Change log for SPD-41a:
Scientific Information Policy for the Science Mission Directorate

September 26, 2022

This document provides a list of the significant changes in SPD-41a from the original version, SPD-41, released in August 2021. The changes may be due to new federal guidance, recommendations from the national academies, best practices in the community, discussions in the Open Source Science Initiative Council (OSSIC), the Science Management Council (SMaC), or feedback from the RFI.

General Changes

The document has been significantly edited to provide greater clarity and further information. These changes have been made throughout the document and include consistent use of terms and further definitions. Significant changes will be described in each section.

The sections in the document along with the items in the document have been rearranged to increase readability. This includes adding new sections on the Data Repositories, SMD-specific guidance, and Scientific events. In addition, further guidance has been included in the Appendix to provide further guidance relevant to data repositories, levels of data, and software.

The following email address has been added for the submission of questions on the policy HQ-SMD-SPD41@list.nasa.gov.

Changes to Section II. Applicability

Item	Change	Comment
II	Definition for scientific utility	Many RFIs had questions on the definition of scientific utility. We have provided a definition in the Appendix and that further guidance and examples will be provided by the divisions to meet the needs of their communities.
II.A	Updated language	The description for both Mission and Research scientific information was expanded to include further descriptions of the type of activities.
II.A.c	Added clarification on applicability	Added note that unless otherwise specified, these types of activities are expected to follow the same requirements as for Research scientific information.
II.B.c	Added definition of scientific software and clarified exceptions.	This change was made in response to RFIs requesting clarification over the inclusion of the term scientific utility in software. The policy has been updated to indicate where scientific software is expected to be shared.

II.C	Added additional rules and regulations that identify restricted information.	Moved from SPD41.II.E

Added in response to RFIs, feedback, or updated guidance including policies or laws related to patent protections, control software, and CUI |
| II.D | Added order of precedence | Added item that this policy does not take precedence over requirements of the FAR and NASA FAR Supplement or requirements in NASA policy |
| II.E | Included item on applicability to future or current missions | Moved from SPD41.II.C

Existing missions already should already include the requirements in SPD-41 in their mission requirements, and SPD-41a is meant to be a forward looking policy. As such, a statement is added on those expectations.

The milestone of KDP-B is to set a marker between current and future missions in response to an RFI. Missions that have not completed their KDP-B review within 3 months of adoption of this policy are expected to follow this policy.

We also added the policies relevance to current or existing requirements or contracts that would take precedence over the policy. This was in response to feedback from the missions and the RFIs. |
II.E.iii	Added applicability to instruments on SMD-led Missions.	Added to clarify how this policy would apply to partner contributed instruments on SMD-led missions. Partner-contributed instruments are expected to follow this policy.
II.F	Moved from SPD-41.II.C	
II.G	Moved from SPD-41.II.E	The reference to the Freedom of Information Act was also moved from this item to II.C.
II.H	Moved from SPD-41.II.F	

Changes to Section II. General Policies

III.A	Changes to the policy on publications.	Remove 12 month embargo period and require publications to be available at the time of publication.

Remove requiring authors deposit the manuscript in PubSpace. This is in response to updated implementations of NASA policy related to public access of publications due to the signing of the agreement with CHORUS. |

III.B	Moved from SPD-41a.V.A	
III.C	Move from SPD-41a.III.B	
III.C.i	Added data should be FAIR	This is a recognized best practice in the data archiving community. As FAIR practices in our communities are still being defined, this is a recommendation and not a requirement.
III.C.iv	Added open formats	This is a requirement of the Open Data Act. Changed convenient to non-proprietary in response to an RFI.
III.C.v	Added SMD data shall be findable	The data shall be able to be retrieved, downloaded, indexed, and searched.
III.C.vii	Added CC0	The creative commons license is recognized to commit the data to worldwide public domain. It is commonly used and understood in the community and compliant with the Open Data Act. It provides clarity on the license as requested in an RFI.
III.C.viii	Added PID for data	This is a best practice both to makes sure data is citable and to encourage users to cite the data.
III.D	Moved from SPD-41.III.C	
III.D.i	Added clarification on restricted software	In response to RFI, clarified that these do not apply for restricted software.
III.D.ii	Added best practice	This encourages users to learn about the best practices in their community to make their software relevant in the most practical ways and following best practices.
III.D.ii	Changed to shall	When there are no other restrictions, the software developed with SMD-funding must use a license that allows the broadest re-use. In response to an RFI, the clause 'if no other restrictions' is in place for cases where source code with a proprietary license or GPL license might be included that would limit the use of a permissive license.
III.D.iii	Added licenses	In response to an RFI, added specific licenses that should be used. This is added as a recommendation and users can still select an appropriate license for their project.
III.D.iv	Added requirement for a code of conduct and contributor guidelines	Code of conduct for software projects is in line with SMD requirements for code of conducts on teams and events.

