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**Abstract**

In the post Cold War era, we are facing a number of regional and local disputes. For supporting the settlement of such disputes, the proposal of International Satellite Monitoring Agency (ISMA) in 1978, which was not accepted at that time, should be review and revive in a new style. This renewal ISMA will use not only the military reconnaissance satellites but also civil remote sensing satellites to maintain international peace and security. We have to start the feasibility study of new ISMA in its technical and legal matters internationally.

**Introduction**

The collapse of "Berlin wall" in 1989, and following drastic changes in the east European states and the disbandment of U.S.S.R. have made the Cold War era end.

In the Cold War era, modern international law played an important role not to happen the hot war by prohibiting the use of force except in the case of self-defense. In fact, however, peace was kept ironically by the military confrontation between the east led by U.S.S.R. and the west led by U.S.A. Sometimes U.S.S.R. and U.S.A. have intentionally tensed the regional disputes and ceased them. Because the disbandment of U.S.S.R., who was an important player of the east-west relations, means the end of the above-mentioned Cold War structure, the world now falls into an serious situation where no one may control the regional military disputes.

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**Increase in Regional Disputes**

Under these circumstances, the United Nations (UN) have strengthened the function of Peace Keeping Operations. After the first PKO mission (UNTSO in Middle East) in 1948, UN has held 34 missions as of 1994. If we devide these 34 PKO missions before and after 1989 when the Cold War era ended, there were 15 missions for 41 years from 1948 to 1988 and 19 missons for only 6 years from 1989 to 1994. These numbers clearly show the drastic increase in disputes after the Cold War era and the heavier responsibility of UN.

**New Structure for the Post Cold War  
- Confidence Building Measures -**

Now is the time to make a new structure and try to maintain the world order. In this paper, the verification system from outer space in relation to the confidence building measures will be examined.

**Confidence Building Measures**

Confidence building measures are established in some regional organizations including Europe, Asia and so on. This measures aim to lessen the possibility of disputes and the tension through emphasizing the peace by cooperation rather than the peace by competition. More specifically, after the release of military information which was once kept in secret, the both sides show no intention of armed attack, accept mutual verification to achieve the whole confidence and security condition. This kind of confidence has been established by various ways. The advance notice of military manoeuvres, acceptance of foreign personnels (inspectors) to such manoeuvres, and human exchange programs including those of scholars are all beneficial to confidence building.

## Open Skies Treaty

One of the appropriate example of confidence building measures is the Open Skies Treaty in 1992.<sup>(1)</sup> This treaty sets confidence building measures of the member states including NATO members and former Warsaw Pact members in the framework of Conference on Security and Co-operation in Europe (CSCE). Its purpose is to improve openness and transparency of members' military activities, to facilitate the monitoring of compliance with existing or future arms control agreements and to strengthen the capacity for conflict prevention and crisis management through the mutual aerial observation of all the territories of members. Any member state can fly over all the territories of other members and make an observation flight on condition that she makes the prior notice no less than 72 hours.<sup>(2)</sup> Though this treaty has not gone into effect yet, this open skies regime should be evaluated as progress because it is thought as a limitation to the strong sovereignty to territorial air space.

## Confidence Building Measures through Outer Space

On the other hand, how do we use outer space which is more suitable for confidence building measures through observation?

Outer space has been recognized as an open space which "is not subject to national appropriation by claim of sovereignty, by means of use or occupation or any other means."<sup>(3)</sup> And though most of satellites in orbit (except a Geostationally Orbit etc.) fly over various territories and areas of the world, no flight has received effective protests from the states concerned. Therefore, we can say that, both *de jure* and *de facto*, launching observation satellites in orbit is not prohibited.

These interpretation and practice are also backed up by the arms control negotiations between U.S.A. and U.S.S.R. Two states, through the talks for the limitation of strategic arms, set the verification systems in order to verify the reduction of arms, which included the verification from outer space. They provided that the verification should be done by "national technical means (NTM)" in the ABM Treaty<sup>(4)</sup>, the SALT I Interim Agreement in 1972<sup>(5)</sup> and the SALT II Treaty in 1979.<sup>(6)</sup> This NTM was

considered the verification by satellites by both parties. The NTM clause was article 12 of the ABM Treaty, article 5 of the SALT I Interim Agreement and article 15 of the SALT II Treaty. These verification provisions are almost the same, for example in the ABM Treaty of 1972, "For the purpose of providing assurance of compliance with this Treaty, each Party shall use national technical means of verification at its disposal in a manner consistent with generally recognized principles of international law." Considering these verification clauses in these treaties, both states believed that the observation satellites had enough technical capability in order to verify the ABM weapons, strategic arms including the bombers and missiles whose numbers were limited by these treaties. This historical development shows us that at least U.S.A. and U.S.S.R. have recognized the observation from space as a confidence building measure from 1972.

