Beijing Pioneer Hi-Tech Company（BPC）'s position and viewpoint on the payment regime and financial model of polymetallic nodule exploitation project, as well as the profit sharing of transfer of exploitation contract right

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Contents

1. Payment regime and financial model of polymetallic nodule exploitation project

1.1 《The United Nations Convention on the Law of the Sea》 and 1994 《Agreement relating to the implementation of Part XI of UNCLS》are the theoretical basis for the payment regime and financial model design of exploitation project

《The United Nations Convention on the Law of the Sea》 stipulates that international seabed areas and their resources beyond the limits of national jurisdiction are the common heritage of mankind. The main points on the payment regime and financial model design in the 1994《Agreement relating to the implementation of Part XI of UNCLS》 are as follows：

（1）The system of payments to the Authority shall be fair both to the contractor and to the ISA and shall provide adequate means of determining compliance by the contractor with such system;

（2）The rates of payments under the system shall be within the range of those prevailing in respect of land-based mining of the same or similar minerals in order to avoid giving deep seabed miners an artificial competitive advantage or imposing on them a competitive disadvantage;

（3）The system should not be complicated and should not impose major administrative costs on the ISA or on a contractor. Consideration should be given to the adoption of a royalty system or a combination of a royalty and profit-sharing system. If alternative systems are decided upon, the contractor has the right to choose the system applicable to its contract. Any subsequent change in choice between alternative systems, however, shall be made by agreement between the Authority and the contractor.

1.2 We should have a complete, accurate and profound understanding of the meaning of royalty collected by ISA. We believe that the best and legal way for ISA to obtain income （or revenue） is through royalty. In the international seabed area, the royalty is the rent collected by the ISA for the transfer of mineral resources assets in the international seabed area. The maximum amount of money that the ISA can charge for a exploitation contract is the resource

rent of the entire mining area.

（1） The meaning of royalty

We should have a complete, accurate, and profound understanding of the meaning of the "royalty" that mining contractors need to pay to the ISA, as well as the meaning of other natures of "taxes" and "fees" that mining contractors need to pay to the Authority.

For land mining, the royalty is the return paid to the mineral resource owner（referring to the country）after the ore is mined from underground. Royalties are the benefits that a country should receive based on its status as the owner of mineral resources, In essence, it is the value of the rent of mineral resources assets under the nature state. During the execution of the exploitation contract of polymetallic nodules, The ISA representing to all mankind as owners of the resources of the international seabed area to obtain exploitation benefits , which is paid by the contractor to the ISA for using the concession right.

The United Nations regards royalty as rent for mineral resources rather than taxes. Royalties are the benefits that a country should receive based on its status as an owner of mineral resources, In the international seabed area， country is replaced by ISA. This "mineral resource" specifically refers to mineral resources in their original natural state, rather than discovered and explored by investors, such as the amount of mineral resources, mineral reserves, etc. This viewpoint is clearly expressed in the United Nations' 《System of Environmental—Economic Accounting 2012—Central Framework》（SEEA—Central Framework）.

All countries refer to the fees paid by mining rights holders for using mineral resources as royalties, and the United Nations 《SEEA—Central Framework》defines royalties as natural resource rents. The collection of rent between the two sides is a contractual relationship of property leasing, and some major mineral resource countries in the world use the form of "mining lease" for mining rights. In the international seabed area, the benefits obtained from the exploitation of international seabed mineral resources by the ISA are "resource rent", not "tax". If the benefits

obtained from the transfer of ownership of seabed mineral resources by the ISA are considered as "tax", it goes against the essence of the property use of natural resources and confuses the concept of power and property.

Royalties reflect the economic benefits of mineral resources being owned by the country（In the international seabed area, the country is replaced by the ISA）. Whether in accordance with the United Nations《SEEA—Central Framework》or in accordance with the mining laws of various countries, royalties are collected after the ore is mined, processed, and sold. Some countries' mining laws refer to them as "production royalties" to represent the fees collected after production.

（2） Resource rent is a representation of the value of mineral resource assets, and the owner's right and intrest of mineral resources is the value of mineral resources in their natural state, known as "resource rent".

According to the definition of "resource rent" by the United Nations SEEA, for mineral resources, it refers to the value of mineral resource assets in their natural state. Resource rent "can be regarded as the return obtained by the asset itself... It refers to the accrued residual value of an asset's exploiter or user after deducting all expenses and normal returns." In other words, it is a mining asset. After deducting all costs, taxes and normal returns from investors, the remaining part of its income after exploitation is resource rent, Resource rent is considered the value of mineral resources in their original natural state.

The estimation method for mineral resource rent is represented by the following formula:

Mineral resource rent = Sales revenue of mineral products —

Total cost of mineral products — Normal return on mining investment

The explanations for each part of the formula are as follows:

- Mineral resource rent： The value of mineral resources in their natural state.
- Sales revenue from mineral products: The market sales revenue from the manufacture of mineral resources into mineral products.
- Total cost of mineral products: including investment costs, exploration costs,

operating costs, and various government taxes and fees (including corporate income tax, but excluding resource fees such as royalties) for manufacturing mineral resources into mineral products.

• Normal return on mining investment: The return that mining rights holders should receive when investing in exploitation.

