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Intervention made by

the Delegation of the Republic of Indonesia

on the Agenda Item 6a : Matters relating to the definition and delimitation of outer space

at the 60th Session of Legal Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space

Vienna, 31 May – 11 June 2021

Thank you Madam Chair,

Indonesia appraises the work that has been done by Secretariat and welcome historical summary on the consideration of the question on the definition and delimitation of outer space, as contained in document A/AC.105/769/Add.1.

In this opportunity Indonesia would like to inform the Secretariat that Indonesia has submitted the responds on National legislation and practice relating definition and delimitation of outer space as contained in document A/AC.105/C.2/2017/CRP.31. In this regard, Indonesia proposes to add Indonesia responds to the document A/AC.105/769/Add.1.

Madam Chair,

As we stated on many occasions in the past, my delegation would like to reiterate that the issue of the definition and delimitation of outer space is important for Indonesia. Therefore, we encourage UNCOPUOS to facilitate deliberation among member states on this issue as a legal basis for State in exercising its sovereignty over the air space and conduct activities in outer space. It is my delegation's view that the issue of definition and delimitation of outer space is closely linked to matters of safety and security.

In this context, Indonesia has already set out the delimitation of outer space under Law Number 21 of 2013. In Article 1 of the Elucidation of Law No. 21 of 2013, we define outer space as an area including its contents that is beyond and surrounds the atmosphere of the Earth.

Indonesia's considerations in determining the delimitation of outer space at between 100 to 110 kilometers above sea level are based on comprehensive aspects, including the scientific, technical, and physical characteristic, namely the following: the atmospheric layers, aircraft altitude capacity, the perigee of spacecrafts, and the Karman Line.

First, atmospheric layers. It is commonly known that Earth's atmosphere comprises various layers with different heights and characteristics. One of

the layers is homosphere with altitude of 80 kilometers above sea level. At this height, the chemical elements are still stable enough to support aircraft engine operations.

The second consideration is aircraft altitude capacity. Based on the 1944 Chicago Convention, an aircraft is "any machine which can derive support from the reaction of the air other than the reaction of the surface of the earth". It becomes clear that aircraft rely heavily on the existence and aerodynamic support from the air which exist up to the altitude of 60-80 kilometers. Based on Sanger's Diagram, the ability to fly an aircraft is related to the engine it uses and the aerodynamic lift. Aircraft that use propeller engines can only operate up to an altitude of 8 kilometers and aircraft that use turbine engines can operate up to 60 kilometers. Aerodynamic support is estimated to reach up to between 60-80 kilometers. Currently, UAV with the C4ISR capability can fly up to the altitude of around 330 thousand feet or around 110 km above the sea level. Thus, it can be concluded that the highest altitude an aircraft can reach with existing technology is already at a maximum.

The third consideration is the perigee for spacecraft. Generally, the perigee of a satellite's orbit is between 80 - 120 kilometers above Earth's surface. It can be concluded that space begins from this altitude. Based on this theory, the lowest point of outer space can be considered to be 100 or 110 kilometers above sea level. Experts supporting this theory have defined outer space as "space surrounding the earth where objects can move in at least a full orbit without artificial propulsion system according to the laws of celestial mechanics without being prevented from doing so by the functional resistance of the earth's atmosphere. It extends from an altitude of approximately 100 km upwards". It has been proven when the aircraft X-15 was in free fall from an altitude of about 100 kilometers. Above this point, aerodynamic lift was not present and astrodynamics functioned physically.

The fourth consideration is Von Karman's Line Theory. According to this theory, the lowest point of outer space is based on the change in aerodynamic reactions of an aircraft. Due to the decrease in air density, the aerodynamic force at a higher point will also decrease. At a certain altitude, this force will be replaced with a centrifugal force, also known as

the Kepler force. Based on this theory, the lowest altitude of outer space is established at 100 kilometers.

Madam Chair,

We would like to conclude by reiterating the importance of the issues of the definition and delimitation of outer space. We hope that agenda item on the definition and delimitation of outer space will be kept in the upcoming Legal Subcommittee of 2022.

Thank you.