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Department of Defense
INSTRUCTION

March 31, 2000
NUMBER 3100.11

ASD(C3I)

SUBJECT: Illumination of Objects in Space by Lasers

References:
(a) DoD Directive 3100.10, "Space Policy," July 9, 1999
(b) Director of Defense Research and Engineering Memorandum, "Irradiation of Aircraft and Satellites by Lasers," July 24, 1970 (hereby partially superseded)
(c) Secretary of Defense Memorandum, "DoD Policy on Blinding Lasers," January 17, 1997
(d) DoD Directive 2060.1, "Implementation of and Compliance with Arms Control Agreements," July 31,1992

1. PURPOSE

This Instruction:

1.1. Implements policy, assigns responsibilities, and prescribes procedures under reference (a) regarding the illumination of satellites by lasers to protect space assets from any potential harm that could be caused by such illumination.

1.2. Supersedes those portions of reference (b) pertaining to the illumination of satellites by lasers. Those portions of reference (b) pertaining to the illumination of aircraft by lasers remain unchanged.

2. APPLICABILITY AND SCOPE

2.1. This Instruction applies to the Office of the Secretary of Defense, the Military Departments, the Chairman of the Joint Chiefs of Staff, the Combatant Commands, the Inspector General of the Department of Defense, the Defense Agencies, the DoD Field Activities, and all other organizational entities within the Department of Defense (hereafter referred to collectively as "the DoD Components").

2.2. The scope of this Instruction includes all DoD laser activities. It addresses both the planned laser illumination of an object in space as well as the inadvertent illumination of such an object by the emission of energy from a laser aimed above the horizon. The Chairman of the Joint Chiefs of Staff (CJCS), in coordination with the Combatant Commanders and other DoD Components, as appropriate, shall establish detailed implementation procedures regarding the illumination of objects in space by lasers.

3. DEFINITIONS

Terms used in this Instruction are defined in enclosure 1.

4. POLICY

It is DoD Policy that:

4.1. Laser activities are vital to U.S. space activities for such military applications as detection, ranging, tracking, communication, calibration, imaging, surveillance, vulnerability assessment, targeting, and negation.

4.2. All DoD laser activities shall be conducted in a safe and responsible manner that protects space systems, their mission effectiveness, and humans in space, consistent with national security requirements, in accordance with reference (a). All such activities shall be coordinated with the Commander in Chief of U.S. Space Command (CINCSPACE) for predictive avoidance or deconfliction with U.S., friendly, and other space operations.

4.3. The use of lasers specifically designed to cause permanent blindness in humans is prohibited, in accordance with reference (c).

4.4. Any test, series of tests, demonstration, or exercise of a laser illuminating a satellite in space shall be submitted to the Secretary of Defense (SecDef) for approval if:

4.4.1. It has the potential to disrupt, deny, degrade, or destroy the target;

4.4.2. Congressional notification is deemed appropriate;

4.4.3. It is the first such test, series of tests, demonstration, or exercise of its kind;

4.4.4. It is a vulnerability test illuminating a live satellite in space;

4.4.5. Foreign government notification is deemed appropriate;

4.4.6. It raises a significant issue of compliance with arms control treaty obligations;

4.4.7. It raises a significant issue of compliance with other international legal obligations; or

4.4.8. It requires coordination with other U.S. Government departments and agencies.

4.5. Any test, series of tests, demonstration, or exercise of a laser shall not require SecDef approval if it does not meet one or more of the criteria of paragraph 4.4 and is illuminating:

4.5.1. A point in space;

4.5.2. An object above the horizon or in space for the sole purpose of detection, pointing, ranging, tracking, communications, calibration, or imaging; or

4.5.3. A missile or air defense target for which foreign government notification is not deemed appropriate, does not require coordination with other U.S. Government departments and agencies, does not raise a significant issue of compliance with arms control treaty obligations, or does not raise reasonably an issue of compliance with other international legal obligations.

4.6. Requests shall be considered from other U.S. Government departments and agencies to review the proposed laser illumination of a U.S. object above the horizon or in space and provide predictive avoidance, approving such proposals where appropriate.

4.7. Requests shall be considered from non-U.S. Government entities to review the proposed laser illumination of a U.S. object above the horizon or in space and provide predictive avoidance on a non-interference basis, approving such proposals where appropriate.

