

**Response to RFI: Implementation and Changes to Science Policy Document (SPD)-41:  
Science Information Policy on behalf of the Mercury Exploration Assessment Group  
(MExAG) community.**

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**Brief summary**

The Mercury Exploration Assessment Group (MExAG) is a community-based, interdisciplinary body responsible for providing science input and analysis needed to plan and prioritize Mercury research and exploration activities. During its annual meeting in February 2022, MExAG adopted a formal finding on SPD-41 that supports the ideals of the policy and expresses a set of significant concerns regarding the combination of its ambiguous language and particularly the inequitably distributed burdens that the proposed changes place on the community. MExAG encourages NASA to collaboratively develop a comprehensive set of initiatives with the science community to assess both these differential burdens and how to build an equitable and effective implementation of the policy.

**Response**

The Mercury Exploration Assessment Group (MExAG) is a community-based, interdisciplinary body responsible for providing science input and analysis needed to plan and prioritize Mercury research and exploration activities [1]. During the annual meeting held Feb 1–3, 2022 [2], the community had an open discussion about the changes and implementation of SPD-41. As a result of those discussions, MExAG generated a formal Finding regarding SPD-41 that was then presented to the Planetary Science Advisory Committee on Feb 15, 2022 [3].

MExAG's Finding on SPD-41 states:

MExAG supports increasing the openness and reproducibility of science, the primary ideals behind SPD-41.

MExAG recognizes that the policy is currently open for public comment, but also emphasizes that as currently written, SPD-41 is vague and ambiguous. Examples include which software “provide users some degree of scientific utility” and must be archived, as well as how software and data produced under a combination of NASA and

non-NASA (including non-governmental) support shall be treated. MExAG encourages NASA to make the policy sufficiently precise that it can be implemented.

MExAG also encourages NASA to consider, in collaboration with the scientific community, a comprehensive set of policy initiatives to develop effective implementations that both encourage greater openness and interoperability, while balancing the potential for increased costs and stress on the R&A programs. Such steps should also include an assessment of how SPD-41 implementation differentially impacts various elements of the community, as well as how to implement a process that is equitable in its expectations and burdens.

MExAG's Finding relates to both Aspect One ( areas that will be affected by changes in SPD-41) and Aspect Two (areas needing support for SPD-41 to be implemented).

With regard to Aspect One of the RFI, the development of the MExAG Finding on SPD-41 was in direct response to concerns raised about (a) the ability of the Policy to be effectively implemented (because of its imprecise language) and (b) the considerable differential burdens that the proposed changes will impose within the planetary science community.

Proposed change B.d. (standards-compliant metadata requirement) is an example of a proposed change with significant prospects for differential burdens on the community because of the wide variety of data collected and produced within the planetary science community. Data types, quantities, and product-level (i.e., from raw, to calibrated, to reduced data types) created in the course of conducting research vary considerably across research domains. Those domains capable of producing massive data products (e.g., high-performance computing-based work, high-throughput remote sensing and laboratory analyses) will have differential burdens resulting from this policy relative to those that produce smaller volumes of data. Those impacts are both in terms of effort (i.e., the fraction of time spent on meeting metadata standards requirements relative to that spent on producing, analyzing, and communicating the research), and in terms of funding required to complete the data work necessary to meet the metadata standards (i.e., budgets of proposals for projects with substantial metadata curation requirements should be expected to grow at a greater rate than those with smaller such requirements after the implementation of this proposed change). Relief of these differential burdens is essential.

Proposed changes to Part C (software) are examples of changes that will impose differential burdens within the community by requiring the research apparatus built to conduct computationally focused work be fully open, which is in contrast to the physical apparatus of non-computationally focused work that for logistical and safety reasons cannot be fully open. Inequitable expectations lead to inequitable impacts on, and opportunities for, individuals.

Proposed change E.e is a reasonable goal for maintaining the integrity of NASA-supported research. However, it is incumbent upon NASA to ensure that this requirement can be met

through a combination of the availability of appropriate resources and providing funding for the depositing of datasets in repositories that may have costs, especially for very large datasets.

With regard to Aspect Two of the RFI, needed support and tools, MExAG was encouraged that Proposed change E.d identifies the responsibility of NASA to support the implementation of the proposed changes to SPD-41. However, the RFI's goal in Aspect Two of identifying the needed support and tools through this RFI is an insufficient measure to ensure that SPD-41 can be implemented. Rather, the MExAG finding encourages SMD and its divisions to work collaboratively with each of their subcommunities to identify efficient and effective policy implementation strategies. Such a collaborative approach is essential, in large part because the differential burdens on the community need to be thoroughly identified, including the interwoven stresses on both the research community and the R&A program budgets and effectiveness. A careful, thorough, and collaborative process is vital for developing initiatives capable of ameliorating the differential burdens, before SPD-41 can be effectively and equitably implemented.

## References

[1] MExAG Terms of Reference, <https://www.lpi.usra.edu/mexag/terms/>

[2] MExAG Annual Meeting 2022, Feb 1–3, 2022,  
<https://www.lpi.usra.edu/mexag/meetings/feb2022/>

[3] MExAG Presentation to the PAC, Feb 15, 2022,  
<https://science.nasa.gov/files/science-pink/s3fs-public/atoms/files/04-AGs-PAC-Feb2022.pdf>