scientific results or analysis. References to publications were the materials has been used would have been most welcome. The sediment plume dispersion was described in a general way. Reference to scientific papers would have increased the quality of the report.

Financial statement

64. The report did not contain a breakdown of expenditures, nor did it contain a certificate of expenditures. The Commission recommends that such a statement be submitted to the Secretary-General before the end of the year.

Additional information provided by the contractor

65. LTC is impressed by the R&D activity and we suggest that a list of publications be annexed to the report

Proposed adjustments to the programme of activities

66. No adjustments to the programme of activities were proposed.

3. Recommendations

67. The Commission suggests that the report not be accepted until financial statement with a breakdown of the expenditure is submitted to the Secretary-General.

**G. L'Institut français de recherche pour l'exploitation de la mer/
l'Association française pour l'étude et de la recherche de nodules
(IFREMER/AFERNOD)**

1. Supplement to review of 2002 annual report

68. In the evaluation of annual reports during the ninth session, the Commission recommended that the contractor submit an appropriately certified financial statement for both 2001 and 2002, taking into account the comments made in paragraph 95 of ISBA/9/LTC/2. However, as of 4 May 2003, the statement had not been received.

2. Review of 2003 annual report

69. IFREMER/AFERNOD submitted its annual report for 2003 in hard—copy and electronic format on 9 April 2004 in French language. The report generally followed the headings and content list recommended by the Commission and devoted its first part to “participation in international activities of the ISA”, instead of “exploration work”. The report concentrated on “Environmental studies” which described one of the principal activities in 2003- preparation work conducted for the Nodinaut cruise scheduled for 15 May to 28 June 2004 by the vessel NO *L'Atalante* with the submersible *Nautile*. The missions of the cruise include survey of benthic communities in the French areas and the main characteristics of their habitat in order to gather baseline data for the study of the environmental consequences of nodule mining.

Exploration Work

70. In accordance with the contractor's plan of work, no exploration activities were carried out during this reporting period.

Mining test and mining technology

71. In accordance with the plan of work, IFREMÉR/AFERNOD did not carry out mining tests or mining technology operations.

Training

72. In accordance with the plan of work, no training was carried out.

Environmental monitoring and assessment

73. In 2003 the environmental work of IFREMÉR comprised of preparing a cruise, which was discussed in the 2002 annual report. This included obtaining maps of nodule facies to select sampling positions. IFREMÉR also created a jointly funded 18-month research position with the Authority beginning in December 2003.

Financial statement

74. The report contains a certified financial statement of the expenditures in 2003.

Proposed adjustments to the programme of activities

75. No adjustments to the programme of activities were proposed.

3. Recommendation

76. In general, the report does follow the format recommended by Commission. It diverges only slightly by adding a new item, which refers to supporting activities of the Authority (i.e., developing a geological model for the CCZ). This is not part of the plan of work. Nevertheless, the Commission recommends that the report be accepted.