5. RESPONSIBILITIES

5.1. The Assistant Secretary of Defense (Command, Control, Communication, and Intelligence)/Chief Information Officer (ASD(C3I)/CIO) shall:

5.1.1. Develop, coordinate, and oversee implementation of this Instruction, in coordination, as appropriate, with the Under Secretary of Defense for Acquisition, Technology, and Logistics (USD(AT&L)) and the Under Secretary of Defense for Policy (USD(P)).

5.1.2. Oversee compliance by the Director of the National Reconnaissance Office with this Instruction.

5.1.3. Coordinate requests for any test, series of tests, demonstration, or exercise of a developmental laser capability illuminating a satellite in space, that requires SecDef approval, with the USD(AT&L), the USD(P), the General Counsel of the Department of Defense (GC, DoD), the CJCS, and, as appropriate, the Secretaries of the Military Departments and other Heads of the DoD Components.

5.2. The Under Secretary of Defense for Acquisition, Technology, and Logistics shall oversee DoD activities to ensure that all DoD laser activities fully comply with arms control treaties and associated international agreements, in accordance with reference (d).

5.3. The Under Secretary of Defense for Policy shall:

5.3.1. Coordinate all laser activities that require SecDef approval, as appropriate, with other U.S. Government departments or agencies through the National Security Council.

5.3.2. Coordinate requests for any test, series of tests, demonstration, or exercise of an operational laser activity illuminating a satellite in space, that requires SecDef approval, with the ASD(C3I)/CIO, the USD(AT&L), and the GC, DoD.

5.3.3. Manage the notifications of, or consultations with, foreign governments, as appropriate, for applicable laser activities that require SecDef approval.

5.4. The General Counsel of the Department of Defense, consistent with reference (d), shall ensure that DoD laser activities comply with U.S. and applicable international law and shall provide legal guidance and advice for all laser activities submitted for SecDef approval.

5.5. The Assistant Secretary of Defense for Legislative Affairs (ASD(LA)) shall manage, as appropriate, notifications of and consultations with the U.S. Congress regarding all laser activities that require SecDef approval, in coordination with the ASD(C3I)/CIO, the USD(AT&L), and the GC, DoD.

5.6. The Assistant Secretary of Defense for Public Affairs (ASD(PA)) shall manage, as appropriate, public affairs activities regarding all laser activities that require SecDef approval in coordination with the ASD(C3I)/CIO, the USD(AT&L), and the GC, DoD and other DoD Components, as appropriate.

5.7. The Secretaries of the Military Departments shall organize, train, and equip forces necessary to support the U.S. Space Command's Laser Clearinghouse and the alternate Laser Clearinghouse.

5.8. The Chairman of the Joint Chiefs of Staff shall:

5.8.1. Coordinate requests for any test, series of tests, demonstration, or exercise of an operational laser activity illuminating a satellite in space, that requires SecDef approval, with the USD(P), the CINCSPACE, other affected Commanders of the Combatant Commands, and as appropriate, the Chiefs of the Military Services.

5.8.2. Forward all reports of laser activities inadvertently conducted outside authorized parameters, when notified, to the Deputy Secretary of Defense (DepSecDef), the USD(AT&L), the USD(P), and the ASD(C3I)/CIO. Such reports shall include a summary of the laser event and an assessment of any satellite or humans in space that could be inadvertently and adversely affected.

5.8.3. Coordinate the 12-month Laser Test Master Schedule with the USD(AT&L), the ASD(C3I)/CIO, the USD(P), and the GC, DoD.

5.8.4. Submit the 12-month Laser Test Master Schedule to the DepSecDef for information on a quarterly basis.

5.9. The Commander in Chief of U.S. Space Command shall:

5.9.1. Maintain and operate the Laser Clearinghouse to support the safe and responsible conduct of laser activities, consistent with national security requirements.

5.9.2. Generate requirements for the Laser Clearinghouse, in coordination with the DoD Components, as appropriate, to provide the full range of services required to implement this Instruction.

5.9.3. Establish a process to review the proposed illumination of an object above the horizon or in space and either provide predictive avoidance or certify a process for providing predictive avoidance that satisfies national security requirements, as appropriate, for the DoD Components and other U.S. Government department and agency laser activities, in accordance with this Instruction.

5.9.4. Establish a process, in coordination with the DoD Components, as appropriate, to review the proposed illumination of an object above the horizon or in space and provide predictive avoidance for non-U.S. Government entity laser activities on a non-interference basis.

5.9.5. Grant waivers to the Laser Clearinghouse process in accordance with this Instruction.

5.9.6. Establish and maintain a 12-month Laser Test Master Schedule of all DoD laser activities that involve any test, series of tests, demonstration, or exercise of a laser illuminating a satellite in space that meet the criteria of paragraph 4.4.

