Commercial Space Transportation License

License Number: LLO 00-053 (Rev 3)

ORBITAL SCIENCES CORPORATION

is authorized, subject to the provisions of 51 USC Subtitle V, ch. 509, and the orders, rules, and regulations issued under it, to conduct launches.

General. Orbital Sciences Corporation (Orbital) is authorized to conduct:

(i) flights of Pegasus expendable launch vehicles from Vandenberg Air Force Base (VAFB), and,

(ii) pre-flight ground operations at VAFB involving Pegasus associated with the conduct of any flights that require a Federal Aviation Administration license.

This license is granted subject to the terms, conditions, and limitations set forth in licensing orders A, B, C, and D and any subsequent orders issued by the Office of Commercial Space Transportation.

The licensee shall at all times conduct its operations in accordance with the regulations prescribed by the Office of Commercial Space Transportation for the activities authorized by this license.

US Department
of Transportation
Federal Aviation Administration

800 Independence Ave., S.W.
Washington, D.C. 20591

Original Issued On: August 30, 2000
Rev 3 Effective On: March 22, 2018

Kenneth Wong

Manager, Licensing and Evaluation Division

Revision History:

Original license - Issued August 30, 2000

Revision 1 - Issued August 23, 2010

1) Replaced "Associate Administrator for" with "Office of" prior to all the name Commercial Space Transportation

2) Removed "on flight azimuths and transporting classes of payloads to orbital destinations" as the words are unnecessary. These conditions are specified in the License Order No. LLO 00-053B.

3) Removed "commercial space" preceding "launches" in first paragraph, and preceding "flights under (ii) of the second paragraph.

4) Redesignated License No. LLO 00-053 to "LLO 00-053 (Rev 1)".

Revision 2 - Issued September 1, 2015

1) Due to transfer of code, redesignated Authority to read: "51 USC, Subtitle V, ch. 509".

2) Redesignated License Number LLO 00-053(Rev 1) to "LLO 00-053(Rev 2)".

3) Replaced "Manager, Licensing and Safety Division" with "Manager, Licensing and Evaluation Division".

4) Replaced "Rev 1 Issued On: August 23, 2010" with "Rev 2 Issued On: September 1, 2015.

5) Replaced "Rev 1 Effective On: September 2, 2010" with "Rev 2 Effective On: September 2, 2015".

Revision 3 - Issued March 22, 2018

1) In section (ii), replaced "pre-flight ground operations at VAFB associated with the conduct of Pegasus flights that require a Federal Aviation Administration license" with "pre-flight ground operations at VAFB involving Pegasus associated with the conduct of any flights that require a Federal Aviation Administration license."

OFFICE OF
COMMERCIAL SPACE TRANSPORTATION
LICENSE ORDER REGARDING

LAUNCH

AUTHORIZED BY LICENSE NO. LLO 00-053
ISSUED TO

ORBITAL SCIENCES CORPORATION

---

1. Authority: This Order is issued to Orbital Sciences Corporation, referred to as Orbital, under 51 U.S.C. subtitle V, chapter 509, and 14 C.F.R. Ch. III.

2. Purpose: This Order modifies License No. LLO 00-053 (the license) originally issued August 30, 2000, by the Federal Aviation Administration's Office of Commercial Space Transportation (the Office), authorizing Orbital to conduct launches of Pegasus expendable launch vehicles; and prescribes as conditions to License No. LLO 00-053 certain requirements applicable to those launches.

3. Definitions: For purposes of License No. LLO 00-053 and any orders issued by the FAA pertaining to activities covered by License No. LLO 00-053:

   (a) "Launch" means (i) flight and (ii) pre-flight ground operations, as defined in this section.

   (b) "Flight" means flight of Pegasus launch vehicle utilizing the L-1011 carrier aircraft to orbital destinations, on Pegasus flight azimuths as specified in License Order No. LLO 00-053B issued concurrently by the Office, commencing upon take-off of the L-1011 carrier aircraft from VAFB for carrier aircraft flight to designated release areas for the purpose of releasing a Pegasus launch vehicle. Flight ends upon safing of the Pegasus launch vehicle stages or components that reach earth orbit following separation of the payload from the Pegasus launch vehicle or upon wheels stopping after landing of the L-1011 carrier aircraft, whichever occurs later.

(c) "Pre-flight ground operations" mean Orbital's operations at VAFB associated with the conduct of any flights requiring an FAA license, beginning with the arrival of the launch vehicle at VAFB.

(d) For purposes of License No. LLO 00-053, "take-off" of the L-1011 carrier aircraft is deemed to commence upon roll forward of the carrier aircraft immediately following removal of the Pegasus safe and arm pins.

4. License Term: The term of License No. LLO 00-053 authorizing Orbital to conduct launches is five (5) years from September 2, 2015.

