

Policies for the Telescope Time Review Board (TTRB): Repeating HST Observations, Changes to Accepted HST Programs, Resolution of Duplications, and Other Program Alterations

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ABSTRACT

This document presents STScI policy for granting formal changes, additions, and alterations to accepted HST programs, as well as for repetitions of failed observations. Three types of requests may be made by a General Observer, Guaranteed Time Observer, Instrument Scientist, or Program Coordinator. All are made using a web tool. The first type is an HST Operations Problem Report (HOPR), which describes an operational problem that occurred in obtaining data and which generally requests a repetition of the lost observation. The second type is a Program Change Request (PCR), which asks for specific alterations to upcoming observations that are significant enough to warrant official approval (such as a change of instrument or a change to the orbit allocation). The third type is a request for Resolution of Data Duplication (RDD), which is a request to adjudicate an apparent duplication in use of HST or a conflict of data rights.

1. The Process for Reviewing Program Changes

Changes to approved HST programs are evaluated, discussed, and reviewed by the Telescope Time Review Board (TTRB), which is composed of staff members from the STScI divisions that schedule the telescope and support science observations.

The TTRB makes recommendations based on the policies in this document. The TTRB exists to maximize the science return of HST within approved policy, but has limited latitude to deviate from established precedent. TTRB recommendations are forwarded to the Head of the Science Policies Group (HSPG; Claus Leitherer) for approval. Following this review, the TTRB acts to carry out the final decision that has been made.

1.1 The Domain of the TTRB

Observing time on HST is allocated by the Director of STScI. Ordinarily this is done in one of three ways:

1. Through a Call for Proposals, with review by a TAC;
2. Following a submitted proposal for Director's Discretionary Time, after suitable scientific review;
3. Through an internal review of calibrations that are requested and defined by the Science

Instrument (SI) groups.

(Some HST time is allocated in other ways, such as engineering time, but that is not important here.) Each of the above three ways leads from a submitted *proposal* to an approved *program*, with a specific allocation of HST time, ordinarily in units of orbits. Also, specific programs are approved to observe specific targets with particular instrument modes and parameters. After a proposal is approved, a detailed Phase II program must be written, which is then accepted for execution on the telescope.

Inevitably changes must be made in some programs after they are accepted, and the TTRB exists to review these and make recommendations to the HSPG, who may approve on behalf of the Director's Office. Some of the reasons for changes include:

1. Failure of an observation. The failure or anomaly may have occurred during program implementation, in the ground system, or as a problem on the spacecraft.
2. Alteration of a program to use a different filter, grating, or even a different instrument.
3. Addition of a new target to a program or changing one target for another. Target swaps may ordinarily be approved by an Instrument Scientist (IS), but adding a new target needs TTRB review.
4. Changes that result from knowledge of the SI or telescope that was not available at the time the proposal was written, requiring, possibly, additional telescope time to achieve the approved science goals.

Some of these changes are minor and need only the approval of an Instrument Scientist, but major alterations to a program require formal approval.

2. Types of Program Alterations Treated

2.1 Reporting Mechanisms and Procedures

Matters come to the attention of the TTRB through a formal reporting mechanism that is invoked using a web page. The PI, or his or her designee, enters basic program information, an explanation of the nature of the action requested, and the reasons for the action. The web submission software adds additional program information from a database, and the members of the TTRB are notified that a new request has been submitted through automatic e-mail.

The Chair of the TTRB, in collaboration with the other members of the TTRB, reviews the request and prepares a recommendation. An IS and/or PC, and/or other STScI experts, may be consulted as needed during this review. After the appropriate consultation has taken place, the Chair may, if necessary, request further information or clarification from the PI. The recommendation of the TTRB that was reached through this process is communicated by the Chair to the HSPG for concurrence. In some cases, the HSPG may modify the recommendation. Upon concurrence, the Chair of the TTRB notifies the PI of the outcome.

2.2 Types of Issues Treated

All the issues treated by the TTRB are reported with the same mechanism, and at the time it is submitted it is assigned a tracking number through the STScI Problem Reporting System, of the form HOPR Number 12345, Duplication Report Number 12345, or Change Request Number 12345. A different form exists for each type of request. The web links for each type can be found on the Program Information page for the program in question (http://www.stsci.edu/hst/scheduling/program_information).

