UNCLASSIFIED

STANDARD CENTRALIZED DECONFLICTION AND CAPABILITY VALIDATION PLAN

Change 3

Revision A
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SUMMARY OF CHANGES

Initial approval	*Standard Centralized Deconfliction and Capability Validation Plan for Laser Clearinghouse Support to Lasers* and *Standard Centralized Deconfliction and Capability Validation Plan for Space Control Center Support to Lasers*, both dated 14 April 2005 and signed by Joint Functional Component Command for Space and Global Strike/J35.
Change 1	Consolidated Laser Clearinghouse and Space Control Center standardized plans into one document with common systems and procedures for both organizations. Modified document to reflect the LCH "Spiral 3" Deconfliction System that was fielded in 2006. Updated organizational names and locations as necessary.
Change 2	Replaced J95 with Unified Space Vault and replaced Joint Space Operations Center (JSpOC) Space Situational Awareness (SSA) Ops with Combat Operations Division (COD) Senior Awareness Duty Technician (SADT). Updated LCH and COD contact information. Updated Interface Control Document to version LP 14-1. Added information about Space-track.org. Updated verbiage to clarify 30-day lookout requirement.
Change 3	Replaced Unified Space Vault with Laser Clearinghouse. Replaced SADT with Awareness Duty Operator (ADO). Replaced term "Predictive Avoidance" with "Deconfliction." Updated reference DoDI 3100.11.

SECTION 1: INTRODUCTION

1.1. PURPOSE & SCOPE.

a. This deconfliction plan defines a standard approach to the centralized deconfliction process. It is applicable for any laser system receiving centralized deconfliction support from the Laser Clearinghouse (LCH) or Combat Operations Division (COD) Awareness Duty Operator (ADO). Centralized deconfliction is defined as the process by which a laser system receives *all* required deconfliction products from JFCC SPACE. Centralized deconfliction plans will be tailored to the extent necessary for each laser in a system-specific appendix to this standard plan.

b. This document describes the responsibilities of the LCH, the ADO and the laser owner to work together to provide safe and responsible laser activities as required by Department of Defense (DoD) Instruction (DoDI) 3100.11.[1] This document identifies the systems, processes, interactions, and schedules to be followed so that an end-to-end deconfliction solution is available to support each centralized laser program.

1.2. BACKGROUND.

a. DoD policy requires that all DoD laser activities be conducted in a safe and responsible manner, consistent with national security requirements, in order to manage the associated risks to space systems, their mission effectiveness, and humans in space. DoDI 3100.11 also mandates that all DoD laser activities be coordinated with U.S. Strategic Command for risk management assessment. One of the risk mitigation approaches is deconfliction with U.S., friendly, and other space operations. Joint Chiefs of Staff Instruction (CJCSI) 3225.01 and Strategic Command Instruction (SI) 534-12 implement this policy and prescribe procedures for risk management, including deconfliction.

b. Implementation of this mission has been assigned to U.S. Strategic Command and delegated to JFCC SPACE in accordance with SI 534-12; LCH is a subordinate unit.

1.3. PLAN MAINTENANCE.

a. This plan will be periodically updated as necessary to reflect new or evolving policies and procedures.

b. Substantive (non-administrative) changes to the plan will be fully coordinated among all affected stakeholder organizations.

[1] DoD Instruction 3100.11, "Illumination of Objects in Space by Lasers", 24 October 2016.

SECTION 2: DECONFLICTION RESPONSIBILITIES

2.1. JOINT FUNCTIONAL COMPONENT COMMAND FOR SPACE.

a. Develop, in coordination with stakeholders, this standard centralized deconfliction and capability validation plan.

b. Provide final approval for laser firing based on deconfliction capability validation results.

c. Operate the LCH Space Deconfliction System in support of centralized laser activities.

d. Coordinate with affected agencies to ensure satellite protection methods are implemented.

e. Develop, in coordination with laser owners, laser-specific appendices to this Plan.

f. Approve and sign the laser specific appendix to this Standard Deconfliction Plan.

g. Review and analyze the deconfliction capability validation results.

h. Participate in deconfliction capability validation testing.

i. Receive satellite authorization letters and update the Lasing Approval List (LAL).

j. Report unauthorized laser firings identified by the laser operator to the USSTRATCOM Global Operations Center (GOC), in coordination with the JSpOC Senior Space Duty Officer.

k. Support laser programs in necessary efforts to mitigate their risks of inadvertently illuminating unauthorized satellites. Should a laser site fire outside of Deconfliction measures, collect and track the site's remedial actions to prevent future occurrences.

