CHAIRMAN OF THE JOINT CHIEFS OF STAFF INSTRUCTION

J-3 CJCSI 3225.01C
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PROCEDURES FOR MANAGEMENT OF
ILLUMINATION OF OBJECTS IN SPACE

References:
See Enclosure E

1. Purpose. This instruction establishes Chairman of the Joint Chiefs of Staff (CJCS) guidance, assigns responsibilities, and defines procedures for illumination of objects in space by lasers. The instruction serves to protect satellites from a reasonable expectation of harm or disruption in accordance with (IAW) references (a) through (e).

2. Superseded/Cancellation. CJCS Instruction 3225.01B, 29 March 2023, "Procedures for Management of Illumination of Objects in Space" is hereby superseded.

3. Applicability. This instruction applies to the Joint Staff, Combatant Commands (CCMDs), Services, and all Department of War (DoW) agencies and activities involved in the development, acquisition, or employment of laser systems. This includes DoW or DoW-sponsored laser research, development, developmental test, operational test, evaluation, exercise, and routine operational activity that is funded by, operated under the auspices of, or conducted by DoW with the potential to adversely affect a satellite or humans in space.

4. Policy

a. All DoW-owned, -operated, or -leased laser activities in space or that intend to direct energy above the horizon will be conducted in a safe and responsible manner, consistent with national security requirements. Managing the associated risks to space systems enables the mission effectiveness of those systems and of humans in space IAW references (a) and (b).

b. DoW-owned, -operated, or -leased laser activities that intend to direct energy above the horizon or in space will be registered with Commander, U.S. Space Command (CDRUSSPACECOM) for categorization. Laser activity coordination, notification, and risk mitigation requirements will be based upon the laser activity Category I, II, or III, as defined in Enclosure B.

c. Operational employment of laser activities that are approved, accepted, and integrated into a DoW "weapon system" as defined by the current DoW Dictionary of Military and Associated Terms is authorized without further coordination when operated IAW the applicable rules of engagement and orders. Coordinate above-the-horizon laser activities with CDRUSSPACECOM when not governed by rules of engagement or orders (e.g., testing, training, exercising, and maintenance).

d. DoW resident space object (RSO) research, development, acquisition, and operations activities will implement mission assurance measures to minimize the risk of damage from intentional and unintentional laser illumination from any source, taking into consideration the proliferation of commercial and government laser systems, both foreign and domestic. DoW activities leasing satellite services are encouraged to utilize providers that implement mission assurance measures to minimize the risk of damage from laser illumination.

e. As resources allow, CDRUSSPACECOM should consider non-DoW, civil, and international requests to review proposed laser illumination above the horizon by ground-, air-, sea-, or space-based lasers and provide necessary notification and coordination services.

(1) A CDRUSSPACECOM-developed prioritization method will be used to ensure resources remain available for DoW Components.

(2) CDRUSSPACECOM will emphasize providing services to non-DoW laser activities corresponding to Category III, followed by Category II, then Category I.

(3) CDRUSSPACECOM will forward all requests to the Joint Staff Director for Operations, J-3 for information purposes.

f. DoW will use a risk management approach to control unintentional laser illumination of RSOs. This approach will:

(1) Support efficient development, acquisition, testing, and fielding of laser systems, including weapon systems. DoW-owned, -operated, or -leased

laser weapon systems must participate in the operational employment decision process IAW reference (e) to ensure that management of laser illuminations of objects in space is considered during the weapon system approval process.

(2) Promote the safe and responsible use of lasers by non-DoW laser owners and operators, as illustrated by this instruction, to balance the benefits to laser and RSO activities.

(3) Implement risk management procedures in Enclosure B.

g. Deliberate laser operations illuminating RSOs—including those for space situational awareness (SSA) and space domain awareness (SDA) purposes—will be reflected in a Master Test and Operations Schedule maintained by CDRUSSPACECOM. These laser operations must be coordinated with CDRUSSPACECOM and approved at the following levels:

(1) Deliberate laser tests illuminating RSOs require Secretary of War (SecWar) approval under the following circumstances:

(a) CDRUSSPACECOM or the Under Secretary of War for Policy (USW(P)) determines the laser activity requires SecWar approval.

(b) Any use of Category III lasers to conduct testing, training, exercising, and maintenance activities designed to illuminate RSOs when:

1. The DoW Component head determines that the activity may have an impact on foreign relations or foreign partners.

2. The activity raises an issue of compliance with arms control treaty obligations or other international legal obligations.

3. The activity requires coordination with other U.S. Government departments and agencies.

4. The activity may result in adverse media coverage.

(2) Secretaries of the Military Departments or Directors of DoW agencies are the approval authority for, and must notify the USW(P) of, laser activities from Category I or II that are:

(a) The first test, series of tests, demonstration, or exercises of a kind that will not cause any of the conditions cited in 4.g.(1)(b) and is

significantly different than historical laser activities.

