

Missile Defense and International Law

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Abstract

Some countries such as U.S.A., Russia, Israel, European countries, Japan now study and/or develop missile defense systems against ballistic missiles from other countries including so called rogue countries. Though there is legitimacy for such missile defense by the right of self-defense as well as the doctrine of military objectives, there will happen an unhelpful result, hazardous outer space with debris. This is a kind of dilemma. We have to understand this reality and establish appropriate legal and technical measures to avoid this unacceptable situation.

1. Development of Missile Defense Systems

1) Proliferation of Ballistic Missiles

The number of states holding ballistic missiles is increasing rapidly after the end of Cold War structure. Only the superpowers had ballistic missile technology at the earlier stage of the Cold War era. For example, according to "Military Balance" etc., those countries that deployed ballistic missiles in 1969 were only U.S.A. and U.S.S.R., but they increased in number to 15 nations in 1989 when the Cold War ended. At that time, those new countries were West European countries, such as France, the United Kingdom, West Germany, Italy, etc., East European countries, such as Bulgaria, East Germany, Hungary, Poland, and China in Asia, etc. Now 46 nations possess ballistic missiles in 2002 after one decade passed. Many countries of Africa, Middle East, South America and Asia came to have their ballistic missiles¹. In those countries, when the political situation is unstable, ballistic missiles might be actually used. In such cases, this situation becomes an unstable factor in that region. Furthermore, the danger that missiles will be transferred to terrorist groups from such states is also concerned.

2) Missile Defense Systems

Based on such a situation, some advanced nations are developing the defense system against ballistic missiles. Some of those are Arrow system developed by Israel, S300/S400 of Russia, MEADS (Medium Extended Air Defense System) developed by West European countries with U.S.A. Actually the systems of Israel and Russia are already in service. Moreover, U.S.A. also develops and builds their missile defense systems now. If those defense systems are completed, the threat of missiles from the so-called rogue states will be minimized.

However, these defense systems will not be available by all nations. The missile defense systems are combined to various technical elements, such as detection of missiles, identification of targets, interception, its evaluation, and further detection of the following missiles. Huge finance as well as high technological skills is required for development and introduction. Systems can be equipped only in advanced countries' areas, such as U.S.A., Russia, Europe and Japan. Consequently, there will emerge two country groups in the world, the countries with missile defense capability, and countries without missile defense capability. That means that the world will be divided into two areas, the area protected from ballistic missiles, and the area not protected.

2. Applicability of International Law to Missile Defense Systems

1) Area of Interception

Because the targets (ballistic missiles) pass through outer space, the interception is done there. Therefore, the problem of the relationship between the international space law and missile interception is raised.

2) Principles applied to Missile Defense in Outer Space

a) Self-Defense

Generally the international space law including Outer Space Treaty

regulates the activities of states in outer space. These space related treaties have declared that international law is applied to outer space activities. For example, Article 3 of Outer Space Treaty provides that international law is applied for activities there². In that drafting process, it was interpreted that international law included use of the right of self-defense³. Of course, international law does not accept the act of aggression on the Earth, and also is the same in the outer space. Moreover, general international law forbids use of weapons of mass destruction, and also is the same in outer space. Outer Space Treaty forbids strictly carrying weapons of mass destruction on the earth orbit by Article 4. However, as mentioned above, use of the right of self-defense is not forbidden.

How is international law applied to the missile defense systems? First, when missile defense systems are functioned as execution of the right of self-defense, there is clearly a legal basis. By Article 51 of the U.N. Charter⁴, when one country is attacked from other countries, she can counterattack the aggressor countries using the right of self-defense. It is natural that this principle is applied also to the activities in outer space.

However, in fact, can the right of self-defense allow all activities? This question should be considered based upon the following reason. In the Cold War era, the use of the right of self-defense to the ICBMs in outer space was a prologue to the full-scale nuclear war between the East and the West. In this case, the right of self-defense directly linked to destruction of the whole Earth, and human beings, though the interception marked a good score. But in that era, the countries with the missile defense capability were only U.S.A. and U.S.S.R. As long as both two countries took a restraint attitude on missile attacks, the conditions could be managed effectively.