2.2. LASER OWNER/OPERATOR.

a. Participate in the development and coordination of the laser-specific appendix to this plan.

b. Approve and co-sign the laser-specific appendix to this plan.

c. Participate in centralized capability validation by providing technical information, test results, and certification statements to the LCH. This validation culminates with the execution of an end-to-end demonstration.

d. Provide laser test plans and procedures, and schedules to LCH at least 30 days prior to the planned start date of operations.

e. Provide target satellite identification numbers and satellite permission letters (as required) to the LCH. Satellite permission letters must be on file with the LCH no later than 10 days prior to the applicable laser activity.

f. Notify the LCH of any changes to the laser hardware, software, or operational procedures that may affect any active deconfliction validation and authorization.

g. Incorporate required deconfliction capabilities into the laser system operational concepts and requirements documents.

h. Report all lasing outside of authorized parameters events to LCH that propagate energy above the horizon or in space as discussed in section 5.3.d.

SECTION 3: GENERAL DESCRIPTION OF SYSTEMS AND ORGANIZATIONS

3.1. LASER SYSTEM DESCRIPTION.

a. Appendix A to this plan contains a description of the laser program, the objectives of the laser firings, laser parameters, deconfliction requirements, details of typical scenarios, and schedules.

b. Appendix A will also include system-specific descriptions of the scenarios used in laser activities, to include scenario goals, geometries, the laser engagement process, and safety procedures.

3.2. LASER CLEARINGHOUSE AND AWARENESS DUTY OPERATOR OVERVIEW.

a. Commander, JFCC SPACE is responsible for the laser Deconfliction mission in accordance with DoD Instruction 3100.11 and U.S. Strategic Command Instruction 534-12. Specific LCH responsibilities are further assigned to the JFCC SPACE/J39 division, in which the LCH resides.

b. Air Force Space Command's 614th Air and Space Operations Center (AOC) provides manning, training, and equipment to the Joint Space Operations Center (JSpOC) which provides the LCH satellite data, deconfliction support, and timely notification of space events, such as satellite launches and maneuvers. Upon evaluation of the laser and support needed, the LCH may task the ADO to provide deconfliction to selected laser programs. The ADO is a 24/7 position on the JSpOC operations floor, and resides within the Combat Operations Division of the JSpOC.

c. The LCH performs the following functions:

(1) Reviews all proposed laser illuminations above the horizon or in space.

(2) Provides deconfliction and safe laser operating parameters.

(3) Coordinates with satellite owners/operators and mission partners.

(4) Reports all laser firings conducted outside authorized parameters (when notified).

d. LCH uses the Space Deconfliction System (DECON) to perform analysis for the deconfliction process. This system generates protect lists, computes open firing windows, analyzes satellite susceptibility to lasers, and conducts post-mission analysis of laser activity. The ADO also has DECON that performs the same functions as the LCH system and is used to perform deconfliction tasks for specified laser systems.

SECTION 4: LASER DECONFLICTION PLANNING PROCESS

4.1. The laser Deconfliction planning process consists of six steps:

Step 1: Registration of the Laser.
Step 2: Evaluation of the Laser's Potential to Harm Satellites (risk assessment).
Step 3: Analysis of Deconfliction Approaches.
Step 4: Planning Implementation of the Deconfliction Approach.
Step 5: Deconfliction Capability Validation.
Step 6: Authorization of the Laser Activity.

4.2. The first step is *Registration of the Laser*. The laser owner provides LCH with the technical parameters concerning their laser's fluence or irradiance.

4.3. The second step is *Evaluation of the Laser's Potential to Harm Satellites (risk assessment).* In this step, the laser is assessed in a waiver determination process and is based on the potential to inadvertently affect satellites. This determines whether deconfliction is required.

4.4. The third step is *Analysis of Deconfliction Approaches*. LCH and the laser owner jointly perform an analysis on the most suitable deconfliction approach: Centralized where JFCC SPACE provides all deconfliction; Decentralized where the laser owner generates all deconfliction with data provided by LCH; and Hybrid where JFCC SPACE provides a portion of the deconfliction and the laser owner generates the remaining deconfliction.

4.5. The fourth step is *Planning Implementation of the Deconfliction Approach.* Section 4 of this document describes the deconfliction tasks and actions to be accomplished by LCH, the ADO, and the Laser Owner.