(b) Use of Category I or II lasers to conduct testing, training, exercising, and maintenance activities of a kind that could reasonably cause any of the conditions cited in 4.g.(1)(b).

(3) RSO owners may approve deliberate laser illumination of their own assets (e.g. routine operations or survivability/reliability testing) that does not meet any of the conditions in 4.g.(1)–(2) and is executed under approved authorities granted to the laser owner/operator at the appropriate level.

(4) Laser illumination for SSA and SDA will be coordinated with CDRUSSPACECOM.

(a) Laser illumination for SSA and SDA may be conducted on RSOs, space launch vehicles, and missiles in boost phase for purposes of detection, tracking, ranging, and imaging subject to the following:

1. Laser illumination for SSA and SDA may be conducted on objects on USSPACECOM's SSA and SDA Lasing Approval List (LAL) on a routine basis, subject to the restrictions contained in this instruction and other applicable authorities, without requesting object owner approval for each illumination.

2. Laser illumination of objects not on USSPACECOM's SSA and SDA LAL may be approved by CDRUSSPACECOM on a case-by-case basis if necessary to mitigate safety of flight risks. In such cases, prior consent of the RSO's owner is not required.

(b) The use of laser illumination for SSA and SDA will follow the same risk assessment process outlined in reference (b) and must not place the space object at undue risk.

1. RSOs with known optical payloads, such as electro-optical imaging, tracking, or laser communications, or with systems that may be impacted (e.g., Global Positioning System Nuclear Detonation Detection System) will not be subject to illumination for SSA and SDA purposes except when deemed necessary by CDRUSSPACECOM.

2. In cases in which it is technically possible, but unlikely, for SSA and SDA laser operations to disrupt, deny, degrade, or destroy an illuminated space object, such as situations requiring improbable chains of

events or extraordinary circumstances, the "reasonable expectation" should be that the illumination will do no harm.

h. DoW-owned, -operated, or -leased laser activities must not be intentionally designed for, or used to cause, permanent blindness in humans, IAW reference (d).

5. Definitions. See Glossary and reference (b).

6. Responsibilities. See Enclosure A.

7. Summary of Changes. This revision incorporates updates in terminology and clarifies the criteria for determining probability of occurrence levels in risk assessment and the risk assessment matrix.

8. Releasability. UNRESTRICTED. This directive is approved for public release; distribution is unlimited on the Non-classified Internet Protocol Router Network. DoW Components (to include the CCMDs) and other Federal agencies may obtain copies of this directive through the Internet from the CJCS Directives Electronic Library at <https://dod365.sharepoint-mil.us/sites/JS-Matrix-DEL/SitePages/Home.aspx>. Joint Staff activities may also obtain access via the SECRET Internet Protocol Router Network Directives Electronic Library web sites.

9. Effective Date. This INSTRUCTION is effective upon signature.

For the Chairman of the Joint Chiefs of Staff:

PAUL C. SPEDERO, Jr., RADM, USN
Vice Director, Joint Staff

Enclosures
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ENCLOSURE A

RESPONSIBILITIES

1. Office of the Secretary of War. All laser requests requiring SecWar approval will be coordinated among the USW(P), DoW Chief Information Officer, USW for Acquisition and Sustainment (A&S), USW for Research and Engineering (R&E), General Counsel of the Department of War, CDRUSSPACECOM, and, as determined necessary, the Assistant Secretary of War (ASD) for Legislative Affairs and the ASD for Public Affairs. USW(P) will lead coordination within the Office of the Secretary of War (OSW). Responsibilities are further delineated in reference (b).

2. Chairman of the Joint Chiefs of Staff

a. The DJ-3 will:

(1) Review and staff all requests for laser illumination tests, series of tests, demonstrations, exercises, and uses of operational and developmental lasers that require SecWar approval. The interagency staffing will include elements of the Joint Staff, Military Services, CCMDs, war agencies, and OSW, where appropriate.

(2) Forward the interagency-staffed request and Joint Staff recommendation through the CJCS to the SecWar for approval/disapproval.

(3) Notify the requesting organization of SecWar approval/disapproval.

(4) Ensure consistency between this instruction and reference (e) to ensure that weapon systems account for the risk of damage to RSOs or mission degradation of RSOs that support DoW missions due to unintentional laser illumination and that systems minimize the risk to the greatest extent practicable.

(5) When notified by CDRUSSPACECOM of a lasing outside authorized parameters (LOAP) event that likely caused harm to RSOs or humans in space, coordinate with USW(P) on notifications and follow-up actions.

(6) Provide oversight of, and revise as necessary, the tailored risk management procedures established in Enclosure B. These procedures will be implemented by CDRUSSPACECOM to reduce the risk of adverse effects due to unintentional laser illumination of RSOs and to ensure DoW-owned, -operated, or -leased laser activities are conducted in a safe and responsible manner.