OFFICE OF COMMERCIAL SPACE TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

By: Kenneth Wong
Kenneth Wong, Manager
Licensing and Evaluation Division

Issued: September 1, 2015
Effective: September 2, 2015

Revision History:

Original License Order Issued - August 30, 2000

Revision 1 - Issued August 23, 2010

1) Replaced "Associate Administrator for" with "Office of" prior to all the name Commercial Space Transportation

2) In paragraph 2, replaced "amends" with "modifies" and "issued concurrently" with "originally issued on August 30, 2000."

3) Eliminated paragraphs 4 through 12.

4) Renumbered paragraph 13 as paragraph 4 and replace "this license" with "the renewal of the license (September 2, 2010)."

5) Removed "commercial space" in all instances preceding "launch" or flight.

6) Replaced "shall be deemed" with "is" for the sake of plain English.

7) In the new paragraph 4, replaced "this license" with "the renewal of the license (September 2, 2010)." This incorporates the renewal for an additional five year period beyond that originally introduced in License Order No. LLO 00-053E (now obsolete).

8) Redesignated License Order No. LLO 00-053A with "LLO 00-053 (Rev 1)" following.

Revision 2 -Issued September 1, 2015

1) Due to transfer of code, redesignated Authority to read: "51 U.S.C. Subtitle V, ch. 509".

2) Redesignated "License Order No. LLO 00-053A (Rev 1) to "License Order No. LLO 00-053A (Rev 2)".

3) Paragraphs 1, 2, 3(c) and 4: replaced "OSC" with "Orbital" four places. Revised paragraph 3(b) to be consistent with LLO 04-069A (Rev 3).

4) Replaced "Manager, Licensing and Safety Division" with "Manager, Licensing and Evaluation Division".

5) Replaced "Issued: August 23, 2010" with "Issued: September 1, 2015.

6) Replaced "Effective: September 2, 2010" with "Effective: September 2, 2015".

OFFICE OF
COMMERCIAL SPACE TRANSPORTATION
LICENSE ORDER REGARDING

FLIGHT

AUTHORIZED BY LICENSE NO. LLO 00-053
ISSUED TO

ORBITAL SCIENCES CORPORATION

---

1. Authority: This Order is issued to Orbital Sciences Corporation, referred to as Orbital, under 51 U.S.C. subtitle V, chapter 509, and 14 C.F.R. Ch. III.

2. Purpose: This Order modifies License No. LLO 00-053 (the license) originally issued on August 30, 2000, by the Federal Aviation Administration's Office of Commercial Space Transportation, and authorizes Orbital to conduct launches; and prescribes as conditions to License No. LLO 00-053 certain requirements applicable to the authorization to conduct flights.

3. Authorization: Orbital is authorized to conduct flights:

   (a) Using Standard Pegasus, Standard Pegasus with Hydrazine Auxiliary Propulsion System (HAPS), Pegasus XL and Pegasus XL with HAPS launch vehicles, in combination with the L-1011 carrier aircraft that must hold a valid FAA airworthiness certificate and must operate in accordance with the operating limitations of that certificate and the applicable sections of 14 C.F.R. part 91;

   (b) From Vandenberg Air Force Base (VAFB), California;

   (c) On Pegasus flight azimuths from 147 to 234 degrees, inclusive;

   (d) Transporting (i) U.S. Government payloads to any orbit, and (ii) communications, remote sensing and scientific research, and Celestis payloads designed to operate in low earth orbit (specifically, apogees less

than 3,000 nautical miles and perigees between 100 and 500 nautical miles); and

(e) According to the launch vehicle, launch vehicle systems, and equipment designs and the safety management program including organization, personnel, functions and procedures represented or referenced in the Orbital application as of the date of this Order, and any modifications to the license application approved by the Office, in writing.

OFFICE OF COMMERCIAL SPACE TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

By: Kenneth Wong

Kenneth Wong, Manager
Licensing and Evaluation Division

Issued: September 1, 2015
Effective: September 2, 2015

Revision History:

Original License Order Issued - August 23, 2000

Revision 1 - Issued August 23, 2010

1) Replaced "Associate Administrator for" with "Office of" prior to all the name Commercial Space Transportation.

2) In paragraph 2, replaced "amends" with "modifies" and "issued concurrently" with "originally issued on August 30, 2000."

3) From paragraph 3 (a), removed: "For the Pegasus launch vehicle, a nominal commercial space flight shall be deemed concluded upon safing of Pegasus launch vehicle stages or components that reach earth orbit following separation of the payload. For the L-1011 carrier aircraft, a nominal commercial space flight shall be deemed concluded upon the release of the Pegasus launch vehicle. In the event of an aborted attempt to release the Pegasus launch vehicle following the take-off of the L-1011, a commercial space flight attempt will be deemed completed when the L-1011 aircraft lands at RTS or an emergency divert facility with the Pegasus still attached." This text is redundant with that in paragraph 3(b) of License Order No. LLO 04-069A.