5.9.7. Submit the 12-month Laser Test Master Schedule to the DepSecDef for information through the CJCS on a quarterly basis.

5.9.8. Report all potential arms control non-compliant laser activities to the USD(AT&L).

5.9.9. Ensure that the Laser Clearinghouse:

5.9.9.1. Evaluates requests to review the proposed illumination of an object above the horizon or in space, provides predictive avoidance, and provides safe laser operating parameters when proposed laser activities comply with this Instruction.

5.9.9.2. Develops procedures to implement this Instruction.

5.9.9.3. Assists DoD owners and operators of lasers to develop procedures that implement this Instruction.

5.9.9.4. Coordinates with the Director of the National Reconnaissance Office any laser illumination above the horizon or in space that involves a U.S. reconnaissance satellite.

5.9.9.5. Reports all laser activities inadvertently conducted outside authorized parameters, when notified, to the CJCS.

5.10. The Heads of DoD Components shall:

5.10.1. Submit to the CINCSPACE requests to review the proposed illumination of an object above the horizon or in space and obtain predictive avoidance for any laser activity with the potential to affect satellites or humans in space.

5.10.2. Obtain permission to illuminate a satellite.

5.10.3. Conduct, or assist CINCSPACE in the conduct of, a legal review of any planned illumination of any non-DoD satellite.

5.10.4. Submit through the CJCS any test, series of tests, demonstration, or exercise of an operational laser illuminating a satellite in space that requires SecDef approval.

5.10.5. Submit through the ASD(C3I)/CIO any test, series of tests, demonstration, or exercise of a developmental laser illuminating a satellite in space that requires SecDef approval.

5.10.6. Submit quarterly to the CINCSPACE for incorporation into the Laser Test Master Schedule, a 12-month schedule of any test, series of tests, demonstration, or exercise of a laser illuminating a satellite in space that meet the criteria of paragraph 4.4.

5.10.7. Submit to the ASD(LA) a draft legislative affairs plan for all laser activities that require SecDef approval.

5.10.8. Submit to the ASD(PA) a draft public affairs plan for all laser activities that require SecDef approval.

6. PROCEDURES

6.1 DoD laser owners and operators shall conduct laser activities in accordance with the following procedures (see enclosure 2):

6.1.1. Follow the Laser Clearinghouse process for review of proposed illumination of an object above the horizon or in space and obtain predictive avoidance for the laser activity, unless the CINCSPACE has granted a waiver to its process in accordance with this Instruction.

6.1.1.1. Provide to the Laser Clearinghouse the predicted laser system radiance distributions in space for each planned laser illumination.

6.1.1.2. Submit a request to the CINCSPACE to review the proposed illumination of an object above the horizon or in space and obtain predictive avoidance for the laser activity when the potential to affect satellites or humans in space is uncertain.

6.1.2. Obtain permission to illuminate a satellite by one of the following methods:

6.1.2.1. Selecting a target from the unrestricted satellite list, maintained by the CINCSPACE, that can be illuminated safely within authorized maximum safe laser exposure levels.

6.1.2.2. Securing the permission of the satellite owner and operator to illuminate a satellite that is on the restricted satellite list, maintained by the CINCSPACE, and providing a copy of such permission to the CINCSPACE.

6.1.2.3. Securing permission to illuminate a satellite that is on the restricted list from the DepSecDef through the review and approval of a program or project plan in coordination with the satellite owner and operator.

6.1.3. After securing permission to illuminate a satellite in space, obtain DoD approval to conduct laser activities by the following process:

6.1.3.1. Requests for any test, series of tests, demonstration, or exercise of a developmental laser capability illuminating a satellite in space that require SecDef approval shall be submitted by the Secretary of the Military Department to the ASD(C3I)/CIO.

6.1.3.2. Requests for any test, series of tests, demonstration, or exercise of an operational laser capability illuminating a satellite in space that require SecDef approval shall be submitted by the Head of the DoD Component to the CJCS.

6.1.3.3. All test requests shall be submitted for approval no later than 60 days prior to the intended test start.

6.1.3.4. Any sudden or unforeseen test sensitivities, schedule changes, or other factors involving tests that require SecDef approval shall be forwarded immediately in accordance with the procedures outlined in subparagraphs 6.1.3.1. and 6.1.3.2.

6.1.4. Obtain and use specific parameters from the Laser Clearinghouse within which the laser activities may be conducted safely.