(7) Coordinate with CDRUSSPACECOM to develop and implement standards to:

(a) Define DoW-owned, -operated, or -leased RSO resiliency requirements for inadvertent laser illuminations.

(b) Enable laser testing, training, and exercising, and maintaining lasers integrated into a DoW weapon system.

(8) Coordinate with CDRUSSPACECOM, USW(P), and other appropriate DoW component heads to develop guidance that encourages safe and responsible laser operations when there is a reasonable expectation that such operations could damage RSO activities covered in reference (b). This guidance will be used with foreign military partners, foreign defense entities, and commercial and civil entities.

b. The Joint Staff Director for Strategy, Plans, and Policy, J-5 will review all laser illumination and testing issues for policy compliance and will coordinate with the appropriate Joint Staff, interagency, and OSW offices (where applicable) on policy issues.

3. Commander, U.S. Space Command

a. IAW reference (f), establish the following processes and procedures to implement all responsibilities formerly assigned to Commander, U.S. Strategic Command in reference (b). These roles and responsibilities can be delegated to an appropriate component.

(1) Establish procedures for deliberate operational and test laser illumination of RSOs IAW section 3.4. of reference (b), to include maintaining a LAL of RSOs that may serve as targets for laser illumination and an SSA and SDA LAL that may serve as targets for SSA and SDA laser illumination. Upon request, provide the LAL or SSA and SDA LAL to relevant DoW component heads.

(2) Determine the disposition of events where a laser activity desires to illuminate a satellite with known optical payloads for SSA and SDA purposes. Case-by-case approval may be based on either coordination with the owner/ operator or a waiver describing the risks and mitigation measures.

4. DoW Component Heads. Implement requirements IAW section 2.4. of reference (b). Additionally:

a. Services and their respective program offices will provide RSO component-level laser vulnerability data, safety of flight assessments, impact severity risk analysis, and mission risk assessments (to include inadvertent lasing) to CDRUSSPACECOM.

b. Services will notify CDRUSSPACECOM within 30 days when RSOs enter service end-of-life for inclusion to the LAL.

c. U.S. Space Force will develop and deploy laser notification, coordination, deconfliction, and modeling software and information technology systems to meet the requirements of reference (b). Provide updates to USW(A&S) every 180 days until deployment is complete.

5. DoW Laser Owners/Operators

a. Register DoW-owned, -leased, or -operated laser activities that intend to direct energy above the horizon or in space with CDRUSSPACECOM for categorization. See Enclosure B.

b. Notify CDRUSSPACECOM before using Category II laser types or conducting Category II activities IAW procedures established by CDRUSSPACECOM, unless the laser activity is waived.

c. Notify and coordinate with CDRUSSPACECOM before using Category III laser types or conducting Category III activities IAW procedures established by CDRUSSPACECOM, unless the laser activity is waived.

d. Notify CDRUSSPACECOM of all LOAP events that propagate energy above the horizon or in space.

6. DoW Satellite Owners/Operators

a. Notify CDRUSSPACECOM of a change in operational status of an RSO (e.g., active to inactive or mission ended).

b. Provide RSO technical information and concept of operations—to include the ability to avoid direct optical payload exposure to known laser sites and current assessment of nominal safety of flight and mission risks—to CDRUSSPACECOM to allow the assessment of laser vulnerability and estimation of potential mission impacts due to laser illumination.

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ENCLOSURE B

RISK MANAGEMENT PROCEDURES

1. This section describes tailored risk management procedures for the laser illumination of RSOs and is consistent with reference (c) and section 3 of reference (b). The procedures include laser activity categorization as well as the assessment and mitigation of risk to RSO activities covered by reference (a) from DoW laser activities. Acceptance of risk standards are discussed in Enclosure C.

2. These procedures will be implemented to reduce the risk of adverse effects due to unintentional laser illumination of RSOs and to ensure DoW-owned, -operated, or -leased laser activities are conducted in a safe and responsible manner.

3. Risk Assessment Process. The following procedure implements the risk management laser system classification process described in section 3.1. of reference (b). The process depicted in figure 1 of reference (b) is reproduced below.