4.6. The fifth step is *Deconfliction Capability Validation*. Section 8 of this document (Deconfliction Capability Validation Process) defines the means by which the deconfliction process will be tested and analyzed.

4.7 The sixth and final step is *Authorization of the Laser Activity*. Commander, JFCC SPACE or his designee will issue authorization for the laser activity employing Centralized deconfliction.

SECTION 5: PROCEDURES FOR CENTRALIZED DECONFLICTION

The following sections describe standardized procedures for deconfliction planning, pre-Activity activities, real-time operations, and post-Activity actions.

5.1. DECONFLICTION PLANNING.

a. The Laser Owner must comply with the following calendar and Interface Exchange Requirements (IERs) for deconfliction planning. The IERs are described in more detail in Section 6.

(1) Monthly, the laser operator will provide LCH with the dates and times for laser firings and scenarios for up to 12 months in advance (IER #1). Inputs are provided on the Master Test and Operations Schedule (MTOS) Input Form. Coordinate with LCH on deconfliction runs to be performed, method of transmission of safe firing windows, frequency and timing of support plus points of contact (phone, fax and e-mail).

(2) No later than three calendar days prior to the start of laser activity, the laser owner will transmit a deconfliction request message in accordance with IER #2.

b. As part of deconfliction planning, LCH maintains and updates the Master Protect List (MPL) of satellites. The MPL includes all satellites that are potentially susceptible to laser emissions.

c. A laser program may benefit from the incorporation of satellite susceptibility during the deconfliction process. If so, the LCH will need to "normalize" the laser. Normalization of a laser consists of an additional assessment by the Air Force Research Laboratory (AFRL) Satellite Assessment Center (SatAC) to ensure laser parameters are calculated using consistent equations and assumptions as those used for developing the satellite susceptibility database provided by SatAC. The application of susceptibility has the potential to increase the frequency and duration of open firing windows, depending on the PRM. SatAC's support to the deconfliction planning process will be in accordance with established agreements.[2] The decision to normalize a laser will usually be made during the registration process.

d. The Laser Owner/Operator (LO/O) will post PRMs in their respective PRM folder on www.space-track.org. LCH can utilize other methods for coordination for PRMs (i.e. higher classification), however www.space-track.org is the preferred method of coordination.

e. Table 1 summarizes the tasks performed during Deconfliction Planning. Details of IERs may be found in Section 6.

[2] Memorandum of Agreement between JFCC SPACE and AFRL Satellite Assessment Center for Satellite Susceptibility Analysis, 9 August 2012.

Table 1 - Deconfliction Planning Tasks.

Task	OPR	Description	Implementation
1.1	Laser Owner	Determine dates and times to be requested; identify lasers to be used and scenario.	Laser owner's internal planning procedures. Submit Master Test and Operations Schedule inputs monthly per IER #1 in Table 5.
1.2	Laser Owner	Identify target or laser firing geometry; define target trajectory and uncertainties.	The targets will be identified by satellite identification numbers, stars, planets, or boxes/points in space or other means. Valid satellite targets must be on the LAL maintained by LCH or the laser owner must provide letters of permission from the satellite owner.
1.3	Laser Owner	Provide Program Request Message (PRM) to LCH.	The PRM includes data generated in Tasks 1.1-1.2 and conforms to formats specified in the DECON ICD. PRMs should be transferred via www.space-track.org, unless otherwise coordinated with LCH for alternate means. See IER #2 in Table 5.
1.4	LCH	Maintain MPL.	LCH updates the MPL based on current satellite activity such as new launches and satellite decays.

5.2. PRE-ACTIVITY DECONFLICTION TASKS.

a. The LCH or ADO will use DECON to compute open windows to determine when the laser activity may be conducted safely. The open windows will be based on the most current General Perturbation (GP) element sets in the database. Deconfliction processing may use the MPL or the laser-specific UPL.

b. The open windows will be provided on a schedule established in the Deconfliction Planning step above. The LCH requires approximately 24 hours to generate the open windows. The results are sent in the Program Approval Message (PAM); see IER #3 described in Section 6. The laser owner will determine if the open windows are sufficient to achieve laser activity objectives. If not, the laser owner may request assistance from the LCH in determining if there is a modification to the scenario that would improve the open firing times.

c. For PAMs that are posted to www.space-track.org, the LO/O must request access through the www.space-track.org homepage for approval by the website's admin. Questions about www.space-track org access can be addressed by e-mailing admin@space-track.org. Table 2 summarizes the tasks performed during pre-Activity deconfliction tasks.

