Downloaded from http://www.everyspec.com

NASA

Directive: NPD 8710.3B

POLICY
DIRECTIVE

Effective Date: January 27, 2003
Expiration Date: January 27, 2013

COMPLIANCE IS MANDATORY

This Document Is Uncontrolled When Printed.
Check the NASA Online Directives Information System (NODIS) Library
to verify that this is the correct version before use:
http://nodis3.gsfc.nasa.gov

Responsible Office: Q / Office of Safety and Mission Assurance

Subject: NASA Policy for Limiting Orbital Debris Generation (Revalidated 4/28/04)

1. POLICY

It is NASA policy to limit the generation of orbital debris (OD), consistent with mission requirements and cost effectiveness (Requirement 6025). To accomplish this policy, NASA will --

a. Conduct formal OD assessments in accordance with NSS 1740.14, Guidelines and Assessment Procedures for Limiting Orbital Debris, on each space program/project to determine its potential to generate OD during nominal operations (Requirement 6001).

b. Design for safe disposal of spacecraft and launch vehicles at end of mission in accordance with NSS 1740.14, Guidelines and Assessment Procedures for Limiting Orbital Debris, and JSC-27862, Postmission Disposal of Upper Stages (Requirement 6026).

c. Provide timely notification to, and coordination with, other appropriate government entities concerning the proposed reentry of NASA spacecraft or their rocket bodies from Earth orbit (Requirement 6027).

d. Promote the adoption of international policies, standards, and practices to minimize OD and its associated risks, and the exchange of information on OD research, modeling, and mitigation techniques in the international community (Requirement 6028).

Downloaded from http://www.everyspec.com

2. APPLICABILITY

a. This NPD is applicable to the following:

(1) All NASA space programs/projects at NASA Headquarters or NASA Centers that design, build, operate, or procure hardware that may generate or become OD in Earth's orbit, or become OD by reentering the Earth's atmosphere after end of mission. (It is also applicable to NASA contractors, grantees, cooperative, or other agreement entities to the extent provided in the governing agreement.)

(2) NASA instruments that fly on non-NASA spacecraft (to the extent that the instruments must be designed to minimize contributions to OD generation).

b. OD is defined as follows:

(1) Spacecraft or payloads that can no longer perform their mission.

(2) Rocket bodies, payload adapters, and other hardware (e.g., bolt fragments, lens covers, spin weights) left in orbit as a result of normal launch and operational activities.

(3) Fragmentation products from failures or collisions. Gases and short-lived liquids in free state are not considered OD.

c. For programs that were beyond Preliminary Design Review (PDR) in their development cycle prior to April 5, 1993, this NPD applies to the extent that the assessment is limited to documenting, and executing if feasible, mission planning and operational procedures that minimize OD generation, and to documenting debris mitigation options at end of mission.

3. AUTHORITY

Section 203(c)(1) of the National Aeronautics and Space Act of 1958, as amended, (42 U.S.C. 2473(c)(1)).

4. REFERENCES

a. 14 CFR Subparts 1216.1 and 1216.3.

b. PDD-NSC-49/NSTC-8, National Space Policy, September 14, 1996.

c. NPD 8010.3, Notification of Intent to Terminate Operating Space Systems.

d. "U.S. Government Orbital Debris Mitigation Standard Practices," December 2000.

e. NSS 1740.14, Guidelines and Assessment Procedures for Limiting Orbital Debris.

Downloaded from http://www.everyspec.com

f. "Technical Report on Space Debris," of the Scientific and Technical Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space, A/AC.105/720, 1999.

g. JSC-27862, Postmission Disposal of Upper Stages, December 1998.

5. RESPONSIBILITY

a. The Office of Safety and Mission Assurance (OSMA) is responsible for the following:

(1) Establishing policies for limiting OD generation and policies for the safe disposal of spacecraft, payloads, and launch vehicle components at end of mission (Requirement 6003).

(2) Providing guidelines and standards for assessment of OD generation potential and risks (Requirement 6030).