Although the estimation method of resource rent is as indicated by the above formula, the government （country）may not charge the estimated amount after the estimation.

The text of the United Nations《SEEA— Central Framework》states: “The collection of resource rent is generally completed by the government through mechanisms such as fees, taxes, and royalties. In fact, the fees, taxes, and royalties collected are often lower than the resource rent, as other priorities may be considered when setting rates, such as encouraging investment and employment in the mining industry. These other motivations should be taken into account when using charging methods”. The main form of mineral resource rent in various countries is royalties. Except for a very few countries, countries around the world generally collect royalties in accordance with this spirit, and their amount is usually lower than the actual value of resource rent. The mining management of governments in various countries focuses more on issues such as resource security, employment expansion, and environmental protection. Therefore, they do not take away all the benefits belonging to resource owners, but rather provide mining rights holders with sufficient funds to ensure resource supply, provide employment opportunities, and increase environmental protection.

From the above analysis and analogy, we believe that:

（1）In the international seabed area, the rights and interests of the ISA as the owner of seafloor mineral resources are the value of mineral resources in their natural state, known as "resource rent". In polymetallic nodule exploitation project （exploitation contract）, the maximum amount of money that the ISA can charge for the exploitation project （exploitation contract）is the resource rent of the entire mining area, rather than the maximum profit sharing of exploitation project.

（2） In the MIT model, there is a significant deviation between the guiding principle of ISA charging based on maximum profit sharing and the meaning of "resource rent" in this paper and the spirit of charging royalties for land mining.

1.3 Principles for designing payment regime and financial model for polymetallic nodules exploitation project in the international seabed area

We believe that the payment regime and financial model for polymetallic nodule project in the international seabed area should be designed according to the following principles:

（1） The principle of the common heritage of mankind

The contractor of exploitation of polymetallic nodule must pay royalty to ISA during commercial production, which is the obligation and responsibility of the contractor, reflecting the principle that polymetallic nodule resources are the common heritage of mankind.

（2）Principle of balance of interests

The design of the royalty payment regime protects the reasonable benefits of contractor and reflects the distribution of benefits between the interests of all mankind （ISA's benefits） and mining enterprise contractors. The design of the payment regime should balance and give consideration to the two sides. The amount of fees paid by the contractor to ISA should be appropriate, so that ISA can receive the benefits it deserves, while not imposing excessive financial burden on the contractor, so as to ensure the continuous and smooth operation of the contractor's commercial production.

（3）Principle of operability

The design of the royalty payment regime should strive to be scientific, reasonable, concise, and easy to operate, making the payment process and audit easy to implement.

（4） Principle of transparency

The use of open market ore transaction price and ore transaction volume to calculate royalty, to achieve openness and transparency.

1.4 On the reasonability of payment regime

Royalty rates and levies vary from country to country. There are four main methods:

(1) Levying based on quantity：a fixed rate（such as USD/ton）is set according to the unit of mineral products, and the amount of products sold is calculated as the base.

(2) Levying based on profits: a rate (%) shall be set on the basis of the profits from the sale of mineral products, and levied on the basis of the profits obtained from the sale of mineral products;

(3) AD valorem levying: a rate (%) shall be set according to the sales price of a unit of mineral products, calculated and levied on the basis of the sales income of mineral products;

(4) Mixed levying： the levying is based on sales revenue, and the tiered rate is determined according to profit, or different charging methods are adopted according to different kinds of mineral products.

AD valorem royalty can make the amount of royalty charged fluctuate with the price. It is a method that conforms to the law of the market. It can avoid unreasonable overpayment when the price is low, and avoid unreasonable underpayment when the price is soaring. At present, this method is adopted by most countries.

AD valorem royalties are calculated by:

$$R = k \times Pv \times Q = k \times W$$

Where, R is the royalty of mineral products sold during the payment period, k is the royalty rate (%), Pv is the price of a unit mineral product, Q is the quantity of mineral products sold during the payment period, and W is the sales revenue of mineral products. In the above formula, mineral products are raw ores.

Kircain and Roth et al.（2019，2020，2023）proposed a payment model for polymetallic nodule project（referred to as the MIT model）. The MIT model adopts a

cash flow method to design a payment regime with the goal of maximizing the return obtained by ISA. The MIT mode provides four optional payment models:

（1） Fixed ad valorem — one stage

（2） Fixed ad valorem — two stage

（3） Blended Profit — two stage（fixed ad valorem 1st stage, blended profit & fixed ad valorem 2nd stage）

（4）Variable ad valorem — two stage（fixed 1st stage, variable 2nd stage）

We believe that the fourth model is more reasonable.