## International Satellite Monitoring Agency

Apart from U.S.A. and U.S.S.R., some states have argued international confidence building regimes using outer space. The International Satellite Monitoring Agency (ISMA) which was proposed in 1978 by France was a example of these proposals.<sup>(7)</sup> This ISMA proposal by France was very short, consisted of only 6 parts. However, there was much implication in it. The purpose of ISMA is to advance disarmament efforts and the strengthening of international security and confidence.<sup>(8)</sup> The functions of ISMA includes participation in monitoring the implementation of international disarmament and security agreements and in the investigation of a specific situation which seems to be in danger.<sup>(9)</sup> For those purposes and functions, ISMA would have a centre for processing data (in Stage 1), would establish data-receiving stations (in Stage 2), and lastly (in Stage 3) ISMA itself would have the observation satellites required for the performance of its task.<sup>(10)</sup>

The response to the ISMA proposal was depended on states. Most of developing countries responded affirmatively, some states including West Germany and Japan approved fundamentally. Canada and U.K. insisted on waiting for further discussions, U.S.S.R. and east European block with no response, and U.S.A. and Cuba opposed the ISMA proposal. According

to U.S.A., the establishment of ISMA would have political, financial and technical difficulties. <sup>(11)</sup>

In 1978, the states which had technical capability for such agencies as ISMA were only U.S.A. and U.S.S.R., the negative attitude from these two leading states directly meant the impossibility of establishing ISMA. At present, there is no international organization like ISMA except one; Western European Union (WEU) Satellite Centre in Spain founded in 1993.

### Changing Situation

#### Technology Development

After the ISMA proposal in 1978, the remote sensing technology which seems to be used for observation task has developed rapidly, especially in civil remote sensing. At the same time, international cooperation in this field has spread to many states and areas.

The resolution of sensors on board progressed drastically and the participants were increasing. In the near future, the resolution will be expected to reach 2 metre class or better.

In international cooperation, U.S.A., Japan etc. concluded the cooperation agreements for the reception of remote sensing data acquired by satellites. For instance, Japan agreed with the European Space Agency (ESA) for the acquisition of Japan's MOS-1 data in 1987. <sup>(12)</sup>

In addition, they began to prepare for the 1 metre class sensing data sales in U.S.A. President Bill Clinton decided to allow the commercial sales of high-resolution remote-sensing imagery by some US companies. According the Aviation Week & Space Technology, for the 1 metre class Lockheed, GDE/Orbital Science/Litton team and Ball Aerospace, and for the 3 metre class WorldView Corp. planned to participate into this market. <sup>(13)</sup>

#### Technical Feasibility of new ISMA

If we see these developments in remote-sensing technology, now we have to start again the feasibility study of new ISMA which uses the civil satellites' data positively.

Of course, because the military observation satellites (reconnaissance satellites) are thought to have a centimetre class resolution, it is impossible to replace all observation activities by reconnaissance satellites

with civil satellites. However, some aspects of the proposed functions in ISMA, for example to monitor the implementation of disarmament agreements and to investigate the disputing area, can be achieved effectively by the satellites with 1 metre or 2 metre class resolution. The report titled "The Implications of Establishing an International Satellite Monitoring Agency" <sup>(14)</sup> in 1981 which was written by experts appointed by the Secretary-General said that in monitoring the disarmament agreements, a resolution of 3-5 metre is needed for area surveillance and a needed resolution is 0.5 metre for close-look <sup>(15)</sup>. And in monitoring international crises, a resolution of 3-5 metre is sufficient for detection, while a resolution of 0.5 metre is sufficient to identify and describe most of the objectives <sup>(16)</sup>. According to this report, 1-2 metre class data which will be achieved by civil sector in the near future may be used for some parts of the ISMA functions.

Further, the end of the Cold War Era now brings the international society a new atmosphere to accept the establishment of international organizations which can contribute to the international security and stability.

#### WEU satellite centre

Western European Union (WEU) founded the satellite centre in Torrejón of Spain in 1993 and began its operations. This centre aims to contribute to the security of European area through the acquisition, processing and distribution of satellites' data. It plans to receive the data of Helios 1, the first European reconnaissance satellite to be operated by France, Italy and Spain jointly in the future, and it presently uses the data from SPOT, LANDSAT and ERS. Relationship between this Torrejón satellite centre and the security in European area is described as follows: "The security problems that have arisen in the Balkans, Eastern Europe and the Mediterranean region have made the creation of a space-based observation system for both military and civil purposes, that makes optimum use of existing resources, a matter of the utmost urgency." <sup>(17)</sup>

If we use this WEU satellite centre as a precedent, we can consider the revival of ISMA in order to prevent and respond to the small scale disputes we face in the present world.

## World Environmental and Disaster Observation System (WEDOS)

In this paper, one system proposal which may provide useful information to new ISMA in the future will be introduced.

In 1987, the Society of Japanese Aerospace Industries, Inc. proposed one satellite system called WEDOS (World Environmental and Disaster Observation System). The purpose of this system is to monitor changes of the Earth environment and the situation of disaster from outer space in order to minimize the damages. This system makes all the areas of the Earth monitored at least once a day. However, in this proposal and study, there was not any reference to security problems directly.

WEDOS is composed of two parts, remote-sensing satellites which install sensors and a ground system which receives and processes the data. This is a typical combination of remote-sensing systems.

