U.N. - U.S. - C.I.S. SPACE DEBRIS POSITIONS

"HEAVENLY JUNK"

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A B S T R A C T

This paper presents the views at the United Nations in the United States on UN, US, and CIS Space Debris Positions. The CIS positions are basically those of the new nation of Russia. The paper discusses the importance of concluding an international treaty on nuclear power sources in outer space based on the many years of UN work on nuclear power sources, and directly caused debris. It is clear that this is only a limited and partial solution of the over all space debris problem. It also points out the need of a working study group approach in the UN exactly as was so well done in the UN for remote sensing. It further points out that nations should try to complete by the end of 1994 at the latest their current extensive legal and scientific studies on over all space debris problems. It concludes by showing the importance of a nuclear power source satellite treaty now. Only the nuclear space debris problem is on the UN agenda now. It should follow the general treaty drafting principles for all nations from the authors "Magna Charta of Outer Space for All Nations." These Magna Charta factors must be considered in the final drafting of a treaty now for nuclear power sources in outer space; and also for a separate and later treaty in 1995 for the overall space debris problem. It concludes with a discussion of the American Bar Association pending Resolution, and the US legal position with regards to overall space debris policies currently.

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In a recent speech to the National Space Society, at the New York Academy of Sciences, the interest in the subject of space debris as a universal

killer was intense. It has certainly much increased since May of 1988, when your author chaired an ABA International Space Debris Panel in Montreal, Canada. It is not a "back burner" subject any longer. The Panel members have since followed the indepth studies on orbital debris by both NASA and the European Space Agency and the US Inter Agency Space Group. Current interest in space debris is this past year also at a very high level because of the UN's eight years of study of setting regulatory standards for nuclear power sources in outer space. In the very brief time allotted, I will summarize for you current UN, US, and CIS (Russia) positions on space debris.

My comments are solely my own and are not to be attributed to any official or unofficial organization to which I belong or am a member or director.

The U.S. Space Command's tracking system in Colorado Springs of more than 7000 pieces of more than 10 cm. size of space debris, has been a continuing contributor to current public information to all nations for world peace and security on satellites launched, their orbits, and survivability in a constantly changing outer space debris environment, especially as to LEO & GEO and low perigee orbits.

What is currently transpiring in New York at the United Nations in the COPUOS (Committee on Peaceful Uses of Outer Space) Committee on Nuclear Power Sources and Space Debris? Substantive regulatory standards and international safety notification requirements are near formal adoption! The COPUOS Chairman has wisely issued a chairman's list of agreed matters on nuclear power sources in outer space for all nations.

Let it be clear that at this moment there is no mention of space debris or a definition of space debris in current international treaties or conventions. The much discussed international treaty at the UN on nuclear power sources satellites does <u>not</u> deal with <u>overall</u> space debris. It mainly deals with <u>nuclear</u> power source shieldings, utilizations, launch notifications, immediate threats, warnings, damages, recovery, and related nuclear outer space debris.

This paper proposes a maximum international treaty launch time limit for government reporting to UN Secretary General. 2 hours maximum is proposed for nuclear power satellite <u>launches</u>, and 24 hours maximum for reporting other launches, to U.N. Secretary General. Let it be clear that <u>only</u> nuclear power source debris remains currently on the U.N. Agenda. Why? Both <u>economic reasons</u> and costs of known debris remedial and preventative procedures, as well as <u>military</u>, national security reasons are why the <u>general topic</u> of space debris is <u>not yet</u> on the U.N. Agenda. By 1995 this may well have changed. Outer Space Debris is a unviersal threat for world national security, and world peace, and peacekeeping assurances.