1.5 On the calculation method of royalty

The formula for calculating the royalty payment for polymetallic nodule in in Appendix IV of the 《Exploitation Regulation 》（Draft）（ISBA/25/c/wp.1） is as follows：

$RP = (RMV^1 + RMV^2 + RMV^3 + \ldots. RMV) \times$ Total quantity of mineral-bearing ore（in tons）$\times$ composite royalty rate

The calculation formula for royalty payment proposed by the Chair of Briefing_Note_OEWG_13_June_2022 about financial terms at the second part of the 27th ISA session in July 2022 is：

Royalty = Applicable Royalty Rate × Aggregate Relevant Metal Value

Among them:

Aggregate Relevant Metal Value = quantity of polymetallic nodules ore (in dry tons) × grade of the related metals × official price of the related metals

We believe that the two royalty payment calculation formulas have the same principle, and both have design defects. The ore in this two formulas are valuated according to the metal or mineral in the ore rather than the raw ore. This valuation method obviously extends (or expands) the definition of the common heritage of mankind. We believe that deep-sea commercial mining harvests the raw ore on the seabed, rather than metal products or minerals, so it is reasonable to be valued

according to the raw ore. We believe that the correct formula for calculating the royalty should be:

Royalty = Weight of polymetallic nodule raw ore traded in the international seabed area (in dry tons) × Trading price of polymetallic nodule ore (per ton) × Applicable royalty rate

We believe that the reason for using the polymetallic nodule raw ore valuation and payment is:

（**1**） From the perspective of the jurisdiction of the UNCLOS and relevant laws of the ISA, we the UNCLOS stipulates that the resources in the international seabed area belong to all mankind , but the ISA only has jurisdiction over the mineral resources on the seabed, namely the primary（raw） polymetallic nodules ore collected by mining enterprises (or mining enterprises). For the polymetallic nodule ore collected by mining enterprises (or mining enterprises), the ISA has the right to charge a certain amount of royalties, and mining enterprises also have the obligation and responsibility to pay royalties to the ISA.

In the《Exploitation Regulation 》（Draft）, it is stipulated that smelting activities (except for nodule ore dehydration) in the international seabed area are prohibited to avoid the discharge of pollutants. Therefore, the pricing and charging of polymetallic nodule ore by the ISA should be based on the value of the original （raw）ore, rather than the metal (smelting product) in the ore. The smelting and processing of polymetallic nodule ore is completed by the sovereign country (or sponsor country) outside the international seabed area. If a portion of the profits of the smelting enterprises of sovereign country （or sponsor country） are also allocated to ISA, it extends （expands）the concept of the common heritage of mankind. Because smelting and processing enterprises obtain normal profits from their activities within the scope of sovereign country, and as for the part of common heritage of mankind （benefits obtained by ISA）, it has been completed through the purchase transaction of polymetallic nodule ore in the international seabed area.

In addition, it should be noted that metal smelting production not only requires the consumption of polymetallic nodules, but also other auxiliary materials (such as

coal, electricity, water, etc.), and even labor resources. The value of polymetallic nodules ore only accounts for about 20-30% of the smelting production cost, and these auxiliary materials and labor are also resources, belonging to the sovereign country （or sponsor country） where the smelting and processing enterprise is located, If the royalty is calculated and collected from the metal product end, it deprives the sovereign state （or sponsor country）of the legitimate benefits of the smelting and processing enterprise.

We can give a popular example in life to illustrate the irrationality of the existing Royalty formula of in the 《Exploitation Regulation 》(Draft). We assume that the polymetallic nodule ore harvested by mining enterprises in the international seabed area is peanuts with shells. How to calculate the royalty of peanuts with shells （equivalent to the raw ore of polymetallic nodules）， of course, is the weight of peanuts with shells （raw ore of polymetallic nodules）loaded in ship in the international seabed area multiplied by the transaction price of peanuts with shells （raw ore of polymetallic nodules）, and then multiplied by the royalty rate. If the royalty of peanut oil（the product of peanut oil processing enterprise）is adopted:

Weight of shelled peanuts × Content of peanut oil in Peanut with shell × Price of peanut oil ×Royalty rate

to calculate the royalty of peanut with shell （equivalent to polymetallic nodule raw ore）, it is obviously misleading. The peanut oil processing enterprise here is equivalent to the smelting enterprise of polymetallic nodule ore. The content of oil in peanut with shell is equivalent to the metal grade of polymetallic nodule ore, and the price of peanut oil is equivalent to the international market price of a metal in polymetallic nodule ore. We know that the price of peanut oil in the international market may be related to the price of peanut with shell, but the two kinds materials -peanut oil and peanut with shell are completely different.

According to the research report on "Valuation of Polymetallic Nodules" submitted by CRU Consulting （CRU, 2020）to the ISA, it is believed that the possible reference location for the ISA to collect royalties should be within the

international seabed scope under the jurisdiction of the ISA and also the loading location for mining enterprises (or collecting enterprises) to transfer original polymetallic nodule ore to downstream smelting and processing enterprises, That is to say, the ISA can only collect royalties from mining enterprises (or collecting enterprises), and cannot extend （or expand） to smelting enterprises. The payment of royalties is based on the transaction price and transfer quantity （measured in dry tons） of ore transactions between mining and smelting enterprises, while the transaction price of ore transactions （transfers） between mining enterprise and smelting enterprise is transparent.

（2） The pricing and charging based on the metals in the polymetallic nodule ore is obviously unreasonable compared to the pricing and charging based on the original polymetallic nodule ore, which increases the charging base and encroaches on the legitimate profits of mining enterprises.

According to the research report on "Valuation of Polymetallic Nodules" submitted by CRU Consulting （CRU, 2020） to the ISA, taking land based laterite nickel ore as an example, there is a certain similarity in nickel content between land based laterite nickel ore and nickel rich polymetallic nodule ore. The study shows that the price of laterite nickel ore with a nickel grade of 1.7% to 1.8% accounts for about 20-35% of the nickel metal price in the London Metal Market （LME）, The price of laterite nickel ore with a nickel grade of 1.4% to 1.6% accounts for approximately 15-32% of the nickel metal price in the London Metal Market（LME）.