Table 2 - Pre-Activity Deconfliction Tasks.

Task	OPR	Description	Implementation
2.1	LCH or ADO	Compute PAM based on PRM.	LCH or the ADO will double-check the laser site location for correctness, paying specific attention to potential +/- and E/W Longitude errors. Open windows will be calculated using DECON. The MPL will be used as the satellite protect list with Deconfliction Susceptibility Sub-Routine. GP element sets will be used for ephemeris. A default keep-out-cone half angle of 2.5 degrees will be used along with AFSPC-approved auto-coning capability unless analysis of laser system parameters justifies a smaller value.
2.2	LCH or ADO	Transmit PAM.	The PAM containing the safe firing windows will be downloaded from DECON, reviewed for security considerations, and posted to the space-track.org website or agreed upon method. See IER #3 in Table 5. The PAM will conform to the DECON ICD.
2.3	Laser Owner	Determine if open windows are sufficient to support laser activity objectives.	The open windows will be compared with laser activity objectives to determine the adequacy of firing opportunities. If inadequate, dialogue with LCH will be initiated to identify alternatives.

5.3. REAL-TIME LASER OPERATIONS.

a. The laser operator will conduct the laser activity within the open firing windows provided in the PAM. Laser firings must be performed within the laser and scenario parameters defined in Task 1.3. The PAM provided in Task 2.2 will be used by the laser system to restrict laser firings as described in the laser-specific Appendix A.

b. At T-1 hour for each day of a laser activity, the laser operator will contact LCH or the ADO and notify them of the laser status and that laser firings are about to begin. This activity also verifies communications between the laser site and LCH or the ADO. (See IER #4 in Table 5 for details.)

c. At T-0 and during the laser firings, the laser system will record all information needed for post-firing reports. During the course of the laser firing, if a satellite maneuvers or if a satellite is launched, LCH or the ADO will notify the laser operator as soon as possible, and the laser firing will be stopped until further analysis is accomplished. LCH or the ADO will provide the laser operator with revised open firing windows, if necessary.

d. Within 15 minutes of completion of laser firings, the laser operator will send a Quick Look Report to LCH or the ADO. See IER #6 in Table 5 for details. In the event of a laser firing outside authorized parameters (LOAP), the laser operator will verbally provide a LOAP Notification to LCH within 15 minutes of the event, and provide a follow-up written report within 12 hours. See IERs #7 and 8 in Table 5.

e. Table 3 contains the detailed description of the tasks that will be performed during real-time laser operations.

Table 3 - Real-Time Laser Operations Tasks.

Task	OPR	Description	Implementation
3.1	Laser Operator	Disseminate PAM for operator use.	Open firing windows must be available to system operators.
3.2	Laser Operator	Communication check and Laser Status Report.	One hour prior to beginning the laser firing, the laser operator will contact LCH or the ADO. The laser operator will verify communication systems are available, relay the status of the laser, and notify that the laser firing is about to begin. The laser operator will also inquire if any space events are in progress. See IER #4 in Table 5.
3.3	LCH or ADO	Space Event Notification.	When a space event occurs, the laser activity may be halted until clearance from LCH or the ADO is received. Updated satellite ephemeris will be used to calculate new open windows and transmit them to the laser operator if necessary. See IER #5 in Table 5.
3.4	Laser Operator	Perform laser system processing of open windows to ensure a safe firing.	See Appendix A.
3.5	Laser Operator	Monitor laser beam and target position during engagement.	See Appendix A.
3.6	Laser Operator	Abort/terminate laser firing if laser exceeds deconfliction spatial or temporal parameters.	See Appendix A.
3.7	Laser Operator	Record laser firing data for post analysis.	See Appendix A.
3.8	Laser Operator	Monitor status during engagement.	See Appendix A.
3.9	Laser Operator	Quick Look Report.	Report from the laser operator to LCH or the ADO within 15 minutes of completion of a laser activity. See IER #6 in Table 5.
3.10	Laser Operator	LOAP Notification.	In the event of a laser firing outside authorized parameters, the laser operator must verbally notify LCH or the ADO within 15 minutes of discovery. See IER #7 in Table 5.