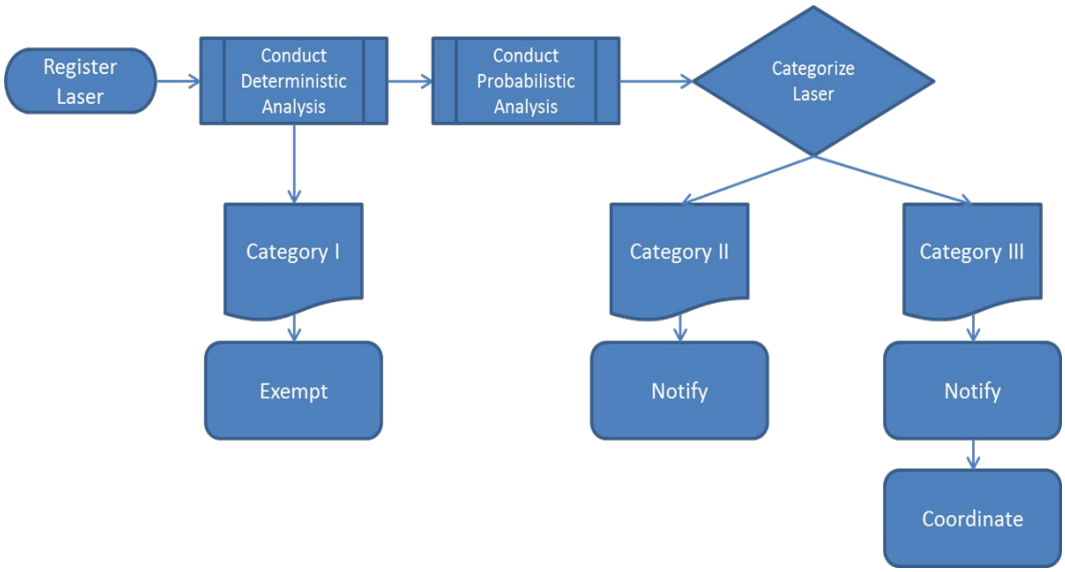

Figure 1. Laser Program Categorization Flow Chart

a. The method consists of a two-layer risk management approach. A deterministic methodology will be used to identify laser activities that do not pose a risk to RSOs. When a hazard does exist, a probabilistic methodology will then be used to determine the level of risk. IAW reference (c), the risk is composed of two elements: the probability of occurrence and the hazard severity.

b. Based on this risk assessment, each laser program will be assigned a Laser Activity Category, using the criteria listed in Table 1. The laser program can coordinate with CDRUSSPACECOM to determine appropriate risk mitigation measures, such as satellite deconfliction, relocation of activities to a Special Use Space Range (SUSR), additional pointing restrictions, etc., if there is a desire to lower the activity category. CDRUSSPACECOM will determine the final Laser Activity Category based upon post-mitigation residual risk, which will determine notification and coordination requirements.

c. Until an approved probabilistic tool is identified and fielded, CDRUSSPACECOM will conduct deterministic analyses to establish laser activity category.

Laser Activity Category	**Analysis Method**	**Level of Risk to RSOs**	**Category Criteria**	**CDRUSSPACECOM Oversight**
I	Deterministic	No risk.	1. Laser activities assessed by deterministic analysis as posing no risk to RSOs. 2. Laser firings that are not directed above the horizon. 3. Hand-held tactical lasers. 4. Operational employment of laser activities, in actual use, that are approved, accepted, and integrated into a DoW "weapon systems" as defined by the DoW Dictionary for Military and Associated Terms, including laser weapons approved for operational use.	Exempt from further coordination with or notification to CDRUSSPACECOM.
II	Probabilistic	No greater than other nominal safety of flight and mission risks.	1. Laser activities conducted from a defined location, assessed to pose a risk to RSO activities no greater than other nominal safety of flight and mission risks. 2. Testing, training, exercising, and maintenance of laser activities conducted within the constraints of a Special Use Space Range.	Notification to CDRUSSPACECOM required before laser activity, but do not require further coordination unless deliberately targeting an RSO.
III	Probabilistic	Greater than other nominal safety of flight and mission risks.	1. Planned testing, training, exercising, and maintenance of lasers that are approved, accepted, and integrated into a DoW weapon system that have been accessed to pose a risk to RSOs greater than other nominal safety of fight and mission risks. Includes laser weapons approved for operational use. 2. Laser activities assessed to pose a risk to RSOs greater than other nominal safety of flight and mission risks. 3. Laser activities assessed to pose a risk to RSOs no greater than nominal safety of flight and mission risks but not conducted from a defined location.	CDRUSSPACECOM notification and coordination before use.

Table 1. Criteria for Assigning Laser Programs to Laser Activity Categories

4. Procedure for Laser Activity Assessment. The following procedure implements the risk management process.

a. All DoW-owned, -operated, or -leased laser programs that intend to direct energy above the horizon or in space must register with CDRUSSPACECOM for purposes of participation in the risk assessment process.

(1) Registration will include basic system parameters and concepts of operations. Laser information may include laser type, wavelength, power, beam characteristics such as divergence, and other relevant factors. In addition, concepts of operations will be described with information such as typical target, location, mission, firing fields of view, notional target trajectories, laser movement, number of tests, duration of testing, and other related factors.