According to the data from SMM （Shanghai Metals Market）, the FOB price of Philippine laterite nickel ore （with a nickel grade of 1.8% and a moisture content of 33%） in April 2022 was approximately $103 per wet ton. Based on the average nickel metal price of $33298 per ton in the London Metal Market （LME） in April 2022, the value of nickel metal in 1 wet ton laterite nickel ore is:

$$= 1 \times 0.67\% \times 1.8\% \times 33298 = 401.6\text{USD}$$

The calculation shows that the value of nickel metal in 1 wet ton of laterite nickel ore is 3.9 times the FOB price of 1 wet ton of laterite nickel ore. If the royalty

is charged based on the nickel metal in laterite nickel ore, it is 3.9 times the actual transaction price （FOB） of laterite nickel ore, which is obviously unreasonable, that is, it unreasonably expands the payment base.

For example, we use the comparable ore price analysis method — valuation coefficient method to estimate the transaction price of polymetallic nodule ore （cobalt rich type）in the Beijing Pioneer company ’s mining area at approximately $120-150/dry ton (unpublished paper data), while the valuation range of metals in nodule ore is approximately $850/dry ton to $1075/dry ton (OEWG, 2022), The valuation of metals in nodule ore should be at least 5.7 times the transaction price of nodule ore. If the valuation of metals in nodules is used to pay the royalty, it is 5.7 times the transaction price of the nodule raw ore, indicating that using the valuation of metals in nodules to pay the royalty is clearly unreasonable, that is, it unreasonably expands the payment base. It should be noted that the real transaction price of polymetallic nodule ore is also influenced by many factors such as mining （or collecting ）costs and the price of similar ore on land. In the future, it will gradually form in the international ore trading market competition.

（3） We adopt an ad valorem royalty payment model, where ad valorem refers to payment based on the value of the ore, which can only be generated in transactions. Pricing based on the metals in the ore only represents the theoretical value of the ore, rather than the actual transaction value. So we emphasize pricing and payment based on the transaction price of the raw ore.

1.6 The value of the applicable royalty rate

1. We believe that the purpose expressed in the 1994 《Implementation Agreement》is that the principle of establishing a payment system should treat both the contractor and the ISA fairly, and any one-sided pursuit of maximizing benefits by either party deviates from this principle; The payment rate should be set so that the mineral types from the deepsea bed have the ability of fair market competition with similar mineral types from the land.

For example, there is a certain similarity in the composition of land laterite

nickel ore and seabed nickel rich polymetallic nodules, and the smelting and processing methods of these two types of nickel bearing ores also have similarities. Indonesia is a major producer of laterite nickel ore. In 2022, the Ministry of Energy and Mineral Resources of Indonesia stipulated a royalty rate for laterite nickel ore. For laterite nickel ore. with a nickel grade below 1.5%, a royalty rate of 2% of the price will be levied. For higher nickel grade laterite nickel ore. a royalty rate of 10% of the price will be levied. The nickel grade of NORI-D's polymetallic nodule and nickel rich polymetallic nodule is generally 1.3%. Referring to the royalty value of similar grade laterite nickel ore on land, the royalty rate for the first commercial production stage of the polymetallic nodule exploitation project can be preliminarily determined as 2%.

2. We believe that it is acceptable to use the fourth payment model mentioned above （MIT model）for the royalty rate, which is a two-stage variable or progressive ad valorem royalty rate.

3. We suggest setting a royalty rate of 2% for the first commercial production stage, with a term of 5 years. the royalty rate for the second commercial production stage can be assigned based on the price range of polymetallic nodule ore transactions, but the size of the assigned value is currently uncertain; the royalty rate for the second commercial production stage can also be determined proportionally based on the transaction price of polymetallic nodule ore and the benchmark value of the royalty rate （for example, the benchmark value of the royalty rate is 2%）. In the second commercial production stage, the royalty rate is determined through negotiation between ISA and the exploitation contractor based on the price data of the polymetallic nodule ore trading market and the feasibility study of the exploitation project.

1.7 Matching of payment regime and financial model with future business models

We believe that our proposed method for calculating the royalty for polymetallic nodule mining is applicable to different business models. The expected possible

business models are as follows：

The first model is that the mining enterprise (or collecting enterprise) and its downstream smelting and processing enterprises belong to two completely independent entities. The smelting and processing enerprise directly purchases polymetallic nodule ore from mining enterprises in the international seabed area for smelting and processing. At this time, the price of polymetallic nodule ore refers to the shipping price (FOB) when a single mining enterprise engaged in mining and downstream independent smelting enterprises trade and purchase polymetallic nodule ore in the international seabed area, which is equivalent to the pit mouth price of land ore. The transaction price of polymetallic nodule ore can be recorded on the sales receipts of mining （collecting） enterprises. The price of such polymetallic nodule ore can be directly obtained by verifying sales records. For this situation, the calculation of royalty payment can be directly applied to the calculation formula related to ad valorem royalty payment.