4) Corrected the second (c) under paragraph 3 to (d).

5) Eliminated paragraphs 4 through 8.

6) Removed "commercial space" in all instances preceding "launch" or "flight."

7) Redesignated License Order No. LLO 00-051B with "(Rev 1)" following.

Revision 2 - Issued September 1, 2015

1) Due to transfer of code, redesignated Authority to read: "51 U.S.C. Subtitle V, ch. 509".

2) Redesignated "License Order No. LLO 00-053B (Rev 1) to "License Order No. LLO 00-053B (Rev 2)".

3) Paragraphs 1,2 and 4: Replaced "OSC" with "Orbital" three places.

4) In subparagraph 3(a), replaced "Federal Aviation Administration certificated L-1011 aircraft…;" with "L-1011 carrier aircraft that must hold a valid FAA airworthiness certificate and must operate in accordance with the operating limitations of that certificate and the applicable sections of 14 C.F.R. part 91;"

5) Replaced "Manager, Licensing and Safety Division" with "Manager, Licensing and Evaluation Division".

6) Replaced "Issued: August 23, 2010" with "Issued: September 1, 2015".

7) Replaced "Effective: September 2, 2010" with "Effective: September 2, 2015".

License Order No. LLO 00-053C (Rev 3)

OFFICE OF
COMMERCIAL SPACE TRANSPORTATION
LICENSE ORDER REGARDING

PRE-FLIGHT GROUND OPERATIONS

AUTHORIZED BY LICENSE NO. LLO 00-053
ISSUED TO

ORBITAL SCIENCES CORPORATION

---

1. Authority: This Order is issued to Orbital Sciences Corporation, referred to as Orbital, under 51 U.S.C. subtitle V, chapter 509, and 14 C.F.R. Ch. III.

2. Purpose: This Order modifies License No. LLO 00-053 (the license) originally issued on August 30, 2000, by the Federal Aviation Administration's Office of Commercial Space Transportation, authorizing Orbital to conduct launches for which an FAA license is required, and prescribes as conditions to License No. LLO 00-053 certain requirements applicable to the authorization to conduct pre-flight ground operations.

3. Authorization: Orbital is authorized to conduct pre-flight ground operations at Vandenberg Air Force Base (VAFB) involving Pegasus associated with the conduct of any flights (not limited to flights utilizing the L-1011 carrier aircraft) for which an FAA license is required, beginning with the arrival of the Pegasus launch vehicle at VAFB.

OFFICE OF COMMERCIAL SPACE TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

By: Kenneth Wong

Kenneth Wong, Manager
Licensing and Evaluation Division

Issued: March 22, 2018
Effective: March 22, 2018

Revision History:

Original License Order Issued - August 30, 2000

Revision 1 - Issued August 23, 2010

1) Replaced "Associate Administrator for" with "Office of" prior to all the name Commercial Space Transportation

2) In paragraph 2, replaced "amends" with "modifies" and "issued concurrently" with "originally issued on August 30, 2000."

3) Removed "commercial space" in all instances preceding "launch" or "flight."

4) Eliminated paragraphs 4 and 5.

5) Redesignated License Order No. LLO 00-051C with "(Rev 1)" following.

Revision 2 - Issued September 1, 2015

1) Due to transfer of code, redesignated Authority to read: "51 U.S.C. Subtitle V, ch. 509".

2) Redesignated "License Order No. LLO 00-053C (Rev 1) to "License Order No. LLO 00053C (Rev 2)".

3) Paragraphs 1,2 and 3: Replaced "OSC" with "Orbital" three places.

4) Replaced "Manager, Licensing and Safety Division" with "Manager, Licensing and Evaluation Division".

5) Replaced "Issued: August 23, 2010" with "Issued: September 1, 2015.

6) Replaced "Effective: September 2, 2010" with "Effective: September 2, 2015".

Revision 3 - Issued March 22, 2016

1) Replaced paragraph 3 with "Orbital is authorized to conduct pre-flight ground operations at Vandenberg Air Force Base (VAFB) involving Pegasus associated with the conduct of any flights (not limited to flights utilizing the L-1011 carrier aircraft) for which an FAA license is required, beginning with the arrival of the Pegasus launch vehicle at VAFB."

OFFICE OF
COMMERCIAL SPACE TRANSPORTATION
LICENSE ORDER REGARDING

FINANCIAL RESPONSIBILITY REQUIREMENTS

AUTHORIZED BY LICENSE NO. LLO 00-053
ISSUED TO

ORBITAL SCIENCES CORPORATION

---

1. Authority: This Order is issued to Orbital Sciences Corporation, referred to as Orbital, under 51 U.S.C. subtitle V, chapter 509, and 14 C.F.R. Ch. III.