(2) Registration data requirements and forms for data submission will be defined by CDRUSSPACECOM.

b. CDRUSSPACECOM will conduct a deterministic assessment to identify lasers that are assigned to Risk Category I. The criteria for being assigned to Category I are listed in Table 1. Programs in this category are exempt from further interaction with CDRUSSPACECOM (must be reviewed every other year).

(1) CDRUSSPACECOM will coordinate with USW(A&S), USW(R&E), and the Military Departments to establish requirements for risk modeling software and information systems that perform deterministic modeling of the interactions between laser activities and RSOs. The software and information systems will be developed by the Military Departments in coordination with USW(A&S), USW(R&E), and USW for Intelligence and Security (I&S). The software and information systems will include databases of all satellites, their components, and the susceptibility of each component to laser illumination. The database will be validated and updated regularly by intelligence analysts and satellite component subject matter experts.

(2) Following are the guidelines for CDRUSSPACECOM to conduct a deterministic assessment using the software and information systems discussed in 4.b.(1).

(a) Laser registration parameters will be used to calculate the laser energy.

(b) The registered laser location will be used for fixed site (not movable or transportable) systems. Worst-case location will be used for a movable or transportable laser or a laser program with multiple systems.

(c) Laser propagation through the atmosphere (or other environments such as water) will assume conservative atmospheric absorption, transmission, and other related properties based on existing validated databases and tools. Alternately, atmospheric propagation adjustments may be made based on the fixed laser location or worst-case location assumption in 4.b.(2)(b) using approved transmission values.

(d) The effects on the RSO will be computed using suitably conservative assumptions. These assumptions will include hazard thresholds based on an RSO with a sensitive optical imaging system that is in-band to the laser and observing the laser in its field of view at the time of inadvertent illumination. The hazard thresholds will be established by CDRUSSPACECOM in conjunction with DoW-owned, -operated, or -leased RSO owners from DoW Components, Military Departments, the National Reconnaissance Office (NRO), and intelligence analysts. The thresholds will be defined in terms of laser energy intensity at the RSO (typically in watts per steradian (W/sr) or Watts per square meter (W/m^2)).

(e) The laser system concept of operations will be used to define a conservative value for the maximum duration that the satellite could be inadvertently illuminated by a laser firing. A “reasonable expectation” standard will be established based on the laser’s concept of operations, including beam pointing restrictions, beam divergence, laser range of movement, and similar factors.

(f) Based on the deterministic assessment of potential hazards, CDRUSSPACECOM will assign Category I status to the laser program or refer the program for probabilistic analysis. Laser programs receiving Category I status will be notified in writing.

5. CDRUSSPACECOM will conduct a probabilistic assessment on all lasers not assigned to Risk Category I as defined in Table 1. Upon completion of the probabilistic assessment, all non-Category I lasers will be binned as Category II or Category III. Programs binned in Category II will notify CDRUSSPACECOM prior to conducting the laser activity, and lasers binned in Category III will notify and coordinate with CDRUSSPACECOM prior to conducting the laser activity.

a. CDRUSSPACECOM will coordinate with USW(A&S), USW(R&E), and the Military Departments to establish requirements for risk modeling software and

information systems that perform probabilistic modeling of the interactions between laser activities and RSOs as well as software and systems that ensure effective coordination between laser programs and CDRUSSPACECOM and coordination with satellite owners. The software and information systems will include databases of all satellites and their components, and the susceptibility of each component to laser illumination. The database will be validated and updated regularly. For cases where susceptibility information is not available, CDRUSSPACECOM may apply best technical judgments to define the missing data. Prior to initial use or tool changes and upgrades, CDRUSSPACECOM will coordinate with the NRO Director, relevant DoW Component heads, and other applicable non-DoW stakeholders.

(1) A probabilistic analysis is a quantitative analysis using probabilistic distributions to estimate the effect on RSOs by specific laser systems or activities.

(2) Risk assessments will be tailored to the circumstances of each laser program. One probabilistic analysis may suffice for a laser program with a single laser at a known location with defined set of targets and concept of operations. Multiple analyses may be needed for a laser program with multiple laser systems, a variety of potential locations, or multiple lasers that are part of a single system or diverse targets/concepts of operations. In this case, a laser program may be assigned to one category initially, but then transition to a different category or different risk mitigation approach as the program evolves and the concept of operations changes.

b. The following are the guidelines for CDRUSSPACECOM to conduct a probabilistic risk assessment using the software and information systems discussed in 5.a.

(1) Laser registration parameters will be used to calculate the laser energy.

(2) The registered laser location will be used. At the discretion of CDRUSSPACECOM, a probabilistic analysis may be repeated multiple times for the same system but varying the location identified in the registration, target set, or concept of operations.

(3) Laser propagation through the atmosphere (or other environments such as water) will use atmospheric propagation adjustments. Validated military-related databases of environmental characteristics will be used (e.g., standard transmission tables). The atmospheric characteristics (e.g., probability of a cloud-free line of sight and atmospheric optical turbulence)

may be used for the fixed laser location or worst-case location assumption in 5.b.(2).