(3) Reviewing OD assessments and end-of-mission plans, in conjunction with the responsible Enterprise Associate Administrator(s) (EEA), to determine if each space program/project is in compliance with Agency OD policy standards (Requirement 6004).

(4) Providing software tools and modeling to aid programs in OD risk analysis and evaluation of mitigation options (Requirement 6031).

(5) Coordinating NASA OD reentry information within the Agency (Requirement 6032).

b. The mission specific program/project manager for each space program/project is responsible for the following:

(1) Ensuring the implementation of OD mitigation measures for all mission hardware in Earth orbit as described in NSS 1740.14, Guidelines and Assessment Procedures for Limiting Orbital Debris, and JSC-27862, Postmission Disposal of Upper Stages (Requirement 6034). OD mitigation measures include:

(a) Limiting the generation of OD associated with normal space operations.

(b) Limiting the probability and/or consequences of impact with existing OD, space structures, or meteoroids, or the probability of accidental explosions that can result in spacecraft/vehicle fragmentation.

(c) Depleting onboard energy sources (e.g. chemical, mechanical, electrical) to the greatest extent possible after completion of mission.

(d) Limiting orbit lifetime after mission completion to a maximum of 25 years (with the intent to minimize orbit lifetime as much as possible) or maneuvering to an approved disposal orbit, as described in NSS 1740.14, Guidelines and Assessment Procedures for Limiting Orbital Debris.

(e) Providing for safe disposal or limiting the risk from space systems components that will survive reentry as a result of postmission disposal.

Downloaded from http://www.everyspec.com

(2) Ensuring that a mission OD assessment has been conducted in accordance with NSS 1740.14, Guidelines and Assessment Procedures for Limiting Orbital Debris, to determine the potential for OD generation from the launch vehicle and the payload (Requirement 6005).

(3) Coordinating the assessment results with their cognizant EAA, OSMA, and the Office of Space Flight (OSF) in accordance with the timelines and in the format specified in NSS 1740.14, Guidelines and Assessment Procedures for Limiting Orbital Debris (Requirement 6006).
Programs that justify noncompliance consistent with cost effectiveness and mission requirements must provide a cost analysis or requirements analysis that documents the impact of full compliance and any unique risks of noncompliance to the appropriate EAA(s) and OSMA (Requirement 30894).

(4) Ensuring that environmental assessment and notification requirements as defined herein and in NPD 8010.3, Notification of Intent to Terminate Operating Space Systems, are met (Requirement 6035).

(5) Designing for end-of-mission disposal, developing an end-of-mission plan, and submitting the plan to the responsible EAA for approval (Requirement 6036.

(6) Consulting with the NASA Environmental Management Division, the Office of External Relations, and the Office of the General Counsel if the OD assessment indicates that debris may reenter the Earth's atmosphere and strike the Earth's surface (Requirement 6037).

(7) Communicating with the Department of Defense's Cheyenne Mountain Operations Center prior to significant spacecraft operational or end-of-mission maneuvers (Requirement 6038). Coordination is not required for small station keeping maneuvers, i.e., those that result in a change of altitude of less than 1 km.

c. The cognizant EAA is responsible for the following:

(1) Ensuring that the space program/project is in compliance with NASA policy and approving the OD assessments after review by OSMA and OSF (for launch vehicle) (Requirement 6040).

(2) Reviewing the cost analysis or mission requirements analysis provided by the programs as justification for noncompliance (Requirement 6041).

(3) Approving the end-of-mission plan after coordinating with other affected Agency offices (Office of the General Counsel, Environmental Management Division, Office of External Relations, OSF, OSMA, and the Office of Public Affairs) (Requirement 6011).

d. OSF is responsible for the following:

(1) Procuring launch vehicle services that meet launch requirements and assuring compliance of the launch vehicle and its generated debris (e.g., Dual Payload Attach Fitting-DPAF and upper stages (see JSC-27862, Postmission Disposal of Upper Stages)) with Agency OD mitigation policy and standards consistent with mission requirements and cost effectiveness (Requirement 6043).

(2) Reviewing debris assessments, in conjunction with the responsible EAA(s), to determine if each launch vehicle is in compliance with Agency OD

Downloaded from http://www.everyspec.com

policy and standards (Requirement 6013).