5.4. SPACE EVENT NOTIFICATION.

a. In the timeframe (generally 24 hours) between the laser operator's receipt of the PAM and the laser firing, a satellite on the MPL may maneuver or a new satellite may be launched. Every effort will be made to prevent these events from interfering with the laser firings; however, the LCH retains the authority to delay or cancel an activity if it is deemed necessary to protect satellites.

b. In the case where a new or maneuvered satellite may be affected by a laser firing, LCH or the ADO may direct a halt to the test, and/or generate and forward to the laser operator updated deconfliction open windows that incorporate the new/maneuvered satellite. (See IER #5 in Table 5.)

5.5. POST-ACTIVITY ASSESSMENTS AND REPORTING.

a. If a laser operator sends notification of a LOAP, the laser operator must submit additional details to the LCH within 12 hours in the LOAP Report. (See IER #8 in Table 5 for details.)

b. The laser firing data recorded by the system in Task 3.7 above is used in the Laser Activity Summary Report (LASR). The report must be submitted 24 hours after a LOAP Notification (Task 3.10 above). For routine laser firings, the laser operator must archive the data for one year in case LCH requests data for post activity analysis. A LASR is only required if requested within that time by LCH. See IER #9 in Table 5.

Table 4 - Post-Activity Assessments and Reporting Tasks.

Task	OPR	Description	Implementation
4.1	Laser Operator	Download post activity analysis data.	Transfer data recorded during the laser activity (Task 3.7) for post activity reports, as required. Archive the data for one year. See Appendix A.
4.2	Laser Operator	Send LOAP Report to LCH. (if required)	Within 12 hours after a LOAP Notification is sent. See IER #8 in Table 5.
4.3	Laser Operator	Compile post activity analysis data and send LASR to LCH (if required).	Within 24 hours after a LOAP Notification or within 3 days if requested by LCH. (IER #9 in Table 5)

SECTION 6: COMMUNICATIONS INFRASTRUCTURE

6.1. COMMUNICATIONS INFRASTRUCTURE.

a. Communications connectivity will be established between the laser operator and LCH or the ADO. The communications infrastructure will include voice, fax, and data transmissions. The laser operator will support unclassified communications at a minimum. Classified communications can also be supported if required by the laser system's Security Classification Guide. Required voice communications capabilities include two unclassified voice lines. Required data communications capabilities include two unclassified e-mail addresses. The Remarks section of the PRM must list current contact information specific to each laser program.

b. **LCH contact information:**

Position: Duty Officer

Address: JFCC SPACE/J39/LCH
747 Nebraska Avenue, Room B209
Vandenberg AFB, CA 93437

Unclassified Phone: (805) 606-1282, DSN 276-1282

Secure Phone or Fax: Contact LCH

E-mail: laserclearinghouse@us.af.mil

SIPRNet: usaf.vandenberg.afspc.mbx.jspoc-lch@mail.smil.mil

c. **ADO contact information:**

Position: Duty Officer

Address: JFCC SPACE/JSpOC/COD/ADO
Building 8410
Vandenberg AFB, CA 93437

Unclassified Phone: (805) 605-6546, DSN 275-6546

E-mail: JSpOCSSAOps@us.af.mil (subject line include Attn: ADO)

SIPRNet: usaf.vandenberg.afspc.mbx.jspoc-ssa-ops@mail.smil.mil
(subject line include Attn: ADO)

SECTION 7: INFORMATION EXCHANGE REQUIREMENTS

The IERs in Table 5 have been established to support the deconfliction procedures discussed above. Administrative information exchanges are not included. The *LCH Reports Handbook*[3] defines the voice and text message formats and content. The *Space Deconfliction System Interface Control Document*[4] specifies the format and content of the data messages.

Table 5 - Information Exchange Requirements.

#	Information	Content	Format	Source	Recipient	Media	Time Frame
1	Master Test and Operations Schedule	Per Handbook Section 3.3	Text	Laser Owner	LCH	E-mail	NLT the 15th day of each month.
2	Program Request Message	Per ICD Section 4.2.1.1	Text	Laser Owner	LCH or ADO	Web site	NLT 3 days prior to laser activity
3	Program Approval Message	Per ICD, Section 4.3.1.1	Text	LCH or ADO	Laser Owner	Web site	24 hours prior to laser firing
4	Laser Status Report	Per Handbook Section 2.2	Voice	Laser Owner	LCH or ADO	Phone	One hour prior to beginning of firing
5	Space Event Notification	Per Handbook Section 2.5	Voice	LCH or ADO	Laser Owner	Phone	As required
6	Quick Look Report	Per Handbook Section 2.3	Voice	Laser Owner	LCH or ADO	Phone	Within 15 minutes of completion of laser firings for the day
7	LOAP Notification	Per Handbook Section 2.4	Voice	Laser Owner	LCH or ADO	Phone	Within 15 minutes of determining a laser firing outside authorized parameters occurred
8	LOAP Report	Per Handbook Section 3.2	Text	Laser Owner	LCH	Fax or e-mail	Within 12 hours after LOAP Notification (IER #7)
9	Laser Activity Summary Report	Per ICD Section 4.2.1.3.	Text	Laser Owner	LCH	Mail, fax or e-mail	Within 24 hours of LOAP Notification (IER #7); also archive data for 1 year and provide within 3 days upon LCH request