(4) The probabilistic analysis will consider the effects of potential laser illumination on all currently active satellites plus a reasonable projection into the future of the active satellite constellation. The constellation of satellites to be used for the probabilistic analysis will be defined by CDRUSSPACECOM. Multiple parameters—such as instantaneous field of view, field of regard, laser susceptibility, ephemeris, and concept of operations—will be established for each satellite in the constellation.

(5) The laser system mission, concept of operations, and anticipated target set will be used to model laser activities over a period of time. The model should include the likely laser location, pointing directions, duration of each firing, and number of firings over the time period. As an option, the analysis may include the impacts of a validated estimate of the laser energy absorbed by the target and not propagated into space. CDRUSSPACECOM will define the time period for analysis based on the laser mission, concept of operations, and life of the system. CDRUSSPACECOM will also define the number of laser systems to be used in the analysis (if the program will produce multiple systems).

(6) CDRUSSPACECOM will use the probabilistic risk assessment software or information technology tools provided in section 5.a. above to compute the likelihood of exceeding a specified damage threshold for the satellite constellation of interest due to inadvertent laser illumination over the defined period.

(a) The risk assessment approach will screen the potential illuminations to determine whether a hazard existed for each instance. The database of satellite susceptibility parameters described in section 5.a. will be used to assess whether the damage threshold for any component was exceeded based on the probabilistic duration that the satellite was inadvertently illuminated by a laser firing.

(b) The threshold will be defined in terms of laser energy intensity at the RSO (typically in W/sr or W/m^2). CDRUSSPACECOM will define the specific application of susceptibility variables, which may include satellite field of view, field of regard, or satellite sensor wavelength band. A “reasonable expectation” standard will be established based on the satellite’s susceptibility data and the laser’s concept of operations, including beam pointing restrictions, beam divergence, laser range of movement, and similar factors.

The result will be a quantitative value that estimates the likelihood of damage to each satellite over the defined time period.

(c) Based on the likelihood of damage estimates, the tools provided in paragraph 5.a. above will calculate the overall risk to the RSO.

(7) The quantitative results of the probabilistic assessment will be applied to the following table to determine the Probability of Occurrence Level IAW reference (c). In each case, the probabilities are scaled to a two-year time horizon (if the analysis is repeated biennially) or one-year time horizon (if the laser system will be used less than one year).

Category	Associated Probability (P) (chance of occurring at least once in two years)
Certain	1
Probable	$1 \times 10^{-2} \leq P < 1$
Improbable	$1 \times 10^{-4} \leq P < 1 \times 10^{-2}$
Highly Unlikely	$1 \times 10^{-6} \leq P < 1 \times 10^{-4}$
Eliminated	$P < 1 \times 10^{-6}$

Table 2. Criteria for Determining Probability of Occurrence Levels in Risk Assessment

(8) CDRUSSPACECOM will use the probabilistic risk assessment software or information technology tools provided in paragraph 5.a. to compute mission impact to the satellite constellation RSO over the defined period. Once the mission impact is determined, the laser system will be binned into the following severity categories:

(a) Extreme Harm – complete permanent loss of mission capability.

(b) Major Harm – significant permanent degradation of mission capability.

(c) Moderate Harm – minor degradation or temporary loss of mission capability.

(d) Minor Harm – partial/temporary loss.

(9) The Risk Assessment is performed by applying the Probability of Occurrence (determined in 5.b.(7) and the Severity Category (IAW 5.b.(8)) to the Risk Assessment Matrix in Table 3. The result is an assessed risk for each satellite in the satellite constellation of High, Significant, Moderate, or Low.

SEVERITY / PROBABILITY OF DAMAGE	Minor Harm	Moderate Harm	Major Harm	Extreme Harm
Very Likely	MODERATE	SIGNIFICANT	HIGH	HIGH
Probable	LOW	SIGNIFICANT	SIGNIFICANT	HIGH
Improbable	LOW	MODERATE	SIGNIFICANT	SIGNIFICANT
Highly Unlikely	LOW	LOW	MODERATE	SIGNIFICANT
Eliminated				

CATEGORY III
CATEGORY II
CATEGORY I

Table 3. Risk Assessment Matrix

(10) The overall assessed risk, based on a statistical analysis of RSO risk assessments, is correlated to the Laser Hazard Category outlined in section 3.a. of reference (b). The High and Significant levels of risk correspond to Category III; the Moderate and Low level of risk correspond to Category II. Exceptions may be approved by CDRUSSPACECOM on a case-by-case basis.