On the other hand, while the country with missile defense capability is still limited, the countries holding ballistic missiles are increasing in number. Furthermore, because so-called rogue states are included among those,

the possibilities of missile attacks from them are not a nominal situation, but a certain imaginable situation. We have to consider such worst cases of the real war between the advanced countries with missile defense capability and the rogue states.

In those circumstances, sufficient examination is required about what role international law plays about the missile defense as a real imaginable situation.

b) Doctrine of Military Objectives

The missile defense systems, which are interception systems actually used, are ultimate defense systems in a sense. In the modern law of conflict, the targets are restricted to the military objectives in order to avoid unnecessary damage to the non-combatants, ordinary people. Missile defense destroys pinpoint the missile, which flies in outer space. This defense technology just suits the doctrine of military objectives most in that only the military targets are destroyed correctly. Therefore, the influence of the interception will not be supposed to damage others other than belligerents.

However, because of the physical characteristic of outer space, there will happen the different result. The destroyed missile warheads and the interceptor missiles themselves will turn many pieces of debris, and fly like a shower in outer space. Probably, most of such debris fall down toward the earth atmosphere, as shooting stars, and are burned out. On the other hand, some debris might stay on the earth orbit. For the satellites passing through such a debris shower, without any armour on them, space debris on the orbit and/or in outer space are fatal weapon fundamentally. The result by which many warheads were destroyed by the ultimate missile defense system might be such orbital space with debris.

3. After Missile Defense

1) Number of Space Debris Caused by Missile Defense

In the present technology of missile defense, the attainment altitude of interceptor missiles is about 100 to 200km. This altitude now does not have so many debris and at this altitude, target

(ballistic missile) is passing through in the boost phase (upward) and the terminal phase (downward). Even if debris occur, it is thought that they may not stay at outer space for a long time. However, a certain amount of debris might stay on the low earth orbit. Moreover, when missile defense technologies, such as space-based missiles as well as land-based interceptors, which go up to higher altitude, are developed in the future, the altitude of interception will rise higher. In such cases, mid-course interception against the warheads will be emerged. The mid-course altitude of ballistic missile warheads reaches almost 1,000km. If we examine some ASAT experiments, one space object will be ruined into hundreds of debris. In the experiment in 1968 by U.S.S.R., a suicide explosive satellite broke up into 100 or more debris⁵. In another experiment in 1985 by U.S.A., a targeted satellite was destroyed into near 300 debris by the collision with an air-launched missile⁶. What missile defense aims as a target is not an artificial satellite but a missile, which passes outer space with a hard nose cone. And the speed is less than the first astronautics velocity (7.9km/s), because this is not a satellite but a ballistic trajectory object. Therefore, it is unknown what number of debris on the orbit will be made from a missile warhead. To be debris on the orbit, such objects need to increase their own speed to the first astronautics velocity or more by the explosion. However, on the other hand, because the number of targeted warheads does not seem single but more, we can imagine the danger of flying some hundred of debris on the orbit. And of course, we can imagine the same danger as on the low earth orbit mentioned above. In this case, the debris shower will fall down not from 100 or 200 km high but from 1,000 km high.

2) Kessler Syndrome on the Low Earth Orbit

Such a situation reminds us of Kessler syndrome. In the present analysis, the outer space around the altitude of 1,000km is already in saturation. It is

concerned that the space objects there might collide with existing debris, turn new debris, and hit new space objects again. If missile interception is done on such an orbit, the saturated condition will be severer. This is Kessler Syndrome⁷.

The problem in this case is that the outbreak of those debris and the risk of Kessler syndrome are the results of legitimate activities under international space law, which was done against an illegal act like aggression. After doing the right action, the result might become a disincentive factor to all space actors in future.

We here face the special conditions from the characteristic of outer space. In outer space, there is not the same kind of natural resilience as on the Earth like weathering or diffusion.

