

# **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 request may be made by a General Observer, Guaranteed Time Observer, Contact Scientist, or Program Coordinator. All are made using a web tool. The first type is a HOPR (HST Operations Problem Report), 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 PCR (Program Change Request), which asks for specific alterations to upcoming observations that are significant enough to warrant official approval (such as a major target change or change of instrument). 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.

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## **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 execute approved policy, and so has limited latitude to deviate from established precedent. TTRB recommendations are forwarded to the Head of the Science Policies Division (HSPD; F. D. Macchetto). 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. GTO time can be considered a special case of #1 since GTO observations are planned in Cycles with GO observations, even if some different rules apply.) 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 Director's Office for approval. 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 the Contact Scientist (CS), 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 a program's Contact 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 it. The web submission software adds additional program information from a database, and the Chair of the TTRB is notified that a new request has been submitted through automatic e-mail.

The Chair of the TTRB then reviews the request and makes a recommendation, possibly after asking a CS or PC to investigate or to supply additional information. The remainder of the TTRB then reads the summary, adds further comments, and the HSPD indicates concurrence or disagreement with the result.

## **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, of the form HOPR-999. The submitter must indicate which type of request is being made:

### *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 (see “HOPR Procedures” on page 4.).

### *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 a Special Requirement. These types of changes may be approved by the CS without further review, and some may be implemented by the PC.

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

1. 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 CS.
2. Changing instruments or a significant change of instrument mode (such as from STIS to the ACS).
3. Adding limited-resource Special Requirements that were not indicated in the Phase I proposal. These include CVZ and TOO.
4. Adding other options, parameters, or Special Requirements that substantially increase the constraints on scheduling a program.
5. Any change that *requires* an observation to be made after the nominal end of the Cycle for which it is approved. Multi-year programs are, by definition, pre-approved to extend beyond a 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 NICMOS, 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, especially GTO programs.

### *Resolution of Data Duplication (RDD)*

A GTO, GO, CS, or PC can file a 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 an “HST Operations Problem Report.” It is completed via a web page, and is ordinarily submitted by an observer, but may also be submitted by a Contact Scientist (CS) 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 with the observations is found, 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 scheduling unit (SU) had no science data at all obtained. 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. Guide star acquisition failures that result in no science data being obtained for the SU.
2. SUs affected by a spacecraft or instrument safing event, as long as the entire SU was lost and as long as the program itself did not cause the safing.
3. SUs lost due to other spacecraft malfunctions, as long as the entire SU 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 or a parallel 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 would be scientifically unique and why they are needed to complete the dataset.

##### *Incorrect target coordinates*

A program’s Principal Investigator (PI) is provided with a chart so that the PI may verify the target being observed. 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. Therefore, HOPR requests that involve incorrect target coordinates 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 guide star acquisition failures, instrument failures, or other hardware problems, repeats are undertaken automatically, and are initiated in the AlertObs system.

### *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 Guaranteed Time Observers (GTOs)**

Failed GTO observations are also reviewed by the TTRB. The PI may choose to have the number of orbits of the failed observation added back to their account instead of having that specific observation repeated. However, if the Cycle in which the GTO program failed was the last Cycle in which GTO programs could be submitted from that instrument team, the program is treated as if it were a GO program and the lost time is **not** returned to the account (but a repeat may still occur).

### **3.4 Release of Data**

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 if supporting arguments are provided.

### **3.5 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 90 days 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.

### **3.6 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, see [“Program Change Request \(PCR\)” on page 3](#).

### **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*), and are brought to the attention of CSs.

## **6. Applicable Policies**

This document has listed the policies that apply to HOPRs, PCRs, etc. 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.