| | | A contributor guides is an inclusive practice to clarify how to participate in the repository.

Clarified that this only applies to software projects in response to RFI. |
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| III.D.v | Added requirement about where to release the software | When software is released, it must be made available in a place that is appropriate for the community to find it and will provide preservation of that software. |
| III.D.vii | Added PID | Indicated that having a permanent identifier is a requirement for software to make it citable and to assure credit is attributed to the developers.

Encourage users to cite software as a recommendation. |
III.E	Move from SPD-41.III.D	
III.E	Added software	Clarified reporting requirement for software as an invention in response to RFI and added link to invention.nasa.gov.
III.F	Moved from SPD-41.III.G	
III.G	Added software management plan	Software was previously included as part of the data management plan. This splits it into its own section that can captured as part of the proposal. This makes it easier to track data and software in the management plans.
III.H	Added user identifier	This adds the requirement for user identifiers such as ORCID in line with executive order and OSTP requirements.
III.I	Added information on where to archive scientific information	This adds information on where information shall be archived.
III.J	Adds peer reviewed data and software	Peer reviewed data and software are added as first class research products in response to the National Academy reports.

Moved to this section in response to an RFI |
| III.K | Moved from SPD41.VI.B | |
| III.L | Moved from SPD41.VI.A | |

Addition of Section IV. Policies and Principles Applicable to the Science Mission Directorate

IV	Added Section IV	This section was added to group together those policies that are directly applicable to the Science Mission Directorate.
IV.A	Moved from SPD-41.III.I	
IV.A	Add SMD support	In response to an RFI, this clarifies that SMD will provide funding to support these requirements in the budgets provided in proposals.
IV.B	Added requirement on the divisions	Each division will provide their own further guidance in the form of data policies or handbooks that provide the details of information that it will provide.

Added in response to an RFI. |
IV.C	Moved from SPD-41.III.H	
IV.D	Adds PID for funding	This adds a requirement on SMD to supply PIDs for funding. This will enable citation of funding mechanisms that will enable improved tracking for grants and projects along with allocating credit.
IV.E	Moved from SPD-41.III.J	
IV.F	Added expectation on data access for participation in partner-led missions	This adds an expectation that SMD should only participate in partner-led missions where the data are openly shared with no period of exclusive access to the data. A period after the data have been obtained may be allowed for activities such as calibration and validation of the data. This period should be as short as possible but no longer than six months.

It is SMD's intent to require openly shared data, with no period of exclusive access to the data, in a future version of this policy. A notice period of 12 months will be provided prior to making a change to the requirement on participation in partner-led missions. |
| IV.G | Moved from SPD-41.III.K | |
| IV.H | Moved from SPD-41.III.L | |

Addition of Section V. Policies Applicable to Repositories of Scientific Information

V	Added Section V	This section was added to group together all items related to the repositories of scientific information
V.A	Add data repository characteristics	This was updated to be in line with recently released report for OSTP on data repository characteristics.

		Previous version had a requirement that repositories store data for 25 years, but this was removed in response to RFIs
V.B	Moved from SPD-41.III.E	
V.C	Moved fom SPD-41.III.F	
V.D	Added requirement on Authorization to Operate or MoU for data repositories	This requirement was already part of the NASA Cybersecurity and Privacy Handbooks and being added here for completeness.