(3) Reserved.

e. The Office of External Relations is responsible for the following:

(1) Providing appropriate OD mitigation strategies and requirements in negotiated international agreements for space activities and launch services (Requirement 6046).

(2) Developing procedures in consultation with the EAA's, OSMA, and the Office of the General Counsel for coordinating information about NASA spacecraft and other significant NASA reentries with other U.S. government agencies (Requirement 6047).

(3) Coordinating all NASA pre-reentry press releases with the National Security Council and the Office of Science and Technology Policy (Requirement 6048).

f. The Office of Public Affairs is responsible for the following:

(1) Coordinating all NASA pre-reentry press releases with the U.S. Space Command (via Department of Defense Public Affairs) and the NASA Office of External Relations (Requirement 6050).

(2) Distributing timely and accurate information about NASA spacecraft reentries to the public (Requirement 6051).
g. The Director, Johnson Space Center, through the OD Program Office, is responsible for the following:

(1) Developing, maintaining, and updating the OD environment models to support this policy (Requirement 6053).

(2) Assisting space program/project managers in technical debris assessments by providing information and/or directing queries to the appropriate technical staff (Requirement 6054).

(3) Providing technical review of OD assessments for OSMA (Requirement 6055).

(4) Reviewing end-of-mission plans for NASA spacecraft disposal (Requirement 6056).

(5) Providing technical and policy assistance to all NASA Headquarters Offices and Centers on matters pertaining to OD (Requirement 6057).

(6) Maintaining a list of predicted reentry dates for NASA spacecraft and their associated orbital stages and notifying the appropriate NASA personnel (Requirement 6058).

(7) Promoting the adoption and use of international OD mitigation guidelines through international forums, such as the Inter-Agency Space Debris Coordination Committee (Requirement 6059).

(8) Providing a liaison with the Department of Defense for coordination on matters of Agency OD policies and a liaison with Cheyenne Mountain Operations Center on matters of operations of NASA spacecraft, particularly when orbit changes are planned (Requirement 6044).

Downloaded from http://www.everyspec.com

h. The Director, Kennedy Space Center, through the Launch Services Office, is responsible for the following:

(1) Supporting and implementing program OD requirements in launch service and launch operations planning activities and contracts, as appropriate (Requirement 6061).

(2) Communicating with the launch vehicle manufacturers and service providers on matters of OD on behalf of the programs/projects (Requirement 6062).

(3) Providing debris assessment information for launch vehicles (and associated payload adapters) to the spacecraft program/project manager for integration into the mission OD assessment report (Requirement 6063).

i. NASA Safety and Mission Assurance Directors are responsible for the following:

(1) Ensuring program/project personnel are aware of OD policies and standards (Requirement 6065).

(2) Providing assistance to the programs/projects by reviewing and providing comments to OD assessments to assure their compliance with policies (Requirement 6066).

j. The NASA contract, grant, cooperative agreement, or other agreement officer is responsible for ensuring that this policy is incorporated, as appropriate, into the governing agreement (Requirement 6067).

6. DELEGATION OF AUTHORITY

None.

7. MEASUREMENTS

Compliance with this policy will be determined by the following metrics:

a. Timely development of debris-generation assessments by the program/project (for review at the PDR) and how well debris-generation assessments are updated during program/project development for finalization at the Critical Design Review (Requirement 6018).

b. Timely submittal of debris-generation assessments by the cognizant EAA and timely review and acceptance by the applicable EAA(s) (Requirement 6019).

8. CANCELLATION

NPD 8710.3A, dated January 27, 2003.

REVALIDATED April 28, 2004

Downloaded from http://www.everyspec.com

/s/ Sean O'Keefe
Administrator

ATTACHMENT A: (TEXT)

None.

(URL for Graphic)

None.

DISTRIBUTION:
NODIS

This Document Is Uncontrolled When Printed.
Check the NASA Online Directives Information System (NODIS) Library
to Verify that this is the correct version before use: http://nodis3.gsfc.nasa.gov