How should we evaluate such a result by missile defense? The legitimate activities cannot be suspended even if they cause the obstacle for future space utilization. This problem reminds us of the advisory opinion of the International Court of Justice (ICJ) about the use of nuclear weapons in 1996, judges could not decide the legitimacy of such use when the existence of states is at stake⁸. Although ENMOD (Prohibition of Environmental Modification) treaty⁹ forbids environmental change of the outer space, it cannot be interpreted forbidding the right of self-defense. ICJ judged in the advisory opinion in 1986 that environmental treaty's obligation could not limit the right of self-defense under international law¹⁰. Making nothing to the ballistic missiles passing through outer space means only waiting the damage by missiles on the Earth. That is an unacceptable situation for such countries with adequate missile defense capability. On the other hand, polluted low earth orbit in outer space is also not unacceptable for all the space users of the world.

Of course, for the attacked state, it is theoretically possible to ask for war indemnity from the aggressor state, which performed the illegal activities (attacks by ballistic missiles). And also, the third party states being outside the dispute may claim the international liability for the

damage, which they have by such illegal activities according to the international law of war. However, it seems difficult for rogue countries to compensate all damage in outer space. And if we have good finance for cleaning outer space, there still be another problem. We have no concrete measure for orbit cleaning at present. Therefore, we are now far from ideal solution on this problem. In missile interception in outer space, this factor might be one of the surrounding problems, but not so small.

4. Future Consideration

1) Opportunism and Reality

We can see a certain situation of international society from the viewpoint of proliferation of ballistic missiles and development of missile defense technologies as its countermeasure. In this situation, we can see a kind of optimism and pessimistic facts, which deny such optimism. There seems optimism in legal sense as well as in technological sense, where the necessity and legitimacy of missile defense are accepted, and further we want to believe that the result from legitimate missile interception must not be any obstruction for our future utilization of outer space. However, we will face a thorny result, outer space with debris shower falls and debris on the low earth orbit. Probably, international law including space law, as well as the law of armed conflict have to be interpreted appropriately in future in consideration of technology and reality.

2) Temporary Conclusion

A specific conclusion cannot be drawn at the time of this analysis. What should be considered at present will be summarized to the following several points.

- a) Fully understand the physical characteristic of space anew with scientists as well as engineers.
- b) Develop immediately the debris cleaning technology on the international level.
- c) Build new appropriate logic for defense of the international society as a whole, not only for defense of one country. Upon this new logic, it may be justified

that the whole international society shares the burden for the space cleaning after missile interception.

- d) Advance further effort towards the peace and security on the Earth. It might be the best solution for continuing our space utilization. If nobody wants to launch the ballistic missiles, we can keep the outer space quiet and calm.

After all, the temporary conclusion is likely to become a very simple thesis. That is, no peace of outer space without peace on the Earth.

*Any opinion here is the personal opinion of the author, not the opinion of any organization, which the author belongs.

¹ *Military Balance 1970-1971, Military Balance 1988-1989, Military Balance 2001-2002*, etc.

² Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, 1967.

³ M.S.McDougal, H.D.Laswell & I.A.Vlasic, *Law and Public Order in Outer Space*, Yale University Press, 1963, p.441.

⁴ Charter of The United Nations, 1945.

⁵ In this test, ASAT (Kosmos249) and the target (Kosmos248) were broken down into 110 debris. And after 10 days, new ASAT (Kosmos252) made 139 debris.

⁶ In this test, the United States used an air-launched missile from F-15. The target, Solwind of P-78 on the 500 km high orbit, was hit and destroyed into 287 debris.

⁷ YASAKA, Tetsuo, *UCHU NO GOMI MONDAI -Space Debris* (in Japanese), Shokabou, 1997, pp.88-90.

⁸ Legality of the Use by a State of Nuclear Weapon in Armed Conflict, Advisory Opinion, No.96/22, 1996, para.97.

⁹ Convention on the Prohibition of Military of Any Other Hostile Use of Environmental Modification Techniques, 1978.

¹⁰ Advisory Opinion (note 8), para.30.