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TITLE

Change Control Procedure

REV. A, ; Updated section 2.0 Practical Implications, added sections 3-5, added Change Request / Notice form

REV. B,

Required Signatures:

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Jay Marx, Project Director

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STAR Note 95

STAR Change Control Procedure

1. Introduction

Over the term of the STAR construction project, it is expected that the design or definition of components will evolve. When components of a system of the complexity of the STAR Detector change without a system of checks and balances, confusion may occur which would affect the technical, cost or schedule outcome of the STAR construction project. The following procedure is meant as a simple means of controlling this natural evolution that will reduce or eliminate change as a source of problems.

This document describes the STAR Change Control Procedure which is one of several elements involved in STAR configuration management. Configuration management for STAR is described in detail in a companion document entitled STAR Configuration Management Plan (STAR Note 94). For further discussion and definition of the terms used here, refer to the Configuration Management Plan.

2. Practical Implications

Items that fall under this Change Control Procedure include the following:

STAR Drawings with revision A or higher
Specifications
Requirements Document / Parameters Notebook
Essential Model with Written Description *
Deliverable List
WBS Dictionary
Implementation Model with Written Description
Interface Specifications

* Suggested by the chief EE at the successful completion of all Preliminary Design Requirements Reviews

2. Practical Implications continued

STAR Detector Technical Baseline Configuration

Per the Configuration Management Plan, a limited set of "controlled documents" will provide the technical baseline of the STAR Detector. The baseline configurations for individual subsystems of the STAR Detector will be defined in the STAR Parameters Notebook, and by the subsystem design drawings and specifications. The baseline configurations of the subsystem interfaces and subsystem envelopes for STAR will be developed and maintained by the Systems Integration Group.

The approved technical baseline STAR Detector has been defined in the CDR dated June, 1992, the update to the CDR dated Feb. 1993 and the Parameters Notebook, dated January 1995. The baseline scope includes the following detector elements or subsystems: TPC, Warm Solenoid magnet, TPC Electronics, DAQ and Trigger, On-line Computing, and Conventional Systems. In addition to the above subsystems, Installation and Test, Project Management and Systems Integration efforts to support the baseline subsystems are part of the baseline.

Three Levels of Change

There are three change control levels as outlined in Table 1. Changes which only affect a single subsystem; do not impact the subsystems interfaces, overall performance, cost, or schedule goals, will be managed and controlled by the subsystem managers and are considered Level 3 changes as shown in Table 1. The detailed procedure by which subsystem managers control these changes will not be discussed in this document, but will be left to their discretion, subject to approval by STAR Management. However, level 3 changes will be tracked by the STAR Project Office.

In practice, this Change Control Procedure will mainly apply to Level 1 and 2 changes. Elements of these changes will possess one or more of the following attributes:

> Physical interface with the rest of the detector - the envelope within which the element will be contained.
>
> Utilities interface - the location, size and rate of "flow" of utilities supplied.
>
> Signal Output interface - the location, number and size of output signal cabling.

Structural interface - the location, number, shape, size, hole pattern, etc. of the element component from which the subsystem is supported or aligned.

Parameters, function and requirements which are used to define the technical scope and specification of the element.

Significant cost or the possibility of affecting the subsystem delivery schedule.

The scope of potential changes varies from the simplest, which may minimally affect things internal to the subsystem with no influence on things external; to the most complex, which may affect other subsystems, affect the total cost or schedule of the STAR project, or impact the scope of physics done with the STAR detector. Table 1 defines the three categories of changes and the method of review and approval level required for each.

STAR Change Control Board

The STAR Change Control Board (CCB), as defined in the Configuration Management Plan, is composed of the same members as the extended STAR Technical Committee and will serve as the review board for level 1 changes:

Chairman: STAR Project Director

Members: STAR Collaboration Spokesperson
STAR Collaboration Deputy Spokesperson
STAR Project Manager and Chief Mechanical Engineer
STAR Chief Electrical Engineer
Cognizant STAR Subsystem Managers

Advisors: STAR Systems Integration Group (MI, EI, FI)
STAR Safety Officer / EH&S Coordinator
STAR Quality Assurance Coordinator
Others as appropriate

Reporting Changes To RHIC

The STAR Management Plan requires that certain changes be reported to RHIC. These changes include a change in the technical capabilities of a RHIC WBS level 3 element i.e. a subsystem, a change in the overall cost of STAR that is outside the scope of STAR's contingency, or an unfavorable change in the STAR control milestones. These changes will be reported to RHIC by STAR management.