Are space debris problems a currently pressing problem today at LEO (400 to 600 km) orbit and at the important geostationary orbit? Yes. Elsewhere, in outer space, No. Not yet. All agree the problem is very pressing if we wait any longer with international preventative measures, including those voluntarily taken now mainly by the U.S., ESA, Japan, and Russia. Presently, current U.N., active initiatives on the overall space debris problem are laudatory, and must be further internationally encouraged. No technical standardization and very little legal regulation exists as to the mitigation of overall orbital debris. In the US only the Office of Commercial Space Transportation considers debris generation as part of general safety in satellite design, and in whether or not to license a satellites US launch. This is as per U.S. President's Executive Order and U.S. legislation. We will have an almost insolvable space debris problem by the year 2000 at LEO, at GEO, and in polar orbits as well as a serious loss of launch windows for civilian, military and national security "eyes and ears" purposes if a treaty on overall space debris problem is not completed by end of 1995.

Nature has helped diminish some space debris, particularly at low Earth orbit, with the solar cycles of 1978 to 1980, and 1988 to 1990 by debris decay, burn up, and self destruction! The U.S. has since 1987 and for practical purposes a national policy that space debris, intentionally created for tests, or in any reasonable way controllable, will be held to an absolute minimum. Recently in 1993 Russian ground controllers have deliberately blown up in space an advanced military reconnaissance satellite. This is to prevent it from falling on people or property and being recovered by military or cilivian intelligence analysts. The explosion of the Cosmos 2,225 satellite in orbit marks the fourth time in the last few years that Russians have deliberatelly destructed one of their new imaging reconnaissance satellites. The destroyed satellite is an advanced version of a type that returns intelligence imagery to Earth in usual film pods. It may have utilized a nuclear power source. The UN remembers COSMOS 954! As in all three previous fights of this new design, the vehicle was ordered to explode after its mission was completed. The explosion February 18 came only 58 days following the satellite's launch. The satellite's deliberate destruct created hundreds of pieces of space debris in an orbit inclined 64.8 deg. Most of it fell out of orbit quickly.

The National Space Policy of the U.S. in November, 1989, states that "all space sectors will seek to minimize the creation of space debris... consistent with mission requirements and cost-effectiveness. And we will encourage other space-faring nations to adopt policies and practices aimed at debris minimization." This US policy remains in effect today, and would permit S.D.I. tests that

could also create space debris, which could well decay and burn-up with atmospheric drag heat.

The German Scientists have a new space debris proposal to remove larger objects than 1 cm. It involves a cycle of energy transfer and conversion with the help of a conductive space tether, and altitude loss with a "remover satellite."

The first set of new solar arrays by EVA's for Hubble Space Telescope in orbit are to replace old arrays which are to be returned to ESA for detailed examination. They are expected to yield very useful information on space debris and on micro-meteorites.

Space Station Freedom will have necessary shielding to prevent space debris damage from particles of less than 2 cms. This assumes no further substantial sizing changes or budget changes in Space Station Freedom after early 1993. Debris shielding has been well researched by the U.S. and is necessary and now provided in final planning. President Clinton has directed NASA Administrator Goldin to redesign the Space Station Freedom into a streamlined cost-effective design, assuring program stability during the transition and working closely with the U.S. Congress, and international partners to maintain continuity and participation. Japan, Canada and ESA have invested $8 Billion in the Space Station to date. Also current U.S. funded research policy is to develop nonpolluting rocket propellants that generate no orbital debris.

Dr. Derrin McKnight, of Command Sciences, and Dr. Nicholas Johnson, of Teledyne, and others have recommended that certain scientists, lawyers and public non-governmental organizations engage in informal, "so-called Track 2" discussions of space debris. This is useful and should be encouraged. Space Debris needs now much further scientific and legal study. I also do agree with Drs. McKnight and Johnson that the growth of space debris is linear, and not geometric; and that the correct formula for space debris is $E=1/2\ MV^2$. However, I disagree with Drs. McKnight and Johnson and believe that the time has come now to have a thoughtful "Working Study Group on Space Debris" created at the U.N. in its Outer Space Affairs Division coordinating with its COPUOS Scientific and Legal Sub-committees. This Working Group would work within the U.N., at least a couple of years, by coordinating data from governments with informal meetings of scientists and lawyers on the subject of so-called Track 2 informal diplomacy! This should clearly precede any final new U.S. national policy regulatory formulation, or recommendation for U.N. codification. It would repeat the international success of this Working Study Group approach in the U.N. that was so well done for remote sensing! Why can't the U.S. State Department, Defense Department, Transportation Department, Commerce Department, Energy Department, and the White House review their positions to strongly