The second model is that both the mining enterprise and the smelting enterprise belong to the same group company, and the collected polymetallic nodules are directly transferred internally to the smelting plant (enterprise) of the group company for smelting. In this case, the amount of transferred polymetallic nodule ore （calculated in dry tons） is easy to verify, but the transfer price (referring to the price of polymetallic nodule ore) is difficult to determine; For this situation, when calculating the royalty payment, the first scenario can be referred to, and the transaction price of polymetallic nodule ore with the same or similar quality can be used as the basis for calculating the royalty payment.

1.8 Determination of ore transaction prices in initial commercial mining

In the initial stages of commercial mining of polymetallic nodules, if there is no transaction price or low transaction volume of polymetallic nodule ore, the transaction price of polymetallic nodule ore can be determined by the following formula:

Transaction price of polymetallic nodular ore = relevant metal market price × grade of related metal in ore × Valuation coefficient of related metals in ore

The pricing coefficient of related metals in polymetallic nodule ore is determined by ISA through consultation with the exploitation contractor based on the market situation of the related metals.

1.9 Regulation of ore transaction price by ISA

After the gradual development and maturity of commercial mining of polymetallic nodules, ISA can formulate and release benchmark prices for the trading of polymetallic nodule ores, in order to achieve supervision and guidance on the trading prices of polymetallic nodule ores for mining enterprises. The benchmark price of polymetallic nodule ore can be obtained through netback market value method and comparable ore price method.

2. Profit sharing of transfer of exploitation contract right

2.1 We should have a complete, accurate, and profound understanding of the meaning of "profit" in the transfer of exploitation contract in international seabed area.

We believe that the transfer of exploitation contract right can generate so-called "profits", but what is the nature of "profits"? How is this"profits"'generated, what proportion does the ISA account for in this"profits", and should ISA share a portion of the "profits"? We believe that the "profits" generated from the transfer of contracts right are a kind of “bonus” or "premium".

Here are some examples：

For example, contractor A completely transfers the contract right to contractor B, and contractor B plans to buy contractor A's contract rights. A is the transferor, and B is the transferee.

The exploitation contract of contractor A has been evaluated by a third-party professional mining rights agency, and the benchmark value of the entire exploitation contract is 1 billion US dollars. Among the 1 billion US dollars, the investment in exploration and exploitation accounts for 400 million US dollars, and the proportion of resource reserves is 500 million US dollars. The first two are the rights and interests of the contractor, and another 100 million US dollars should be the “resource rent” for the "international seabed area", which can also be understood as

royalty and belongs to the rights and interests of the ISA（the maximum amount of money charged by the ISA）, But before the transfer of the contract right, it was not realized into money.

Contractor A may sell the exploitation contract through agreement or public bidding, and as a result, Contractor B buy the contract from Contractor A for $1.1 billion.

The so-called "profit" transferred from the exploitation contract is a "premium" or " bonus ", which is $100 million.

The essence of this "profit" is that before commercial exploitation, Contractor A has already sold the ore（that is nodules, for a exploitation contract of nodules） in the mining area according to the " discounted reserves" and realized the transaction value, ISA should share a portion of the "pre paid royalty " from this $100 million, and the amount of the "pre paid royalty " should be ：

$100 million × 0.1 × 3% = 300 000 US dollars （if the royalty rate = 3%），

but contractor B can request that this portion (300 000 US dollars) be deducted as "pre paid royalty " in future exploitation in the same mining area, that is, contractor B can minus 300 000 US dollars of royalty in future exploitation in the same mining area.

So, we believe that it is meaningless for ISA to share "prepaid royalties" in advance.

2.2 We believe that the transfer of exploitation rights between contractors will not reduce the total royalties obtained by ISA in the same mining area.

The total ISA royalties in a mining area basically depends on the total reserves （or production） of the mining area, and the transfer of contract right does not change the total reserves（or production） in the same mining area. For the exploitation in a same mining area, through the transfer of exploitation contract right or equity transaction and other market competition behaviors, the total reserve of the mining area become more accurate, the total production of the mining area become more accurate, and the total ISA royalties in the same mining area will not be reduced.

Here are some examples：

Suppose a contractor “A”has a 30-year polymetallic nodules exploitation contract in a mining area in the International Seabed area, with a planned total

production of 200 million tonnes of dry nodules over 30 years, with a sales price of US $100 / dry ton of nodules (raw) ore (assumed to remain unchanged for 30 years) and a royalty rate of 3% (assumed to remain unchanged for 30 years).The total amount of royalties acquired by the ISA over the life term of the 30-year exploitation contract is US $600 million.

Assume that Contractor A has carried out commercial production for 5 years after being awarded a 30-year exploitation contract, has produced a total of 20 million tonnes of dry nodules over 5 years and has paid the ISA royalty of $60 million. Subsequently, contractor “A” transfer the exploitation contract (exploitation rights) to Contractor “B” for various reasons. Contractor “B” continues to complete the commercial production of this mine area after purchasing the exploitation contract of Contractor A for a period of 30 years. The amount of residual nodules produced in this mining area is 180 million tons of dry nodules. Assuming the sales price of the nodule(raw ore) is $100 / dry ton (assuming it remains unchanged for 30 years) and the royalty rate is 3% (assuming it remains unchanged for 30 years), Contractor “B”'s royalty payment to ISA is $540 million, ISA's total royalty revenue from this mining area, which is the sum of the royalties paid by Contractor A and Contractor B, remains at $600 million.