[3] *Laser Clearinghouse Reports Handbook*, Change 6, 16 June 2017.

[4] *Interface Control Document for the USSTRATCOM JFCC SPACE, Space Deconfliction System*, B002-SPACE-DECON-LP 14-2-ICD-02, 5 December 2014.

SECTION 8: DECONFLICTION CAPABILITY VALIDATION PROCESS

8.1. VALIDATION PURPOSE AND REQUIREMENTS.

a. The purpose of deconfliction capability validation is to ensure the technical parameters of the laser system are well understood, processes and procedures are in place, personnel are trained on equipment and procedures, and communications mechanisms are established.

b. System validation must be documented by the laser owner in the form of test reports or analyses and provided to LCH as inputs to the validation process. Previously documented tests or analyses are acceptable. LCH will analyze the data to verify that the default keep-out-cone accounts for all laser system and satellite errors, or whether a smaller cone size is more appropriate.

8.2. SOFTWARE TEST REQUIREMENTS.

a. If the laser system employs an automated capability to ensure the laser is operated within approved azimuth/elevation boundaries and open time windows, the system must be sufficiently tested to assure proper operations. The laser owner must also certify that these capabilities have been satisfactorily tested per Appendix C.

b. Re-testing or additional analysis is required whenever a relevant configuration item is modified. Relevant configuration items can include, but are not limited to: laser components; computer hardware and software; telescope mounting, tracking, and optical components; and other system configuration items such that modifications to those items would affect deconfliction performance and processes to the extent that they would change system data previously submitted to the LCH.

8.3. DECONFLICTION PROCEDURES.

a. The laser operator must develop written procedures that outline the responsibilities of personnel participating in the laser activity. In addition, the laser operator will certify that all personnel are sufficiently trained on these procedures per Appendix C.

b. Finally, an end-to-end demonstration will be conducted to ensure procedures and communications links between the laser operator and LCH are sufficient to perform all functions (see Appendix B).

c. Validation tests and analyses must be completed and reports submitted to the LCH per the schedule in Table 6. LCH will compile the validation results provided by the laser owner and submit a coordinated recommendation to the Commander, JFCC SPACE (or designee) for final authorization of the laser activity.

SECTION 9: DECONFLICTION CAPABILITY VALIDATION CRITERIA

The criteria listed below must be satisfied to validate deconfliction capabilities for the laser activity. These criteria may be validated through incremental testing. In the event of system modifications to deconflict capabilities, the system will be re-tested to ensure these criteria remain valid.

Table 6 - Validation Criteria.

#	Validation Criteria	Validation Documentation	OPR	Date Due
1	LCH deconfliction capabilities identified in Section 4 have been satisfactorily tested.	Numerical Validation Report or Operational-Acceptance Memo for most recent version of DECON.	LCH	90 Days prior to authorization
2	Laser deconfliction capabilities identified in this plan have been satisfactorily tested.	Laser system and software test reports.	Laser Owner	2 weeks prior to E2E
3	Verification of laser system parameters (including laser positional uncertainty, laser beam divergence, boresight errors and laser system failure modes) affecting the keep-out cone size for open window computation.	Laser System Keep Out Cone (KOC) Analysis Document.	Laser Owner	2 weeks prior to E2E
4	Deconfliction procedures have been developed, documented, and verified; and trained personnel are available.	Statement of Certification of Deconfliction Capabilities due prior to the end to end demonstration. See Appendix C for sample.	Laser Operator	1 week prior to E2E
5	DoD 3100.11 Compliance Statement whether the laser activity requires SECDEF approval.	Statement of Compliance with DoDI 3100.11. Due prior to the end to end demonstration if a DoD program. See Appendix D for sample.	Laser Owner	1 week prior to E2E
6	Interfaces, interoperability and procedures between the LCH and the laser operator including information exchange requirements have been verified.	End-to-end demonstration of Deconfliction capabilities report. See Appendix B for the demonstration script. Criteria #1-5 (5 only if a DoD program) must be completed prior to end-to end demonstration.	LCH and Laser Operator	2 weeks prior to authorization