HST Operations Problem Report (HOPR)

Proper documentation of HOPRs is vital for follow-on studies that enable us to reduce causes of failed observations. Policies and procedures for HOPRs are well established and are described below in Section 3.

Program Change Request (PCR)

Most changes to programs that are made after submission and acceptance are minor alterations, such as changing an exposure time, using a different filter, or adding certain Special Requirements. These types of changes may be approved by an IS without further review, and some may be implemented by the PC. For those PCRs involving Bright Object Protection or other instrument technical issues, the relevant Instrument Team will be consulted and may provide a recommendation to the TTRB on the resolution of the PCR.

At some point, however, a program change is clearly significant or has the potential to be. In these instances the PI or IS needs to initiate a formal Program Change Request, using the web tool described above. These types of alterations ordinarily require a PCR:

1. Increasing the allocation of primary or parallel orbits above the numbers allocated by the Director. Requests for increases in primary orbits will be rare and will require strong scientific justification.
2. Contesting a mandatory comment made by the TAC.
3. Adding a target to a program. Reallocation of time among an already-approved list of targets (i.e., if they were specified in the Phase I Proposal) is at the discretion of the PC or IS. The IS may also approve the substitution of a target that was specified in the Phase I Proposal for one that was not, provided the new target does not create a duplication with other approved observations, and the observation of the new target does not alter the original science goals of the program.
4. Changing instruments or a significant change of instrument mode (such as from STIS to the ACS).
5. Adding limited-resource Special Requirements that were not indicated in the Phase I proposal. These include CVZ, TOO, SHADOW, and LOW SKY.
6. Adding other options, parameters, or Special Requirements that substantially increase the constraints on scheduling a program.
7. Any change that *requires* an observation to be made outside of the nominal start or end times of the Cycle for which it is approved, or any request by a PI to start a program before the start, or after the end, of the Cycle. Multi-year programs are, by definition, pre-approved to extend beyond a single Cycle boundary.

STScI's concerns are in two areas. First, we wish to understand if a change significantly alters our ability to schedule an observation. Using STIS, say, instead of ACS can be such a case, as are use of limited resource Special Requirements. Second, the Institute needs to ensure that a change does

not go beyond the scope of the program originally proposed and does not infringe on the science of another program.

Resolution of Data Duplication (RDD)

A GO, IS, or PC can file an RDD whenever they feel that two separate observations in separate programs may duplicate one another, or if there are conflicts in data rights that arise.

We will expect GOs to investigate for other current-Cycle programs that may conflict with their own, and the RDD is the mechanism for adjudicating these.

3. HOPR Procedures

A HOPR is completed via a web page, and is ordinarily submitted by an observer, but may also be submitted by an Instrument Scientist (IS) or Program Coordinator (PC), or, possibly, a Co-I, especially one who happens to be an STScI staff member. In any of these cases the HOPR will be considered to have been effectively submitted by the PI. A HOPR is submitted when a problem is found with the observation, either in the way the observation was (or was not) executed, or in the data received.

3.1 Automatic Repeats

A HOPR generally requests that an observation be repeated, but some failures are of a nature which makes a HOPR unnecessary. Such errors are identified immediately after the observation fails and are automatically rescheduled. However, an automatic rescheduling only occurs if the visit had no science data at all obtained and no guide star acquisition was attempted. Failed observations that have been automatically rescheduled are made known to the TTRB for nominal review.

Failures which are eligible for automatic repeat are

1. Visits affected by a spacecraft or instrument safing event, as long as the entire visit was lost and as long as the program itself did not cause the safing.
2. Visits lost due to other spacecraft malfunctions, as long as the entire visit was lost and as long as the program itself did not cause the malfunction.

3.2 Policies for Granting Requested Repeats of Observations

Type of Observation

Repeats are not normally granted if the failed observation was a SNAP observation.

Completeness of program

Repeats are not ordinarily granted if a program is already 90% complete. "Complete" here means that 90% or more of the orbits allocated to the program have been successfully executed at the time the HOPR is evaluated. Scheduled observations that have not yet executed are not ordinarily counted as "complete," although they may be in some circumstances as, for example, when the lifetime of an instrument is near an end and the remaining schedulable time is highly constrained.