Therefore, the transfer of exploitation contracts between different contrators within a same mine area, maintaining the commercial production of the nodules, will not result in the loss of the total revenue of royalties paid to ISA in this mining area as long as the total amount of mineral products (or raw ore) sold in this mining area remains the same.

2.3 We fully support the viewpoint in the document dated February 2023，“ISA Contractor Submission Responding to the African Group Submissions”，That is “The value of nodules removed from the international seabed area as the most appropriate basis for the calculation of ISA royalties”. In the above discussion, we make a further extension to this viewpoint.

2.4 We believe that in the early stage of deep-sea commercial mining industry, the contractors can promote the rational allocation and optimization of market resources through the transfer of exploitation contracts （mining rights）, restructuring, equity transaction and so on, which is conducive to the birth and development of deep-sea mining. At the initial stage of deep-sea mining, ISA should consider attracting venture capital to speed up the exploitation of deep-sea mineral resources, rather than

charging unreasonable taxes and fees to increase the financial burden of contractors.

3. Suggestions for the next step of work

3.1. Research on the estimation of resource rent for polymetallic nodule exploitation project

Guided by the United Nations SEEA—Central Framework，conducting research on the estimation of resource rent for polymetallic nodule exploitation project, because the maximum amount that the ISA can charge for polymetallic nodule exploitation project is the resource rent for the entire mining area, this research work can define the maximum amount money of right and interest of the ISA.

3.2 Research on the estimation of transaction prices for polymetallic Nodule Ores

Using netback market value method, comparable ore price method, etc，conduct research on benchmark price estimation for polymetallic nodule ore transactions.

Inter-sessional Meeting on ISA Payment Regime: Equalization Measures

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1. Payment regime and financial model of polymetallic nodule exploitation project

● **We should have a complete, accurate and profound understanding of the meaning of royalty collected by ISA. We believe that the best and legal way for ISA to obtain income （or revenue） is through royalty.**

In the international seabed area, the royalty is the rent collected by the ISA for the transfer of mineral resources assets in the international seabed area. The maximum amount of money that the ISA can charge for a exploitation contract is the resource rent of the entire mining area.

- **Theoretical basis of royalty : resource rent**
- **Royalty： is a charging method for obtaining resource rent**

★ **What are the rights and interests of the ISA in the international seabed area?**

Can the rights and interests of the ISA be estimated in monetary terms?

Our answer is yes，

We can use the mineral resource rent of the entire mining area of the exploitation project (or exploitation contract) to represent the interest and right of the ISA.

★ **The estimation method for mineral resource rent is represented by the following formula:**

Mineral resource rent = Sales revenue of mineral products — Total cost of mineral products — Normal return on mining investment

The discounted cash flow statement estimation method is used

from United Nations 《System of Environmental-Economic Accounting 2012-Central Framework》（SEEA-Central Framework）

• **Mineral resource rent**

The value of mineral resources in their natural state.

Interests belonging to the ISA，represent the maximum value of royalty

• **Sales revenue from mineral products:**

The market sales revenue from the manufacture of mineral resources into mineral products.

• **Total cost of mineral products:**

including investment costs, exploration costs, operating costs, and various government taxes and fees (including corporate income tax, but excluding resource fees such as royalties) for manufacturing mineral resources into mineral products.

• **Normal return on mining investment:**

= （100% — The Average Effective Tax Rate ）× profit

The return that mining rights holders should receive when investing in exploitation. Interests belonging to the contractor

★ Royalty

The United Nations regards royalty as rent for mineral resources rather than taxes. Royalties are the benefits that a country should receive based on its status as an owner of mineral resources, In the international seabed area， country is replaced by ISA. This "mineral resource" specifically refers to mineral resources in their original natural state, rather than discovered and explored by investors, such as the amount of mineral resources, mineral reserves, etc.（SEEA-Central Framework）

- **In the practice of mineral resource management in various countries, the Royalties is rent, but the Royalties usually charged is less than the resource rent. The determination of royalties rates has strong policy implications.**

- **The rate and levy of royalty differs from country to country, there are four main forms.**

AD valorem royalties are calculated by:

$$R = k \times Pv \times Q = k \times W$$

R is the royalty of mineral products sold during the payment period,

k is the royalty rate (%),

Pv is the price of a unit mineral product

Q is the quantity of mineral products sold during the payment period, and

W is the sales revenue of mineral products

- **Mineral products refer to raw ore in this paper**
- **AD valorem royalty can make the amount of royalty charged fluctuate with the price, which is is adopted by most countries.**
- **The MIT mode provides four optional payment models, We believe that the fourth model is more reasonable.**

（fixed 1st stage, variable 2nd stage）

- **Royalties reflect the economic benefits of mineral resources being owned by the country（In the international seabed area, the country is replaced by the ISA）.**
- **Whether in accordance with the United Nations《SEEA—Central Framework》or in accordance with the mining laws of various countries, royalties are collected after the ore is mined, processed, and sold.**
- **Some countries' mining laws refer to them as "production royalties" to represent the fees collected after production.**

● **Principles for designing payment regime and financial model for polymetallic nodules exploitation project in the international seabed area**

★ **The principle of the common heritage of mankind**

★ **Principle of balance of interests**

★ **Principle of operability**

★ **Principle of transparency**

The use of open market ore transaction price and ore transaction volume to calculate royalty, to achieve openness and transparency.