6.1.5. Seek clearance from the USD(AT&L), through the appropriate Compliance Review Group, before taking an action that reasonably raises an issue of DoD compliance with an arms control agreement. Clearance shall be sought if there is doubt whether such clearance is necessary.

6.1.5.1. Provide the results of the compliance review to the CINCSPACE.

6.1.6. Secure final authorization from the CINCSPACE to emit energy from the laser at the target prior to commencing any laser activities that are not waived.

6.1.7. Monitor the execution of authorized laser activities and immediately report any deviation from approved parameters to the CINCSPACE for determination of the laser illumination's potential to inadvertently and adversely affect satellites or humans in space.

6.2. The CINCSPACE shall ensure that laser activities are conducted in accordance with this Instruction. Additionally, the Laser Clearinghouse shall:

6.2.1. Evaluate requests to review proposed illuminations of objects above the horizon or in space and provide predictive avoidance for any laser activities having the potential to affect satellites or humans in space.

6.2.2. Establish and provide to the laser operator specific safe illumination parameters within which the laser activities shall be conducted. Such parameters shall include all necessary data to ensure safe laser activities.

6.2.3. Review all requests for waivers to the Laser Clearinghouse process. The CINCSPACE may grant a waiver to the Laser Clearinghouse process when none of the criteria in paragraph 4.4. apply and the laser activity:

6.2.3.1. Is below authorized maximum safe exposure levels; and

6.2.3.2. Has been determined by the DoD Component responsible for the activity, pursuant to reference (d), not to reasonably raise an issue of DoD compliance with a treaty obligation, or has been determined to be, or certified as, compliant with relevant treaty obligations.

6.2.4. Not request a waiver from CINCSPACE if there is uncertainty about compliance with the above criteria.

6.2.5. Identify and maintain a list of unrestricted satellites, approved by the satellites' owners and operators, that may serve as targets for non-destructive laser activities (e.g., ranging, tracking, calibration, imaging).

6.2.6. Identify and maintain a list of satellites that are restricted as targets for laser activities.

6.2.7. Catalog and maintain a record of all DoD laser activities that have been requested through or reported to the Laser Clearinghouse.

6.2.8. Coordinate with U.S. Government and other satellite owners and operators, as appropriate, to establish authorized maximum safe laser exposure levels for the illumination of their satellites.

6.2.9. Coordinate with DoD laser owners and operators to establish laser system radiance distributions in space.

6.3. DoD satellite owners and operators shall support the conduct of laser activities in accordance with the following procedures:

6.3.1. Monitor execution of authorized laser activities if feasible and practical.

6.3.2. Report any suspected unauthorized laser illumination to the CINCSPACE for assessment.

6.3.3. Provide to the Laser Clearinghouse the satellite's specific maximum safe exposure levels for laser illumination or assist it to determine the best protection approach.

7. EFFECTIVE DATE

This Instruction is effective immediately.

Enclosures – 2
E1. Definitions
E2. Process Flow Chart

E1. ENCLOSURE 1
DEFINITIONS

E1.1. Developmental Test and Demonstration. Tests that involve capabilities that are not operational or have not been apportioned for planning or employment by the Joint Staff.

E1.2. DoD Laser Activities. Any DoD or DoD-sponsored laser research, development, or developmental or operational test, evaluation, or exercise, funded by, operated under the auspices of, or conducted by DoD. For purposes of this issuance, laser activities include those activities that may be conducted to, in, through, or from space, or aimed above the horizon with the potential to inadvertently or adversely affect satellites or humans in space.

E1.3. Illumination. The emission of energy from a laser directed at a target.

E1.4. Object. Any target or satellite in space which is intentionally or inadvertently illuminated.

E1.5. Operational Test and Exercise. Tests that involve capabilities that are operational or have been apportioned for planning or employment by the CJCS.

E1.6. Negation. Measures to disrupt, deny, degrade, or destroy any space systems and services used for purposes hostile to U.S. national security interests.