support through the U.S. - U.N. Ambassador such a U.N. Working Study Group on Space Debris, now?

That is my policy recommendation. It follows former President Bush's handwritten personal letter to me advocating a "broad vision approach to space." It follows President Clinton's and Vice President Al Gore's current support of outer space policy. The letter of former President Bush followed his reading of my Magna Charta of Outer Space for All Nations. The Magna Charta has been published in several languages as an International Astronautical Academy Official Note, first in 1983, then in the New York Times and in Acta Astronautica. It is the source of worldwide treaty principles for new outer space treaties consideration and is now widely internationally accepted, in several languages, most recently in French.

The C.I.S. nations say informally, in the U.N., that now is the time for a new outer space agreement on overall space debris and perhaps on international outer space testing. The Russians also say informally that now is the time for the establishment of a U.N. authoritative international outer space trackable debris catalog. With both of these suggestions, the author has serious reservations at this time. We should first look forward to the informal Track 2 diplomacy and non-diplomatic debates on those suggestions! The Russians indicate informally that the U.S. caused approximately 48% of trackable outer space debris and that the old U.S.S.R. caused 41% thereof, while other nations caused some 10% thereof. The old USSR previously out launched the U.S. in outer space, annually, by a factor of at least 3 to 1. I wonder what the sources of these percentages are? The total C.I.S. launch rate for 1993 may well be only equal to the U.S. launch rate, or less! The more launches, the more potential for more outer space debris this century.

On the U.N. developed formal agreement side, there is no doubt that the Nuclear Test Ban Treaty, the 1967 Outer Space Principles Treaty (Article 9), the 1972 Liability Treaty, plus the 1986 Rescue and Return Treaty all apply to space debris, indirectly and legally. With the exception of the damages caused by Cosmos 954 in Canada and the Skylab in 1978 in Australia, we have really had to date very little outer space debris damage on the surface of the earth, as the oceans and atmosphere have "enjoyed" most of it. Much debris remains in outer space orbit, and it is steadily increasing, as the science studies show.

As I see it, currently the most serious problems from space debris are harm to national security, peace-keeping satellites and creating of tracking problems from space debris for optical and electronic astronomy, research, etc. The biggest and most current active risk from natural and man made space debris to operating satellites, is at LEO, at GEO, and at the polar orbits of the Earth, and at sunsynchronous orbit.

The time is now for the U.N., the U.S., and also Russia with US - UN leadership, to exercise strong efforts for the creation of a U.N. Outer Space Working Study Group on Space Debris. When the U.N. finishes in late 1993 or early 1994 with its current deliberations on international safety standards and "regulations" for nuclear power sources in outer space, then a treaty should go forward on it, with U.S. support. This will promote strong U.S. outer space leadership and will foster the development later of a proper international overall space debris policy, and treaty for all nations within the next three years. At that time in 1995 or 1996, I will reintroduce my American Bar Association Resolution through its Section of Science and Technology that "The ABA urges preparation of an international convention that would provide for the prevention of the creation of space debris and the pollution of outer space in any manner whatsoever to the greatest extent feasible and practical consistent with each nation's national security." I am not recommending this proposed ABA resolution to the Council of the ABA Section on Science and Technology until a U.N. Working Study Group in the U.N. Outer Space Affairs Division has thoroughly studied the overall legal and scientific space debris problems at the U.N. and made recommendations acceptable for all nations directly involved.

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