The transaction price refers to the price of the original （raw） ore of polymetallic nodules.

● **We believe that the purpose expressed in the 1994《Implementation Agreement》is that the principle of establishing a payment system should treat both the contractor and the ISA fairly, and any one-sided pursuit of maximizing benefits by either party deviates from this principle.**

★ **The MIT model adopts a cash flow method to design a payment regime with the goal of maximizing the return obtained by ISA.**

★ **The African Group attempt to maximize profit sharing of ISA.**

Whether it is deviates from this principle " trentment of fairness between ISA and contrctor" ?

● **We believe that the correct formula for calculating the royalty should be:**

Royalty = Weight of polymetallic nodule raw ore traded in the international seabed area (in dry tons)

× transaction price of polymetallic nodule raw ore (per ton)

× Applicable royalty rate

Previous formulas expressed in Appendix IV of the 《Exploitation Regulation》（Draft）and Briefing_Note_OEWG_13_June_2022 have design defects.

The ore in this two formulas are valuated according to the metal or mineral in the ore rather than the raw ore.

● **We believe that the reason for using the polymetallic nodule raw ore valuation and payment is:**

★ **From the perspective of the jurisdiction of the UNCLOS ,the ISA only has jurisdiction over the mineral resources on the seabed, namely the original （raw） polymetallic nodules ore collected by collecting enterprises (or mining enterprises), The smelting and processing of polymetallic nodule ore is completed by the sovereign country (or sponsor country) outside the international seabed area.**

If a portion of the profits of the smelting enterprises of sovereign country （or sponsor country） are also allocated to ISA, it extends （expands） the concept of the common heritage of mankind（or ISA′s interests ）.

★ In the《Exploitation Regulation 》（Draft）, it is stipulated that smelting activities (except for nodule ore dehydration) in the international seabed area are prohibited to avoid the discharge of pollutants.

Therefore, the pricing and charging of polymetallic nodule ore by the ISA should be based on the value of the original （raw）ore, rather than the metal (smelting product) in the ore.

★ The pricing and charging based on the metals in the polymetallic nodule ore is obviously unreasonable compared to the pricing and charging based on the original polymetallic nodule ore, which increases the charging base and encroaches on the legitimate profits of mining enterprises.

For example,

we use the comparable ore price analysis method — valuation coefficient method to estimate the transaction price of polymetallic nodule ore （cobalt rich type）in the Beijing Pioneer company’s mining area at approximately $120-150/dry ton (unpublished paper data), while the valuation range of metals in nodule ore is approximately $850/dry ton to $1075/dry ton (OEWG, 2022), The valuation of metals in nodule ore should be at least 5.7 times the transaction price of nodule ore.

If the valuation of metals in nodules is used to pay the royalty, it is 5.7 times the transaction price of the nodule raw ore, indicating that using the valuation of metals in nodules to pay the royalty is clearly unreasonable, that is, it unreasonably expands the payment base.

● **The value of the applicable royalty rate**

The payment rate should be set so that the mineral types from the deepsea bed have the ability of fair market competition with similar mineral types from the land.

For example, there is a certain similarity in the composition of land laterite nickel ore and seabed nickel rich polymetallic nodules.

We can imagine that when nickel rich polymetallic nodules from the seafloor enter the industrial chain of land nickel mines, there will be a competitive or complementary relationship between nickel rich polymetallic nodules ore and land laterite nickel ore.

Indonesia is a major producer of laterite nickel ore. In 2022, the Ministry of Energy and Mineral Resources of Indonesia stipulated a royalty rate for laterite nickel ore. For laterite nickel ore. with a nickel grade below 1.5%, a royalty rate of 2% of the price will be levied. For higher nickel grade laterite nickel ore. a royalty rate of 10% of the price will be levied.

The nickel grade of NORI-D's polymetallic nodule and nickel rich polymetallic nodule is generally 1.3%.

Referring to the royalty value of similar grade laterite nickel ore on land, the royalty rate for the first commercial production stage of the polymetallic nodule exploitation project can be preliminarily determined as 2%.

Alternatively, we can use the weighted average of the royalty rate based on production in different laterite nickel producing countries as the royalty rate for the first 5-year commercial production stage of the polymetallic nodule project.

● Matching of payment regime and financial model with future business models

The first model is that the mining enterprise (or collecting enterprise) and its downstream smelting and processing enterprises belong to two completely independent entities.

The smelting and processing enerprise directly purchases polymetallic nodule ore from mining enterprises in the international seabed area for smelting and processing. At this time, the price of polymetallic nodule ore refers to the shipping price (FOB) when a single mining enterprise engaged in mining and downstream independent smelting enterprises trade and purchase polymetallic nodule ore in the international seabed area, which is equivalent to the pit mouth price of land ore.

The transaction price of polymetallic nodule ore can be recorded on the sales receipts of mining （collecting） enterprises. The price of such polymetallic nodule ore can be directly obtained by verifying sales records.