GLOSSARY

Term	Definition
AFB	Air Force Base
AFRL	Air Force Research Laboratory
AFSPC	Air Force Space Command
AOC	Aerospace Operations Center
Centralized Deconfliction	A means of deconfliction where the Laser Clearinghouse provides safe operating ("open") windows to the laser owner/operator.
COD	Combat Operations Division
Deconfliction	Actions taken to ensure that planned activities do not inadvertently affect other satellites or their mission effectiveness.
DoD	Department of Defense
DoDI	Department of Defense Instruction
DoD Laser Activity	Any DoD-sponsored laser research, development, developmental test, operational test, evaluation, or exercise in which a laser is fired to, in, through or from space, or aimed above the horizon with the potential to inadvertently or adversely affect satellites or humans in space.
E2E	End to End Demonstration
GP	General Perturbation
ICD	Interface Control Document
IER	Information/ Exchange Requirement
Illumination	The emission of energy from a laser directed at a target. (Reference: DoDI 3100.11, Enclosure 1)
JFCC SPACE	Joint Functional Component Command for Space
JSpOC	Joint Space Operations Center
LCH	Laser Clearinghouse
LO/O	Laser Owner Operator
MOA	Memorandum of Agreement
MPL	Master Protect List
Open Windows	Times at which it is safe for lasers to fire if no conflict exists with satellites on the Master/Unique Protect List.
Deconfliction	Deconfliction: A deconfliction process that involves the analytical and geometrical method used to: (1) ensure that laser illuminations do not impact upon the safe and effective operation of a satellite, (2) determine if a specific satellite may be inadvertently illuminated, and (3) make informed decisions on the safety of laser activities to, in, through, or from space, or aimed above the horizon.
POC	Point of Contact
SatAC	Satellite Assessment Center. A function of the Air Force Research Laboratory's Directed Energy Directorate.
SI	U.S. Strategic Command Instruction
SIPRNet	Secure Internet Protocol Router Network
ADO	Awareness Duty Operator (at JSpOC)
SSDO	Senior Space Duty Officer (at JSpOC)
USSTRATCOM GOC	United States Strategic Command Global Operations Center

APPENDIX A - LASER SPECIFIC DECONFLICTION INFORMATION

A.1. Appendix A is a laser-specific document that includes a description of the laser program system, typical scenarios for laser activities, details of the laser safety system, laser parameters, deconfliction procedures and any unique requirements not addressed in this Standard Plan, a schedule of laser activities, and points of contact. Appendix A will be signed by the JFCC SPACE Laser Clearinghouse Chief and the laser owner responsible official (e.g. O-5, GS-14, Test Director, Chief Scientist, etc.).

A.2. Final Authorization for the LCH to provide LO/O with deconfliction support in accordance with the deconfliction plan occurs after signature of the Appendix A to this Standard Deconfliction Plan and all validation requirements are met. This authorization is documented by JFCC SPACE in a signed memorandum provided to the laser owner.

APPENDIX B - DESCRIPTION OF END-TO-END DEMONSTRATION PROCEDURES

B.1. End to End Demonstrations.

As part of the capability validation process, the laser operator and LCH will conduct an end-to-end demonstration to evaluate all deconfliction capabilities required in this plan including the Information Exchange Requirements identified in Table 5 of this document. Table 6 validation criteria 1-5 (5 only if DoD a program) must be completed prior to the end-to end demonstration. The generic script for this demonstration is listed below. The end-to-end demonstration will be used to verify that the integrated system of hardware, software, procedures, personnel, development of open windows for laser operations, and communications adequately perform centralized deconfliction and ensure safe and responsible laser use.

B.2. Deconfliction Planning Script.

Activity	OPR	Recipient	Timeframe	Actions / Information Required
PRM (IER #2)	Laser Operator	LCH	3 to 30 days prior to laser firing	Data per ICD, including: Laser Activity Schedule - Laser Type/Description/Laser Location - Target - Pointing Parameters - Time/Duration - Point of Contact (POC)
Update MPL	LCH	N/A	Upon receipt of new information	- Update protect lists based on satellite launches and decays

B.3. Pre-Activity Deconfliction Activities Script.