The failure of less than 10% of a program's orbits is *not* grounds for automatic rejection of a HOPR. However, a HOPR that requests more than 90% completion needs to indicate clearly why the repeated observations are essential to achieving the scientific goals outlined in the original proposal.

Incorrect target coordinates

A program's Principal Investigator (PI) is responsible for generating target coordinate charts in APT so that the PI may verify the coordinates of the target being observed. (Charts for moving targets are generated at STScI and provided to the PI as they can not be generated in APT.) Some targets (especially bright ones) may be difficult to evaluate on these charts, but in all cases the PI remains responsible for supplying complete and correct target coordinates in the proper units, and the source of those coordinates must be included as well. In the case of targets with significant proper motion, the PI is responsible for providing both the epoch of the coordinates and the proper motion values in the correct units. Therefore, HOPR requests that involve incorrect target coordinates or proper motion values are not ordinarily approved.

Program error by STScI

If the observation failed due to an error originating within STScI, or an operational problem with the telescope, repeats are ordinarily granted. In some cases, such as instrument failures or other hardware problems, repeats may be undertaken automatically.

Program error by PI

If the failure was caused by an error that can be shown to originate with the PI (or his or her designee), then a repeat will not be granted. STScI attempts to detect observer error on a best-efforts basis, but errors nevertheless remain the PI's responsibility.

High-risk observations

Some accepted programs are unusually difficult to implement or may face a higher-than-normal chance of failure. In these cases the PI will be notified before the observations are obtained, and the observations are then executed on a shared-risk basis. This means that repeats will not ordinarily be granted if an observation fails. In some cases, high-risk programs may be brought before the TTRB before they are implemented.

3.3 Release of Data

Under most circumstances, if a repeat is granted then the original ("failed") observations will be made immediately available to the public in the archive. If a repeat is granted for an entire program, then all of the data acquired so far are released. The intent is that if the observations are good enough to do the science that the PI proposed then they should not be repeated, and that a PI should not be given preferential access to duplicate observations. Thus if a repeat is given, the data are acknowledged to be inadequate for the original purposes and may therefore be made freely available without impairing the PI's science goals. The PI may request a repeat with no release of the original data, but supporting arguments must be provided.

3.4 Deadlines for HOPR Submission and Program Resubmission

HOPRs must be filed within 90 days of the date when the affected observations failed. A repeat will not be granted if this period is exceeded unless the PI can provide clear evidence of why it was impossible to file the HOPR within the 90 days. In cases where the end of an operating mode is imminent (e.g., when an SI is to be removed in an upcoming Servicing Mission), a specific HOPR deadline may be imposed beyond which no HOPRs whatsoever for that instrument will be accepted simply because repeats cannot be scheduled.

If a repeat has been granted, the PI has six weeks in which to supply a revised Phase II program. If no changes to the original observation are needed, a new submission is not necessary, but the PI must still contact the PC to so indicate.

3.5 Change Requests Within HOPRs

A request to repeat an observation may also include a request to change the way in which the observation was obtained or the target observed. Such change requests after the fact are unlikely to be granted unless convincing arguments are presented that **require** the changes to be made to the observing plan (as opposed to changes that improve the observing plan). In other words, Change Requests should be filed well before observations are taken.

4. Program Change Requests (PCRs)

A formal PCR should be filed whenever an alteration to a program significantly changes its ability to be scheduled, if a limited resource is requested, or if a change might result in a data conflict or duplication issue. Some reasons for filing PCRs were listed above in Section 2.2.

4.1 Late change requests

A Change Request to a program must reach STScI at least four weeks before the first day of the planning window for that proposal. If a Change Request is received after this date and the observations then fail because the change was not implemented, no repeat will be given. Even if STScI agrees to attempt a late implementation of a Change Request, it is done on a best-efforts basis and the PI is still responsible for the error if problems arise.

5. Duplication or Data Conflict Resolution

An RDD is the mechanism for bringing a duplication to the attention of the TTRB. The grounds for declaring a potential duplication are established elsewhere (see the most recent *HST Call for Proposals*).

Applicable Policies

This document has listed the policies that apply to HOPRs, PCRs, and RDDs. However, these policies may change from one Cycle to the next, and the policy applicable to a specific program is generally that given in the *Call for Proposals* for the Cycle in which the program was accepted. CPs from previous Cycles may be found on the STScI web site.