The most different points from the present remote-sensing systems are the numbers of satellites and the resolution of sensors. According to the WEDOS proposal, 38 satellites will be launched into the orbit. 8 satellites in 3 different sun-synchronous orbits, 2 satellites in a sun-asynchronous orbit and additional 12 relay satellites are planned to be used. By these satellites, we can observe all the areas of the Earth once a day and if necessary, the frequency will be increased by moving sensors to the point to be seen (the pointable function). As compared with the existing systems, this frequency is very high. For example, the LANDSAT system can observe one point every 16 days.

The resolution of sensors on the WEDOS satellites will be developed drastically. The best resolution of the sensors on satellites, visible near-infrared sensor is planned to reach 2 metre. In the existing systems, the resolution of LANDSAT is 30 metre, SPOT of France is 10 metre and ERS of ESA is 25 metre. As I already mentioned above, 2 metre resolution is sufficient for detection of the objects in verifying the disarmament agreements and monitoring international crises.<sup>(18)</sup> (See the Table 1)

As we consider the technical capability, although the security problems are not referred in the plan, WEDOS may contribute to the area surveillance and detection which were described in the ISMA report in 1981. Further, when we see

in the WEU report that the challenge (of WEU satellite centre) is to integrate military and civil aims in order to achieve optimum use of existing resources, which would not be sufficient to create independent systems<sup>(19)</sup>, we have to consider the feasibility of the new ISMA which may use the civil satellites' high-resolution data effectively. However, I here emphasize that WEDOS system is planned to be used for monitoring change of the Earth environment and the situation of disaster in order to minimize the natural damage which is proposed by the Society of Japanese Aerospace Industries, Inc.

## Conclusion

If the new ISMA revives in the future and plans to use the data of civil satellites, this ISMA may contribute to the international security and peace as one part of the new structure for maintaining the world order. For that purpose, now we have to start the feasibility study of new ISMA and exchange the opinion in technical and legal matters internationally.

## Note

1. Treaty on Open Skies. This treaty was signed on 24 March, 1992 in Helsinki by 25 states, but not into effect yet.
2. *Ibid.* Art. 6 .
3. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, 1967.
4. Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Anti-Ballistic Missile Systems, 1972.
5. Interim Agreement Between the United States of America and the Union of Soviet Socialist Republics on Certain Measures with Respect to the Limitation of Strategic Offensive Arms, 1972.
6. SALT II Treaty was signed on 18 June, 1979 during the Vienna Summit.
7. UN Doc. A/AC.1/7 (1978).
8. *Ibid.* 1. Guiding Principles of the Work of the Agency.
9. *Ibid.* 2. Functions of the Agency.
10. *Ibid.* 4. Technical Resources.
11. U.N.G.A. Doc. A/34/540 (1979).

12. This agreement is titled "Memorandum of Understanding between the National Space Development Agency of Japan and the European Space Agency for the direct reception and distribution of MOS-1 Data".
13. Joseph C. Anselmo, "HIGH-RESOLUTION SATELLITES COMPETITION HEATS UP," *Aviation Week & Space Technology*, 11 July, 1994, p.56.
14. UN Doc. A/AC.206/14 (1981).

15. *Ibid.* paras.136-160.
16. *Ibid.* para.169.
17. *The development of a European space-based observation system - Part II*, Assembly of Western European Union, Document 1393, 8 November, 1993, para.1.
18. *supra*, note 14 para.169.
19. *supra*, note 17 paras.45 and 46.

\* The analysis in this paper is my personal opinion and not the one of the Japanese government and its organization.

Table 1

Ground resolution required for the treaty verification and crisis monitoring (in metre)

Object	Detection	Recognition	Identification	Description
Bridges	6	4.5	1.5	0.90
Radar	3	0.9	0.3	0.15
Radiocommunications	3	1.5	0.3	0.15
Material depots	1.5	0.6	0.3	0.25
Troops units or bivouacs	6	2.1	1.2	0.30
Air base equipment	6	4.5	3	0.30
Artillery & Rocket	0.9	0.6	0.15	0.05
Aircraft	4.5	1.5	0.9	0.15
Headquarters	3	1.5	0.9	0.15
Ground-to-Ground missile & anti-aircraft sites	3	1.5	0.6	0.30
Medium-sized surface vessels	7.5	4.5	0.6	0.30
Vehicles	1.5	0.6	0.3	0.05
Land mine fields	9	6	0.9	0.025
Ports	30	15	6	3
Coast & landing beaches	30	4.5	3	1.5
Marshalling yards & railways shops	30	15	6	1.5
Roads	9	6	1.8	0.6
Urban areas	60	30	3	3
Military airfields		90	4.5	1.5
Submarine on the surface	30	6	1.5	0.9

Source: UN Doc. A/AC.206/14 (1981), p.30. Other sources, such as Senate Committee on Commerce, Science, and Transportation, *NASA Authorization for Fiscal Year 1978*, pp.1642-1643 and *Reconnaissance Hand Book* (McDonnell-Douglas Corporation, 1982), p.125 show almost the same figures.