(11) At the conclusion of the probabilistic risk assessment, CDRUSSPACECOM will provide a memo to the laser program documenting the assigned hazard category, rationale for the decision, and risk mitigation steps taken, which include deconfliction requirements for a Category III laser system or the movement of a Category III activity to a SUSR to reduce it to a Category II activity.

ENCLOSURE C

ACCEPTANCE OF RISK

1. Risk acceptance is a risk handling option exercised by an official with appropriate authority who acknowledges that the risk event or condition may be realized and willingly accepts the risk with its consequences.

2. For the management of risks defined in this instruction, acceptance of risk refers to the residual risk to RSO activities covered by reference (a) from inadvertent laser illuminations.

3. Risk Acceptance

a. Category I Risk Acceptance. In each case, the Category I risk is accepted by CDRUSSPACECOM upon determination that at least one of the criteria in Table 1 has been met.

b. Category II Risk Acceptance. See Table 1. The risk mitigation for Category II activities is laser owner notification to CDRUSSPACECOM prior to the laser firing. Other possible risk mitigation actions include mission assurance and resilience measures taken by DoW-owned, -operated, or -leased RSO activities consistent with reference (g). The Category II risk acceptance decision will be made by CDRUSSPACECOM. The risk acceptance authority may not be delegated below the general/flag officer level.

c. Category III Risk Acceptance. See Table 1.

(1) The risk mitigation for Category III activities is laser owner notification to, and coordination with, CDRUSSPACECOM prior to the laser firing. Coordination services are a process by which CDRUSSPACECOM balances laser and satellite mission requirements to mitigate potential hazards and maximize joint force capability. Coordination may include deconfliction, a procedure that governs the firing of a laser that may intentionally or inadvertently illuminate RSOs. Deconfliction may be conducted using centralized, decentralized, or other approved methods. CDRUSSPACECOM will provide timely and accurate data to support deconfliction for Category III laser activities. Other risk mitigation actions include mission assurance and resilience measures taken by DoW RSO activities consistent with reference (g).

(2) CDRUSSPACECOM will make the Category III risk acceptance decision, with the coordination requirements outlined in reference (a). The risk acceptance authority may not be delegated below the general officer/flag officer level.

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ENCLOSURE D

LASER PROCEDURES

1. Subject to the restrictions contained herein, as well as in reference (b) and other applicable authorities, lasers may be used to illuminate approved RSOs and space launch vehicles and missiles in boost phase for SSA and SDA without coordination with the RSO's owner and operator. Laser illumination for SSA and SDA includes the detection, tracking, ranging, and imaging of the objects(s) of interest. Following are the procedures for using lasers for SSA and SDA purposes, consistent with section 3 of reference (b). These procedures are applicable to Category I, II, and III lasers.

2. This guidance covers the use of both operational and research, development, test, and evaluation lasers to produce operational SSA and SDA data and seeks to ensure that SSA and SDA data will be made available to Combatant Commanders and other appropriate senior U.S. Government personnel.

a. The SDA LAL will include rocket bodies and debris and active-, inactive-, and mission ended-RSOs.

b. CDRUSSPACECOM will approve lasers prior to conducting SSA and SDA operations.

(1) Category I, II, and III lasers will operate IAW sections 3.1.a. and 3.4. of reference (b).

(2) Category III lasers will use the software and information technology tools described in section 2.2.c.2 of reference (b) if deconfliction is required.

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ENCLOSURE E

REFERENCES

a. DoDD 3100.10 change 1, 15 October 2025, “Space Policy”

b. DoDI 3100.11, 24 October 2016, “Management of Illumination of Objects in Space”

c. CJCSM 3105.01B, 22 December 2023, “Joint Risk Analysis Methodology”

d. SecDef memo, 17 January 1997, “DoD Policy on Blinding Lasers”

e. CJCSM 3230.01B, 4 September 2025, “(U) Directed Energy Weapon Initial Operational Employment Review and Approval Process”

f. SecDef memo, 18 December 2018, “Establishment of U. S. Space Command”

g. DoDI 3020.26, 4 June 2024, “Department of Defense Continuity Policy”

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GLOSSARY

PART I – ABBREVIATIONS AND ACRONYMS

ASD	Assistant Secretary of War
CCMD	Combatant Command
CDRUSSPACECOM	Commander, U.S. Space Command
CJCS	Chairman of the Joint Chiefs of Staff
DoW	Department of War
IAW	in accordance with
LAL	Lasing Approval List
LOAP	lasing outside authorized parameters
NRO	National Reconnaissance Office
OSW	Office of the Secretary of War
RSO	resident space object
SDA	space domain awareness
SSA	space situational awareness
SUSR	Special Use Space Range
USW(A&S)	Under Secretary of War for Acquisition and Sustainment
USW(I&S)	Under Secretary of War for Intelligence and Security
USW(P)	Under Secretary of War for Policy
USW(R&E)	Under Secretary of War for Research and Engineering
USSPACECOM	U.S. Space Command

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PART II – DEFINITIONS

above-the-horizon. Direct laser energy that is not terminated by land, water, or other terrestrial backstop.

coordination services. A process by which Commander, U.S. Space Command balances laser and satellite mission requirements to mitigate potential hazards and maximize joint force capability.

deconfliction. A procedure that governs the firing of a laser that may intentionally or inadvertently illuminate resident space objects. The procedure may be conducted using a centralized, decentralized, or other approved method.

deterministic analysis. A quantitative analysis of the effect on resident space object (RSOs) by a specific laser system or activity when the laser is modeled as illuminating the RSOs. The analysis will utilize simplifying and conservative assumptions.