E1.7. Predictive Avoidance. A process that may be conducted in either a centralized, decentralized, or other approved method certified by CINCSPACE that involves the analytical and geometrical method used to:

E1.7.1. Ensure that laser illuminations do not impact upon the safe and effective operation of a satellite;

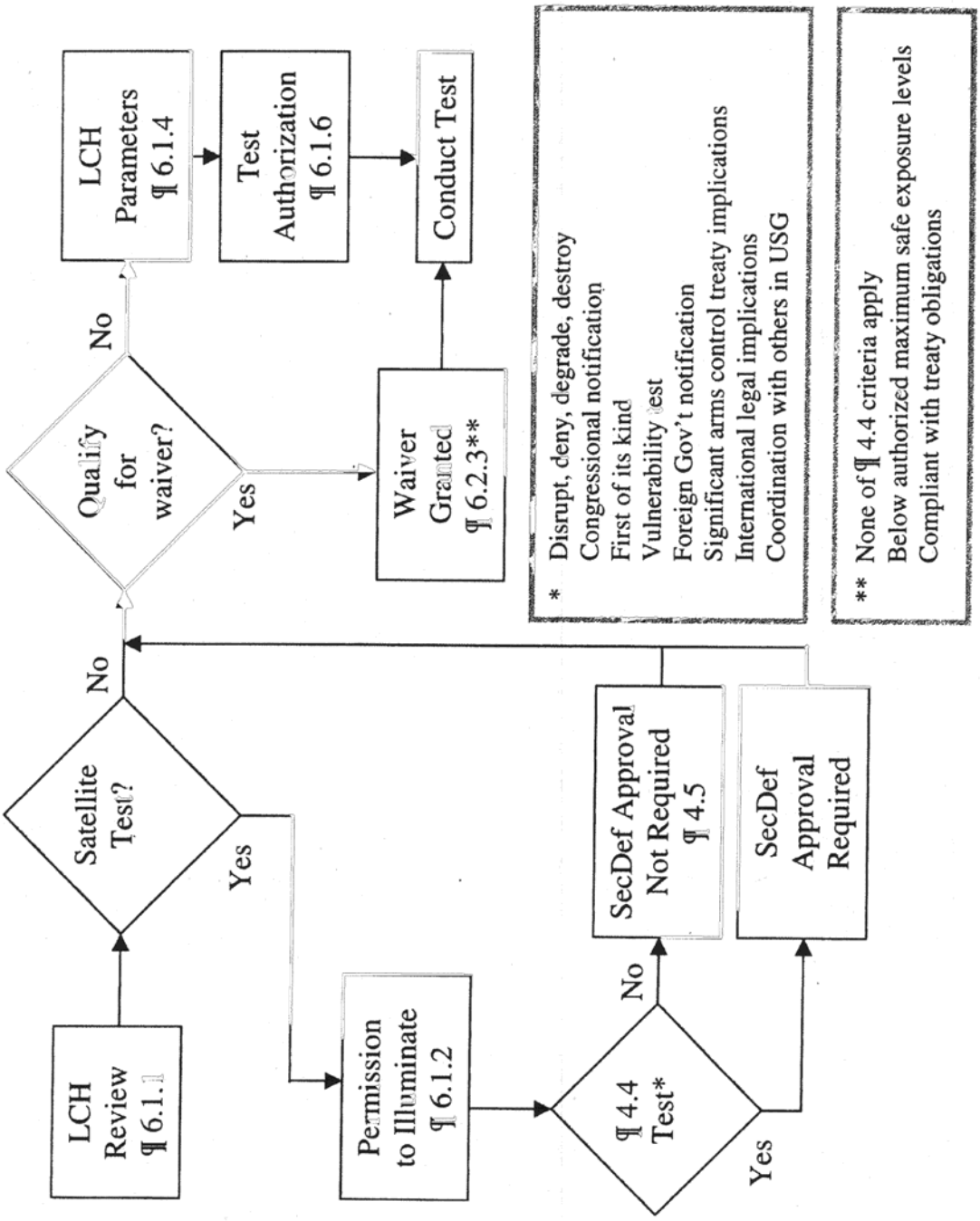
E1.7.2. Determine if a specific satellite may be inadvertently illuminated; and

E1.7.3. Make informed decisions on the safety of laser activities to, in, through, or from space, or aimed above the horizon.

E1.8. Protection. Active and passive defensive measures to ensure that U.S. and friendly space systems perform as intended by seeking to overcome an adversary's attempts to negate U.S. and friendly space systems and minimize damage if negation is attempted.

E1.9. Satellite. Any human-made Earth orbiting object.

E1.10. Target. Any satellite, star, point in space, aircraft, or missile that is the object of intentional illumination for the purpose of laser research; development; developmental or operational testing, evaluation, or exercise.

E1.11. Testing. All tests, series of tests, demonstrations, or exercises of a laser, laser technology, or emerging laser technology.

E2. ENCLOSURE 2
PROCESS FLOW CHART