Activity	OPR	Recipient	Timeframe	Actions / Information Required
PAM (IER #3)	LCH	Laser Operator	Schedule per specific agreement in Appendix A.	Data per ICD, including: - Open windows will list times approved for conducting laser firings within parameters requested

Note: The *Timeframe* may be adjusted or compressed for test/exercise purposes.

B.4. Real Time Deconfliction Script.

Activity	OPR	Recipient	Timeframe	Information Required
Input Open Window times	Laser Operator	N/A	Upon receipt of PAM	- Input Open Window times
Laser Status Report (IER #4)	Laser Operator	LCH	T-1 hour	- Communications check - Notify LCH of laser status and start time of laser activities
Space Event Notification (IER #5)	LCH	Laser Operator	Occurs between open window generation & completion of demonstration	- If a new launch or maneuver of a satellite on the MPL impacts the laser demonstration, LCH may halt the demonstration, or generate revised open windows for the laser
Quick Look Report (IER #6)	Laser Operator	LCH	Within 15 minutes of completion of laser firings	- Notify LCH of stop time of final laser activities and if within approved parameters
LOAP Notification (IER #7)	Laser Operator	LCH	Within 15 minutes of incident	Data per LCH Reports Handbook.

B.5. Post-Activity Activities Script.

Activity	OPR	Recipient	Timeframe	Actions / Information Required
LOAP Report (IER #8)	Laser Operator	LCH	Within 12 hours after determination of a laser incident	Data per LCH Reports Handbook.
LOAP Report	LCH	STRAT-COM GOC	Upon receipt of LOAP Report	- Forward detailed description and supporting details after coordinating with JSpOC SSDO
Laser Activity Summary Report (IER #9)	Laser Owner	LCH	Within 24 hours following submission of a LOAP Report, or within 3 days of request from LCH for any laser activity within the past 12 months	Data per ICD, including: - Time of laser firings - Assessment of firings being within parameters

APPENDIX C - STATEMENT OF CERTIFICATION OF DECONFLICTION CAPABILITIES

From: [insert Laser Owner/Operator name/organization]

To: Laser Clearinghouse
JFCC SPACE/J39
747 Nebraska Avenue
Vandenberg AFB, CA 93437

Subject: Statement of Certification of Deconfliction Capabilities for the [insert laser name]

References:

a. Standard Centralized Deconfliction and Capability Validation Plan for Laser Clearinghouse (LCH) Support to Lasers (insert date of most current document).

b. [insert laser name] Appendix A to the Standard Centralized Deconfliction and Capability Validation Plan (insert date of most current document).

c. Laser Clearinghouse Reports Handbook (insert date of most current document).

d. Deconfliction System Interface Control Document (insert date of most current document).

e. Statement of Certification of Laser Deconfliction Capabilities [insert laser name] (insert date of most current document).

f. If applicable: [insert laser name] Deconfliction System/Software Test Report (insert date of most current document).

1. We certify that all deconfliction capabilities required of the [insert laser name] in the referenced plans are in place and have been satisfactorily verified through testing and analysis.

2. We also certify all personnel who will participate in deconfliction operations are fully trained and available, and will comply with the processes documented in the references.

3. In addition, we certify all the [insert laser name] operational procedures required to implement the referenced plans have been developed, evaluated, reviewed, and approved.

//Signed//

[Laser Owner/Operator Responsible Official
(O-5/GS-14, Test Director, Chief Scientist, etc.)]

APPENDIX D - DoDI COMPLIANCE STATEMENT

From: [insert Laser Owner / Operator name / organization]

To: Laser Clearinghouse
JFCC SPACE/J39
747 Nebraska Avenue
Vandenberg AFB, CA 93437

Subject: Statement of Certification for Compliance with DoD Instruction 3100.11

References:

a. DoD Instruction 3100.11, Management of Laser Illumination of Objects in Space, 24 October 2016.

b. Standard Centralized Deconfliction and Capability Validation Plan (insert date of most current document).

c. [insert laser name] Appendix A to the Standard Centralized Deconfliction and Capability Validation Plan (insert date of most current document).

In accordance with the reference (a) Instruction, we certify that Secretary of Defense approval of [INSERT SYSTEM/PROGRAM NAME HERE] firings as described in reference (b) are not required. None of the criteria in reference (a) Section 3.4.b(1) apply, including having an impact on foreign relations, raising issues of compliance with treaties, requiring coordination with other Government departments or resulting in adverse media coverage.

//Signed//

[Laser Owner/Operator Responsible Official
(O-5/GS-14 or equivalent level)]