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HEAVENLY JUNK III - SPACE DEBRIS

REMARKS OF AMB. EDWARD R. FINCH, JR.  
NATIONAL SPACE SOCIETY - BOARD OF DIRECTORS  
AND NSS NGO REPRESENTATIVE AT UNITED NATIONS  
ELECTED MEMBER, INTERNATIONAL ASTRONAUTICAL ACADEMY  
INTERNATIONAL ASTRONAUTICAL FEDERATION, INTERNATIONAL  
INSTITUTE OF SPACE LAW, AIAA, AMERICAN  
BAR ASSOCIATION, CHAIR, NEW YORK STATE BAR  
ARMS CONTROL & NATIONAL SECURITY, FORMER U.S. SPECIAL AMBASSADOR.  
AUTHOR ASTROBUSINESS, GUIDE TO COMMERCE AND LAW OF OUTER SPACE  
"SEE DISPLAY PHOTO OF ED FINCH SEATED IN MIR PROTOTYPE IN RUSSIA"

ABSTRACT

This third edition of my studies on Space Debris will addresses recent U.N. developments concerning legal issues arising in relations to space debris. The political position of nations on it has much evolved over the past 10 years. The UN COPUOS position has been briefly reviewed. The positions for and against the drafting currently of a new treaty on the prevention of outer space debris at LEO, MEO, GEO, and HEO, as well as at L.5 orbit are much considered.

Current national voluntary space debris compliance by major space capable nations should be clarified and updated possibly in a draft U.N. preventative type orbital debris treaty. It should cover both nuclear and nonuclear types of debris.

Governments, nongovernmental organizations, and private organizations are

involved for more than two decades in space debris study. Millions of dollars, francs, and rubles have been spent. Space debris is both natural (mostly meteoroids and cosmic) and man-made ("mostly parts of inactive space objects often generated in outer space by break-ups of space objects, spacecraft, payloads, fragments, shrouds, rockets, exhausts, etc."). The I.T.U. has found interference with telecommunications and station keeping.

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Serious debris can be only a fraction of a millimeter. Is the space debris problem urgent? No. Is it serious yet to the peaceful utilization by all nations of outer space? Yes, for Low Earth Orbit, Geostationary orbit, and Yes by the year 2000 for all vital Orbits. Composites "shielding" must be

designed - engineered for space stations, and for large government and commercial satellites, as well as for the many new small telecommunications satellites. I remember a speaker whose entire speech was "My Address is 605 Third Avenue, New York City Good-night." Mine will be almost that short with hopefully many questions from you at the end. We can even do a one or two hour space debris seminar on U.N. Developments at this convention, if enough people wish to do so.

Space debris is now officially on the Agenda of United Nation's Committee on Peaceful Uses of Outer Space; principally at its Scientific and Technical Subcommittee and in U.N. Outer Space Affairs Division, and in U.N. Working Group. The 1979 Moon Treaty revision, often mentioned, is not on the U.N. official COPUS agenda in 1995. See A.149/618. Para 42. Space debris now includes technical discussions on nuclear power sources uses in outer space and the 10 consensus principles now U.N. agreed. U.N. General Assembly Resolution 49/34 now also calls for much agreed increased nuclear power sources space debris efforts. These are principally advance notification of earth impact, safety, recovery and assistance international principles in regards to nuclear power sources and outer space. General Assembly Resolution 46/45.

Space debris and orbital debris are terms often used interchangeably, but orbital

debris must technically be in some orbit to be correctly so referred. There is no international legal official agreed definition of space debris. See: A/AC 105/514. Paragraph 19. However growing U.N. consensus accepts "any man made earth orbiting object which is non-functional with no reasonable expectation of assuring or resuming its intended function or any other function for which it is or can be expected to be authorized including fragments and parts thereof." There exists no official international space debris treaty as yet, although several existing treaties deal with aspects thereof. More and more frequently a new space debris treaty is proposed. Current national mitigation compliance is on a self-interest voluntary national basis.

Many nations have official national policies on it, which are well followed. Only about 6% of catalogued space objects today are operational. On February 26, 1995 NASA officials said that puzzling clouds of objects orbiting the Earth are radioactive debris leaking from abandoned Russian nuclear powered rockets. US Space Command tracks about 7000 debris objects larger than 10cm. The U.S. has a new telescope at Mt. Haleakala Observatory in Maui, Hawaii to be completed in October 1996 to improve space debris tracking.

