

Guidelines for GDC STDT: Overview and Anticipated Process

[Updated May 10, 2018]

1. Scope of STDT Charge

The Geospace Dynamics Constellation (GDC) Science and Technology Definition Team (STDT) is established as a subcommittee of the Heliophysics Advisory Committee (HPAC), an advisory committee established under the Federal Advisory Committee Act (FACA).

The STDT will define a compelling and executable mission concept for GDC, which is prioritized by the National Academies' 2013 Decadal Survey for Heliophysics. The STDT will assess the science rationale for the mission and the provision of science parameters, investigation approaches, key mission parameters, and any other scientific aspects needed.

At the end of its work, the STDT will submit a final report to HPAC that contains a description of its mission concept study, design reference missions, and the scientific trade-off between the studied potential mission implementations.

Due to the process defined by its establishment as an HPAC subcommittee and the programmatic needs of NASA, the STDT will include and exclude certain topics from its consideration.

1.1. Topics for STDT's Consideration

As part of its charge to conduct a mission concept study, the STDT is expected to include the following topics in its consideration. This list is not intended to be exhaustive, but rather descriptive of the topics that would be reasonably included to meet NASA's programmatic needs.

1. The GDC science goals and objectives. These will start with the Decadal Survey-recommended goals and objectives, but refined and focused in light of scientific advances since the Decadal Survey's publication and in order to ensure that the GDC mission concept is compelling and executable.
2. The science goals and objectives of other Decadal Survey-recommended missions that overlap with GDC's science objectives and could be met within the GDC mission concept.
3. The scientific measurements required to complete the defined GDC science objectives, including physical parameters (e.g. relative abundances) and particular observables (e.g. species densities). In instances where multiple observables could meet the needs of a particular physical parameter measurement, the STDT shall list the applicable observables to the best of its ability. These measurements may be specified by the Decadal Survey or may have been recognized as necessity since the publication of the Decadal Survey.
4. Possible mission architectures that would enable the GDC mission to successfully meet its scientific objectives. This includes but is not limited to number of spacecraft, orbital

parameters, spacecraft (non-)heterogeneity of scientific measurements, and generic spacecraft bus types (e.g. small satellites, CubeSats).

5. Ground-based observations (e.g. all-sky imaging), non-observation capabilities (e.g. modeling), and data archives that would enhance or enable the success of the GDC mission concept.
6. Potential scientific synergy between GDC and other planned or currently operating missions (both NASA and non-NASA).
7. GDC-relevant space weather science goals that could be met within the mission concept without compromising the successful completion of the GDC science objectives.

1.2. Topics not for STDT's Consideration

A number of topics will be excluded from the STDT's consideration. These topics will be redacted from any public input to the STDT and will not be discussed by the STDT. The STDT report will not include advocacy, either for or against, or recommendations about any of the following topics. Due to the dynamic nature of the STDT process, NASA may modify this list as appropriate.

1. Particular instrument types, instrument builds, non-spacecraft capabilities (e.g. models, ground-based observatories). While some measurement requirements have generally been met by particular instruments, the STDT shall not recommend those particular instruments to the exclusion of other instruments (or combinations thereof) that could meet the requirement of measuring particular physical parameters.
2. The method, structure, content, or target of any mission formulation activity. This includes the direction, competition (e.g. AO, RFP), or invited contribution (e.g. from international partners) of mission components (e.g. spacecraft, instruments, inter-mission collaboration).
3. Any procurement activity in support of the mission formulation activity. In instances where a need or opportunity outside of the mission concept is recognized, the STDT shall identify for NASA to address.
4. Mission development costs or mission budget targets, either projected or recommended. All needed budgetary constraints will be provided by NASA.
5. Any provider-specific bus or bus type.
6. Any specific launch vehicle or launch strategy. In instances where a design reference mission requires the launch or deploying of multiple spacecraft, NASA will provide launch constraints.
7. Any potential NASA collaborations with specific US or non-US organizations.
8. Any space weather operational goals or requirements.