2. Purpose: This Order modifies License No. LLO 00-053 (the license) originally issued August 30, 2000, by the Federal Aviation Administration's Office of Commercial Space Transportation, by prescribing financial responsibility requirements for licensed launch activities in accordance with 14 C.F.R. part 440.

3. Liability Insurance: Orbital shall maintain a policy or policies of liability insurance (or otherwise demonstrate financial responsibility) in accordance with 14 C.F.R. § 440.9(b) in the amount of:

   (a) Thirty Seven Million Dollars ($37,000,000) for covered claims resulting from a flight, commencing upon take-off of the L-1011 carrier aircraft from VAFB; and

   (b) Ten Million Dollars ($10,000,000) for covered claims resulting from pre-flight ground operations performed at VAFB.

4. Government Property Insurance: Orbital shall maintain a policy or policies of insurance (or otherwise demonstrate financial responsibility) in accordance with 14 C.F.R § 440.9(d) in the amount of:

   (a) One Million Dollars ($1,000,000) for covered property claims resulting from a flight, commencing upon take-off of the L-1011 carrier aircraft from VAFB; and

(b) Eight Million Six Hundred Thousand Dollars ($8,600,000) for covered property claims resulting from pre-flight ground operations performed at VAFB.

5. Covered property includes all property owned, leased, or occupied by, or within the care, custody, or control of, the United States and its agencies, and its contractors and subcontractors involved in licensed launch activities, at VAFB.

OFFICE OF COMMERCIAL SPACE TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

By: Kenneth Wong
Kenneth Wong, Manager
Licensing and Evaluation Division

Issued: September 1, 2015
Effective: September 2, 2015

Revision History:

Original License Order - Issued August 29, 2000

Revision 1 - Issued August 19, 2005

1) Replaced "issued concurrently" in paragraph 2 with "originally issued on August 30, 2000."

2) Changed paragraph 7(b) from "Insurance in the amount of Twenty Seven Million Dollars ($27,000,000) for covered property claims resulting from pre-flight ground operations performed at VAFB" to "Insurance in the amount of Five Million Five Hundred Thousand Dollars ($5,500,000) for covered property claims resulting from pre-flight ground operations performed at VAFB."

Revision 2 - Issued August 23, 2010

1) For the sake of consistency, replaced "Under" with "AUTHORIZED BY" in the title.

2) Replaced "Associate Administrator for" with "Office of" prior to all the name Commercial Space Transportation

3) In paragraph 2, replaced "amends" with "modifies," insert "originally" after the license number, and delete ", and renewed on August 19, 2005."
4) Eliminated paragraphs 3, 4, 5, and 8 through 12.

5) Replaced paragraph 6 with "Liability Insurance: OSC shall maintain a policy or policies of liability insurance (or otherwise demonstrate financial responsibility) in the amount of Thirty Seven Million Dollars ($37,000,000) for covered claims resulting from a flight, commencing upon take-off of the L-1011 carrier aircraft from VAFB; and Ten Million Dollars ($10,000,000) for covered claims resulting from pre-flight ground operations performed at VAFB, in accordance with 14 C.F.R. § 440.9(b)," and renumber as paragraph 3.

6) Replaced paragraph 7 with "Government Property Insurance: OSC shall maintain a policy or policies of insurance (or otherwise demonstrate financial responsibility) in the amount of One Million Dollars ($1,000,000) for covered property claims resulting from a flight, commencing upon take-off of the L-1011 carrier aircraft from VAFB; and Eight Million Six Hundred Thousand Dollars ($8,600,000) for covered property claims resulting from pre-flight ground operations performed at VAFB, in accordance with 14 C.F.R § 440.9(d).

   Covered property includes all property owned, leased, or occupied by, or within the care, custody, or control of, the United States and its agencies, and its contractors and subcontractors involved in licensed launch activities, at VAFB," and renumber as paragraph 4.

7) Removed "commercial space" in all instances preceding "launch" or "flight."

8) Redesignated License Order No. LLO 00-053D (Rev 1) to "(Rev 2)"

Revision 3 - Issued September 1, 2015

1) Due to transfer of code, redesignated Authority to read: "51 U.S.C. Subtitle V, ch. 509".

2) Redesignated "License Order No. LLO 00-053D (Rev 2) to "License Order No. LLO 00-53D (Rev 3)".

3) Paras 1,3 & 4: Replaced "OSC" with "Orbital" three places. Adjusted outline format of License Order to match standardized outline of all License Orders

4) Replaced "Manager, Licensing and Safety Division" with "Manager, Licensing and Evaluation Division".

5) Replaced "Issued: August 23, 2010" with "Issued: September 1, 2015".

6) Replaced "Effective: September 2, 2010" with "Effective: September 2, 2015".