National Aeronautics and Space Administration (NASA) Fiscal Year 2024 Agency Report

1. Please provide a summary of your agency's activities undertaken to carry out the provisions of OMB Circular A-119, "Federal Participation in the Development and Use of Voluntary Consensus Standards (VCS) and in Conformity Assessment Activities" and the National Technology Transfer and Advance Act (NTTAA). The summary should contain a link to the agency's standards-specific website(s) where information about your agency's standards and conformity assessment related activities are available.

NASA promotes the use of VCS by identifying and approving NASA-endorsed technical standards, a "pick list" of technical standards to consider first when selecting program and project requirements. These activities facilitate selection and use of VCS in lieu of NASA technical standards or other government agency standards in compliance with OMB Circular No. A-119. NASA directly cites OMB Circular A-119 and the preference for use of VCS and participation in VCS bodies' activities in NASA directives (NASA Policy Directive (NPD) 7120.4, NASA Engineering and Program/Project Management Policy, and NASA Procedural Requirements (NPR) 7120.10, Technical Standards for NASA Programs and Projects). Proven, consensus-based standards are critical in defining engineering, safety and mission assurance, and health and medical requirements for NASA missions. These technical standards include, but are not limited to, voluntary consensus standards (VCS) cited in NASA directives and technical standards, other government agency standards, NASA technical standards, and NASA-endorsed standards. As NASA technical standards are developed and revised, more VCS are incorporated where appropriate. Many examples of NASA Technical Standards citing use of VCS, and access to those VCS, can be found on the NASA Technical Standards System Web site at https://standards.nasa.gov. NASA requires, prior to proposing development, revision, or revalidation of a NASA technical standard, a determination be made whether a VCS exists or is in development that meets or can be tailored to meet NASA's needs. NASA technical discipline experts also evaluate the opportunity to replace an existing NASA technical standard with a VCS or propose conversion to a VCS, thereby reducing duplicate standards. NASA follows the process required for VCS specified in OMB Circular A-119: openness, balance, due process, appeals process, and consensus.

NASA encourages participation in VCS developing bodies and collects data on participation in development and revision of VCS. During this reporting period, 139 NASA representatives participated in 606 VCS development/revision activities in 36 Standards Developing Bodies. NASA's participation in VCS development/revision activities slightly increased from FY2023 to FY2024, although some participants and documents in work changed.

In the ASTM F47 Commercial Spaceflight Committee, NASA participation spans a range of robotic and human spaceflight topics designed to develop standards that can be endorsed as a means of complying with FAA regulations or NASA requirements, or that can generally promote a more cogent state-of-practice in nascent areas where NASA has strategic interest in commercial services capabilities. NASA is involved in the development of a new Guide or Practice entitled, "New Practice for Safe Operating Practices In-Space for Space Fission Reactors Used for Nuclear Power and Propulsion." This activity was identified as a high-priority gap for NASA. The effort will result in a recommended state-of-practice for in-space nuclear safety of fission systems that can be voluntarily followed by commercial vendors or levied on NASA contracts as appropriate, and which may eventually be endorsed by a to-be-legislated in-space nuclear regulatory authority. NASA participation in the development of NFPA 461, Standard for

Fire Protection of Spaceport Facilities also supports filling a gap in commercial human spaceflight standards.

Several NASA representatives participated in the ISO TC20/SC14 Subcommittee for Space Systems and Operations in support of promoting development and use of VCS. The committee's scope of work is the standardization for crewed and uncrewed space vehicles, their design, production, maintenance, operation, and disposal, and the environment in which they operate. Eight working groups provide an international forum for addressing the standardization needs and concerns of organizations and personnel involved with the development and operation of space systems. NASA currently supports the development/revision of over 19 ISO TC20/SC14 international consensus standards.

NASA continues to be well represented on AIAA committees to promote development/revision and use of VCS, as these standards are applied on many NASA programs and projects in lieu of NASA standards. Some examples are the AIAA Aerospace Pressure Vessels Committee; AIAA S-080, Space Systems - Metallic Pressure Vessels, Pressurized Structures, and Pressure Components; AIAA S-081, Space Systems - Composite Overwrapped Pressure Vessels (COPVs); AIAA S-082 202x, Space Systems - Composite Overwrapped Pressure Vessels with a Composite Liner; AIAA S-110, Space Systems - Structures, Structural Components, and Structural Assemblies; AIAA-S-113, Criteria for Explosive Systems and Devices on Space and Launch Vehicles; AIAA-S-136 -202x, Battery Safety Standard for Space Applications; AIAA-S-144-202X, Code Verification in Computational Fluid Dynamics; AIAA G-095, Guide to Safety of Hydrogen and Hydrogen Systems; and AIAA R-091A-2020, Calibration and Use of Internal Strain-Gage Balances with Application to Wind Tunnel Testing.

NASA serves as the secretariat for Consultative Committee for Space Data Systems (CCSDS) leading the Spacecraft Onboard Interface Services (SOIS) committee with multiple standards development activities. The SOIS approach is to standardize the interfaces between items of spacecraft equipment by specifying well-defined standard service interfaces and protocols which allow standardized access to sensors, actuators, and generic spacecraft functions, allowing spacecraft applications to be developed independently of the mechanisms that provide these services.

NASA subject matter experts also support IPC—Association Connecting Electronics Industries to ensure that the technical and training requirements in the Space Addendums to IPC documents (e.g., IPC-6012xS, J-STD-001xS, and IPC/WHMA-A-620xS) continue to meet or exceed the baseline requirements of equivalent NASA specifications. NASA continues to participate in re-registration audits for ISO 9001 Quality Management Systems, in ISO 14001 Environmental Management Systems inspections and compliance activities, and in OSHA's Voluntary Protection Program (VPP) assessments. Various other audits and follow-ups included internal quality, safety, environmental, and health inspections, including those for explosives, pressure vessel systems, propellants, pyrotechnics, radiation, environmental compliance, and occupational health.

NASA expertise and experience will or is expected to be used in the assessment of national and international commercial human spaceflight standards, though the maturity of these standards is still in early stages of development. Current NASA documentation exists as Commercial Crew and Human Landing System (HLS) requirements documents.

Standards are critical in defining engineering, safety and mission assurance, and health and medical requirements for NASA missions. These technical standards include, but are not limited to, VCS cited in NASA directives and technical standards, other government agency standards, NASA technical

standards, NASA-endorsed standards, and related standards information such as lessons learned and application notes relative to specific standards. Access to authorized personnel Agency-wide is provided to over 32 VCS Standards Developing Bodies via subscription and on a pay-per-document basis with the capability to order additional standards as the need arises.

Evaluation of the effectiveness of this policy and recommendations for any changes:

OMB Circular No. A-119 is effective, and NASA has no recommendations for change.

2. Please list the government-unique standards (GUS) your agency began using in lieu of voluntary consensus standards during FY 2024. Please note that GUS which are still in effect from previous years should continue to be listed, thus the total number in your agency's report will include all GUS currently in use (previous years and new as of this FY):

This agency reports voluntary consensus standards usage on a categorical basis. The list of NASA Technical Standards is listed on the NASA Technical Standards Webpage: NASA Technical Standards | Standards