2. Organizational and Preparatory Pre-work

The STDT shall engage in organizational and preparatory pre-work ahead of the in-person meetings as needed to successfully complete its work.

3. In-person Meetings

The STDT shall meet for in-person meetings at least three times. These meetings shall be open to virtual attendance by the public, although the format of the meetings will not facilitate public comment during the meeting itself (see Section 5.2).

The STDT's first meeting will focus on the science goals and objectives for the GDC mission.

The STDT's second meeting will focus on scientific measurement and mission requirements to meet the defined science objectives. This discussion will also include possible mission architectures for study by NASA's engineering support (Section 6).

The STDT's third meeting will focus on examining the design reference missions in order to describe their scientific trade-offs and draft recommendations for the report to HPAC.

4. Input to and Comments for the STDT

NASA encourages the public to submit material to for the STDT's consideration. In late 2017, NASA released a Request for Information (RFI) that invited comments relevant to the GDC mission concept for conveyance to the STDT. Further, NASA invites public comments during the STDT process and has provided an email address via a public GDC STDT webpage to receive those comments.

4.1. GDC STDT RFI Responses

In late 2017, NASA published a RFI that it could deliver to the STDT as input for its consideration. NASA received 65 responses and has conveyed all of those that contain scientific and/or technical material not excluded from the STDT's consideration (Section 1.2). Responses that contained both material appropriate for the STDT and material excluded from the STDT's consideration had the latter material redacted before conveyance.

In order to help the STDT better navigate the information provided in response to the RFI, NASA has performed an indexing of the responses. This indexing is intended to be a rough guide to help the STDT members organize and prioritize their reading of the responses; it is not intended to be a comprehensive cataloging of all information contained within the responses.

4.2. Public Comments

The STDT's in-person meetings will be accessible to the public via virtual attendance. At least three business days before the beginning of an in-person meeting, NASA shall post on the STDT webpage instructions on how members of the public can virtually attend the meeting.

NASA solicits public comments as emails submitted to hq-stdt-gdc@mail.nasa.gov; due to the format of these meetings, the public will not be able to comment during the meetings themselves. NASA requests that comments be submitted as PDFs that follow standard formatting practices and are no more 5 pages in length.

Individuals are not restricted from submitting multiple comments but are requested to keep comments focused so as to aid in the STDT's consideration of them. In instances where an individual wishes to comment on multiple, separate items, they are encouraged to submit separate comments. (Although this discussion uses the term "individual", a single comment may just written and signed by a group of individuals, but should only be submitted once.)

While NASA intends to convey all material in-scope for the STDT's consideration, comments that are submitted more than a week after the end of an STDT meeting are not guaranteed to be conveyed in time for full consideration by the STDT and comments that contain significant amounts of material not in-scope for the STDT's consideration (Section 1) may not be conveyed at all. NASA does not intend to respond individually to submitted comments or to inform individuals of the status of their comments, but all conveyed comments will be posted on the STDT webpage in their redacted form.

Individuals that wish to submit comments solely for NASA's consideration are welcome to do so, and are asked to place "FOR NASA'S CONSIDERATION ONLY" at the top of the comment PDF. Nothing in the submitted comment will be conveyed to the STDT.

5. Mission Design Laboratories

As part of its support of the STDT, NASA has contracted the support of mission design laboratories (MDLs, also referred to as concurrent engineering laboratories). The MDLs will produce design reference missions and perform trade studies at NASA's direction. These tasks will use scientific requirements (e.g. prioritized measurements, mission parameters) produced by the STDT and any applicable programmatic constraints (e.g. budget, operational lifetime) defined by NASA.

6. STDT Reports

As a subcommittee of HPAC, the STDT will deliver all reports to HPAC, who will make them publicly available upon acceptance.

In addition to any other location determined by HPAC, approved reports will be made available on the GDC STDT webpage: <https://science.nasa.gov/heliophysics/resources/stdts/geospace-dynamics-constellation>