DoW laser activities. Laser activities receiving resources, manpower, or funding from a Department of War (DoW) department or agency for research, development, test, and evaluation purposes, or for operational employment purposes after integration into DoW weapon systems. This includes DoW or DoW-sponsored laser research, development, developmental test, operational test, evaluation, exercise, and routine operational activity that is funded by, operated under the auspices of, or conducted by DoW, with the potential to adversely affect a resident space object or humans in space.

DoW-owned, -operated or -leased resident space object activities. Resident space object (RSO) activities receiving resources, manpower, or funding from a Department of War (DoW) department or agency, including leased space services when appropriate. This also includes DoW or DoW-sponsored RSO research, development, acquisition, and operations.

illumination. A laser light incident on the surface of an intentional or unintentional target.

laser. Devices that emit coherent electromagnetic radiation of wavelengths between 10nm and 1mm, developed through a process of stimulated emission.

Lasing Approval List. A list of satellites that may serve as targets for laser activities such as ranging, tracking, calibration, and imaging.

lasing outside authorized parameters. Any deviation from Commander, U.S. Space Command-approved lasing parameters that results in laser energy being directed above-the-horizon or in space that was not deconflicted.

notification services. A process by which Commander, U.S. Space Command (CDRUSSPACECOM) compiles and distributes information provided by laser owners and operators to CDRUSSPACECOM about upcoming laser activities to satellite owners and operators, and satellite owners and operators are provided the opportunity to adjust mission parameters to mitigate potential risks.

operational employment. The tactical use of laser capabilities for offensive or defensive purposes after the laser has been integrated into Department of War (DoW) weapon systems or other laser-based capabilities that enable DoW operations. Operational employment of laser capabilities will also adhere to applicable rules of engagement and execution orders.

probabilistic analysis. A quantitative analysis using probabilistic distributions to estimate the effect on resident space objects by specific laser systems or activities.

probabilistic risk analysis. An analysis to estimate risk by computing real numbers to determine what could go wrong, how likely it is that something will go wrong, and what the consequences would be if something did go wrong. Specific to this issuance, probabilistic risk analysis is a quantitative analysis of the potential illumination of, and effect on, resident space objects by specific laser systems or activities. The analysis will utilize reasonable expectation standards and a probabilistic approach. Laser categorization and subsequent risk reduction measures will be based on this assessment.

risk acceptance. A risk handling option exercised by an official with appropriate authority who acknowledges that the risk event or condition may be realized and willingly accepts the risk with its consequences.

risk management. A method that enables informed decisions about laser illumination above the horizon or in space to accept, reduce, or offset risk, and subsequently make decisions that weigh overall risk against mission benefits, and which includes identification of mitigation measures that can be taken to reduce risks.

resident space object. A manufactured object intended to orbit the earth, the moon, or another celestial body (e.g., spacecraft) or an object that remains in orbit as a result of that intent (e.g., rocket bodies debris, whether functioning or non-functioning).

resilience. The ability to prepare for and adapt to changing conditions and recover rapidly from operational disruptions. Resilience includes the ability to withstand and recover from deliberate attacks, accidents, or naturally occurring threats or incidents.

safe and responsible operations. Procedures undertaken, using the reasonable expectation standard, to protect space objects from harm by either intentional or unintentional laser illumination.

special use space range. A specified three-dimensional region defined in earth coordinates during a specified time period in which Department of War-owned, -operated, or -leased laser operations will occur. Notification of satellite owners and operators of these parameters will allow operational tactics to minimize risk.

survivability. A property of a system, subsystem, equipment, process, or procedure that provides a defined degree of assurance that the named entity will continue to function during and after a natural or man-made disturbance, e.g., laser energy. Note: For a given application, survivability must be qualified by specifying the range of conditions over which the entity will survive, the minimum acceptable level or post-disturbance functionality, and the maximum acceptable outage duration.

unintentional illumination. Non-deliberate illumination of an object by a laser beam.

waiver. A determination made and documented by Commander, U.S. Space Command to authorize a laser owner or operator to conduct a specific laser activity without the need for further coordination, notification, or risk mitigation measures for a specific period of time in accordance with reference (b).

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