● Determination of ore transaction prices in initial commercial mining

In the initial stages of commercial mining of polymetallic nodules, if there is no transaction price or low transaction volume of polymetallic nodule ore, the transaction price of polymetallic nodule ore can be determined by the following formula:

Transaction price of polymetallic nodular ore

= relevant metal market price × grade of related metal in ore

× Valuation coefficient of related metals in ore

● Regulation of ore transaction price by ISA

After the gradual development and maturity of commercial mining of polymetallic nodules, ISA can formulate and release benchmark prices for the trading of polymetallic nodule ores, in order to achieve supervision and guidance on the trading prices of polymetallic nodule ores for mining enterprises.

The benchmark price of polymetallic nodule ore can be obtained through netback market value method and comparable ore price method.

2. Profit sharing of transfer of exploitation contract right

- **We should have a complete, accurate, and profound understanding of the meaning of "profit" in the transfer of exploitation contract in international seabed area.**

We believe that the "profits" generated from the transfer of contracts right are a kind of “bonus” or "premium".

For example, contractor A completely transfers the contract right to contractor B, and contractor B plans to buy contractor A's contract rights.

The exploitation contract of contractor A has been evaluated by a third-party professional mining rights agency, and the benchmark value of the entire exploitation contract is 1 billion US dollars. Among the 1 billion US dollars, the investment in exploration and exploitation accounts for 400 million US dollars, and the proportion of resource reserves is 500 million US dollars.

The first two are the rights and interests of the contractor, and another 100 million US dollars should be the “resource rent” for the "international seabed area", which can also be understood as royalty and belongs to the rights and interests of the ISA（the maximum amount of money charged by the ISA）, But before the transfer of the contract right, it was not realized into money.

Contractor A may sell the exploitation contract through agreement or public bidding, and as a result, Contractor B buy the contract from Contractor A for $1.1 billion.

The so-called "profit" transferred from the exploitation contract is a "premium" or " bonus ", which is $100 million.

The essence of this "profit" is that before commercial exploitation, Contractor A has already sold the ore（that is nodules, for a exploitation contract of nodules） in the mining area according to the " discounted reserves" and realized the transaction value, ISA should share a portion of the "pre paid royalty " from this $100 million, and the amount of the "pre paid royalty " should be：

$100 million × 0.1 × 3% = 300 000 US dollars

（if the royalty rate = 3%），

but contractor B can request that this portion (300 000 US dollars) be deducted as "pre paid royalty " in future exploitation in the same mining area, that is, contractor B can minus 300 000 US dollars of royalty in future exploitation in the same mining area.

So, we believe that it is meaningless for ISA to share "prepaid royalties" in advance.

● **We believe that the transfer of exploitation rights between contractors will not reduce the total royalties obtained by ISA in the same mining area.**

The total ISA royalties in a mining area basically depends on the total reserves （or production） of the mining area, and the transfer of contract right does not change the total reserves（or production） in the same mining area. Here are some examples：

Suppose a contractor “A”has a 30-year polymetallic nodules exploitation contract in a mining area in the International Seabed area, with a planned total production of 200 million tonnes of dry nodules over 30 years, with a sales price of US $100 / dry ton of nodules (raw) ore (assumed to remain unchanged for 30 years) and a royalty rate of 3% (assumed to remain unchanged for 30 years).

The total amount of royalties acquired by the ISA over the life term of the 30-year exploitation contract is US $600 million.

Assume that Contractor A has carried out commercial production for 5 years after being awarded a 30-year exploitation contract, has produced a total of 20 million tonnes of dry nodules over 5 years and has paid the ISA royalty of $60 million.

Subsequently, contractor “A” transfer the exploitation contract (exploitation rights) to Contractor “B” for various reasons. Contractor “B” continues to complete the commercial production of this mine area after purchasing the exploitation contract of Contractor A for a period of 30 years.

The amount of residual nodules produced in this mining area is 180 million tons of dry nodules. Assuming the sales price of the nodule(raw ore) is $100 / dry ton (assuming it remains unchanged for 30 years) and the royalty rate is 3% (assuming it remains unchanged for 30 years), Contractor “B”'s royalty payment to ISA is $540 million, ISA's total royalty revenue from this mining area, which is the sum of the royalties paid by Contractor A and Contractor B, remains at $600 million.

● **We believe that in the early stage of deep-sea commercial mining industry, the contractors can promote the rational allocation and optimization of market resources through the transfer of exploitation contracts （mining rights）, restructuring, equity transaction and so on, which is conducive to the birth and development of deep-sea mining.**

At the initial stage of deep-sea mining, ISA should consider attracting venture capital to speed up the exploitation of deep-sea mineral resources, rather than charging unreasonable taxes and fees to increase the financial burden of contractors.

3. Suggestions for the next step of work

● **Research on the estimation of resource rent for polymetallic nodule exploitation project**

Guided by the United Nations SEEA-Central Framework，conducting research on the estimation of resource rent for polymetallic nodule exploitation project, because the maximum amount that the ISA can charge for polymetallic nodule exploitation project is the resource rent for the entire mining area, this research work can define the maximum amount money of right and interest of the ISA.

● **Research on the estimation of transaction prices for polymetallic Nodule Ores**

Using netback market value method, comparable ore price method, etc，conduct research on benchmark price estimation for polymetallic nodule ore transactions.

Thank you for attention