There are many scientific and technical programs of U.N. member States on space debris. At A/AC/105/574 (June 6-17, 1994: Vienna) in paragraph 29 thru 41, pages 21 to 27 there

is a summary of European Space Agency, U.S., UK, German, France, etc. extensive scientific work on tracking, modelling, observation, and mitigation space debris work which is reported as it progresses regularly to U.N. Committee on Peaceful Uses of Outer Space. U.S. Policy requires minimization of orbital debris. U.S. standards and criteria are sponsored by the Office of Safety and Mission Quality at NASA Headquarters. NASA uses 4 categories namely (1) control of debris released (2) control of debris collision (3) post mission disposal and (4) Footprints for recent strategy and debris. Remember current ODERACS spheres released to test methods of detecting space debris. The earlier Long Duration Exposure Facility which was retrieved yielded a wealth of information on space debris. The recent U.N. Inter Agency Orbital Debris Coordination Committee of NASA, ESA, NASDA, and RDA (Russian Space Agency) is very active. There are over 1000 excellent publications now on space debris. Data on objects in space, listed and computed by national agencies can now be accessed through Inter net! There is the excellent current NASA Satellite Situation Report available.

The U.N. Working Plan on Space Debris is organized by the three M's! Year 1996 Measurements; year 1997 Modelling; and year 1998 Mitigation measures. The mega-LEO (i.e. BigLeo) projects for world-wide telecommunications, such as IRIDUM, Globalstar, and

Odyssey (ITT) have recognized in their planning and design the need to actively address the space debris threats at LEO, as has the Freedom Space Station. For GEO the creation and wide international voluntary use of the "garbage orbit" is almost universally accepted. Vice President, Al Gore said six years ago "orbital debris is already a problem of considerable importance; consequently, laws to control further proliferation will be needed."

Motorola, Satcom and other corporations to day, and many other nations; in outer space now look at space debris as not only a systems engineering, design, and cost/trade off analysis, but also as an operational consideration for the near and longer term future. Even the outer space insurers are weighing debris factors in risk analysis especially at LEO and GEO orbits.

In the new space debris world at Princeton Synergetics it is proposed that existing communications satellites could be used to detect the debris left by shattered rocket segments and dying satellites!! It would require special ground software, but no new hardware on the satellites and communications would not be interrupted. The International Telecommunications Union has recently for the first time addressed the space debris problems of telecommunications. There are now approximately 70,000 debris objects larger than 1cm in various orbits. There is a growing realization

that launch windows may be lost due to space debris, to say nothing of the environmentalists (Art. IX - 1967 Outer Space Treaty) and astronomers growing concerns with space debris.

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Governments, nongovernmental organizations, and private organizations are involved for more than two decades in space debris study. Millions of dollars, francs, and rubles have been spent. Space debris is both natural (mostly meteoroids and cosmic) and man-made ("mostly parts of inactive space objects often generated in outer space by break-ups of space objects, spacecraft, payloads, fragments, shrouds, rockets, exhausts, etc.") Serious debris can be only a fraction of a millimeter. Is the space debris problem urgent? No. Is it serious yet to the peaceful utilization by all nations of outer space? Yes, for low Earth Orbit, Geostationary orbit, and Yes by the year 2000 for all vital orbits. Composites "shielding" must be designed - engineered for space

stations, and for large government and commercial satellites, as well as for the many new small telecommunications satellites.

Mr. Goldin, NASA's Administrator, questioned the reliability of the current risk estimates, saying the empirical data were too sketchy. "People make all their projections based on the absence of evidence," he said. "We're working to get better information."

He also noted that Russia's Mir station, which has been in orbit for eight years, had apparently suffered no penetrations from space junk. "They think we're overly conservative," he said of the Russians.

Mr. Goldin said that when a space shuttle rendezvoused in the near future with the Mir station he would want a camera on the shuttle's robot arm to examine every inch of Mir for dents. Three found.

"We're not going to do anything irresponsible," he said of the plans for the new station. "We're not going to launch anything that has an unacceptable risk. But we also can't afford to use space as a dumping ground. We need an international agreement for controlling the contamination of space."

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debris treaty. It should cover both nuclear and nonnuclear types of debris. Now that nuclear proliferation Treaty the Nuclear Pro-liferation Treaty is "indefinitely extended" the U.N. should do a space debris treaty. Thank you.