Changes to Section VI Additional Policies for Mission Information

VI	Moved from SPD-41.IV	
VI.D	Moved from SPD-41.IV.E	
VI.D	Clarifies software release process for Missions	Missions often tailor how their software is released, and this is included in contracts or mission requirements. The comment is added to clarify that this is an option for missions. This also clarifies the expectations on the release of Mission software when developed by NASA. Based on feedback from the RFI
VI.E	Adds open development for mission software	This adds an open development requirement for SMD Missions. Open development has already been shown to be very successful mode of operations for our missions software. This increases reuse and reproducibility for mission software while increasing efficiency by adopting open development practices. An example is the JWST scientific calibration software. Clarifications added due to RFI feedback.

Changes to Section VII Additional Policies for Mission Information

VII	Moved from SPD-41.V	
VII.A	Adds release of data at the end of the research award	Requires the release of scientific useful data to the end of the award. Further guidance to be provided by divisions on examples of the type of data to be released (e.g. observations made that are not released elsewhere, data described in the data management plan). This sets the expectation for research data in line with the OSTP memo on availability of Federal funded research products.

VII.B	Added model and simulation data	This is added for clarification. Further guidance to be provided by divisions is still needed on what aspects of model and simulation data need to be shared. Added based on feedback from the RFI to provide clarity
VII.C	Moved from SPD-41.V.B	
VII.C	Changed to shall	The NASEM report on Open Source Software for NASA recommended a transition process starting in 2018 to move towards open source software for SMD. In ROSES 2020, all divisions moved to software should be open source and SMD has had solicitations that support open source software. This now moves to a mandate for openness for new grants that would be submitted in ROSES23. As compliance mechanisms for SDP-41a only start in 2025, this would give the community 5 years from when software was recommended to being open to when it is mandated to be open. This is in line with the recommendations from the NASEM study. Some divisions and solicitations already require full openness of software, many journals in the community recommend or require it, and many in each of our communities are already compliant.
VII.C.ii	Clarification on enhancements	This provides a clarification on enhancements to software funded by SMD based on feedback from the RFI. Enhancements to software should be released, but they are not required to be released as part of this policy.
VII.C.iii	Added software written in proprietary languages	Added that software written in proprietary or commercial languages also need to be released. SMD does not have any requirement on what languages or tools that are used but some divisions may. Added based on feedback from the RFI.
VII.C.iv	Added note on maintenance	Added the expectation on the maintenance of the software that is released from SMD to minimized the burden. Added based on feedback from the RFI.
VII.D	Added release of software at the end of the award	Requires the release of scientific useful software to the end of the award. Further guidance to be provided by divisions on examples of the type of software to be released (e.g. software described in the software management plan). Added based on feedback from the OSSIC

VII.E	Added note on variances to this section	The policy delegates the authority to issues variances of less than one year to the program office to items in this section. Variances longer than 1 year require review by the CSDO.

Changes to Section VIII Additional Policies for SMD-funded Science Events

VIII	Replaced SPD41.VI	Section VI in SPD-41 was removed as the items were moved to the general policy. It was replaced with this section on science events.
VIII.A	Added requirements for SMD-funded science events where SMD is the primary sponsor	The information shared during science events has value and we want the information presented publicly to be shared as widely as possible. Text was updated significantly due to feedback from the RFI.
VIII.B	Added requirements for SMD-funded participants	The information shared during science events has value and we want the information presented publicly to be shared as widely as possible.
VIII.C	Added guidance for SMD-funded science events where SMD is not the primary sponsor	The information shared during science events has value and we want the information presented publicly to be shared as widely as possible.
VIII.D	Added guidance for private science events	Events organized by Mission or Research teams provide an opportunity to share the progress and results being made by those teams. The teams should consider what information produced for those events should be shared more widely to increase accessibility and inclusion.

Changes in the remainder of the policy

IX	Moved from SPD-41.VII	
IX.A	Update to Variances	The Variances section was updated to provide a process for requesting and approving of variances. This also includes clarity on the different roles as part of the variance process.
X	Added Measurement and Verification	A section was updated on the measurement of metrics associated with the policy and the review period for the policy.
Appendix D	Added appendix on characteristics of SMD repositories	An appendix was added on characteristics of acceptable data repositories. This was updated based on recently released OSTP Desirable Characteristics of Data Repositories for Federally Funded Research.

| Appendix E | Levels of Mission Data | An appendix was added on levels of mission data. This can be used for reference in the different divisions. |
| Appendix F. | Guidelines for sharing software | This is a section added in response to the RFI that provides additional information about different types of NASA software and expectations on how it should be shared. |