Table 1 - Change Approval Level Required

Level	Scope of Change	Reported to STAR Systems Integration?	Review and Approval Level
1	Significantly impacts another subsystem. -and/or- Significantly impacts the technical capabilities of any subsystem. -and/or- Increases the cost by $25k or more or delivery schedule by 2 weeks or more for critical path elements or 4 weeks or more for non C.P. elements of the detector.	Yes	STAR CCB
2	Impacts another subsystem in a minor way (e.g., bolt size at interface). -and- Does not impact technical capabilities of a subsystem. -and- Does not significantly add to the cost or delivery schedule of a subsystem.	Yes	STAR Systems Integration*
3	Impacts only one subsystem. -and- Does not impact technical capabilities of the subsystem. -and- Does not add to the cost or delivery schedule of the subsystem.	Yes (for tracking purposes only)	Relevant Subsystem Manager

* When in doubt, refer to CCB

3. Requesting A Change (all Levels) and Resolution Times

A STAR Engineering Change Request/Notice (ECR/N) form should be used for requesting changes to STAR Drawings and documents outlined in section 2.

To request a change follow these 3 simple steps:

1. Obtain a copy of the ECR/N form (these are available in electronic or hard copy form) from John Sterling in the STAR Project office. A hard copy ECR/N form is included in this document.

2. Fill out all of the required information. Refer to section 5 in this document if necessary.

3. Return the ECR/N form (electronically, fax, or regular mail) to John Sterling. (fax # 510-486-7105)

John will then log the change request into a database and issue a STAR ECR/N number.

For Level 1 and 2 requests, a copy of the ECR/N form with the issued STAR ECR/N number will be returned to the requester. At this time the ECR/N form shall indicate that the request status is "Pending". This will serve as a confirmation notice that the change request has been forwarded to the Integration Group or Change Control Board. After review, an additional copy of the ECR/N form will be returned to the requester with a status of either "Approved" or "Rejected". If an Engineering Change Request is rejected the reason for the rejection will be given.

Level 3 request require no formal review by the Change Control Board or Integration Group however the Integration Manager will informally review level 3 requests to check that the request is in fact level 3 and not level 2 or 1. Because no formal review is required level 3 ECR/N forms will be returned to the requester within a few days and shall indicate that the status is "Approved".

The resolution time for Level 1 and Level 2 change requests is dependent upon the complexity and ramifications of the change. The STAR CCB and Integration Group will work to keep this time to a minimum.

4. Recording and Distribution of Change Information

Once a change has been approved, it should be recorded on all applicable documentation and quickly distributed to avoid later confusion. If a configuration change is not distributed promptly, efforts directed at a related interface may be wasted and repetition may be necessary. To reduce this danger and eliminate confusion, all pertinent drawings should be modified and must include a revision letter. The changes should also be recorded in related STAR Notes along with a revision letter and date. **It is the responsibility of the relevant subsystem manager to see that this occurs in a timely manner.** The modified documentation is then placed in the STAR Drawing files, and/or STAR Note filing system, its revision letter and a revision date recorded. The STAR note system on the W.W.W. will also be updated and will reflect the new revision.

5. Instructions on completing the ECR/N form

Below is a list of the fields on the ECR/N form and information and instructions for completing each field. Items is *italics* are completed by the STAR Project Office.

1. LEVEL
   Use Table 1 as a guide to determine the appropriate tentative change level.

2. *STATUS*
   Completed by the STAR Project Office and indicates the current status of the ECR/N.

3. STAR Drawing or STAR Note #
   Indicate the number of the document that is to be changed. If the document does not have a number this space is left blank.

4. Revision From: / To:
   Indicate the current and future (if approved) revision number or letter.

5. Inst. ECN #
   Indicate the local institution's ECN number. If the local institution's engineering change system is not used this space is left blank.

6. *STAR ECR/N #*
   This number is issued by the STAR Project office and is used track engineering changes. The ECN number will consist of 6 characters. Below is an example of a typical number and what each character represents
   MAG001 where:

   MAG The first 3 characters represents the subsystem requesting the change i.e. the Magnet group

   _ _ _ *The next 3 characters represents a sequentially assigned number for the change beginning at 001 and ending at 999.*

7. Drawing, STAR Note, or Document Title:
   Indicate the title of the item that is to be changed.

8. Next Assembly ("used on") Drawing # (if applicable):
   Used only for drawings in which the drawing that is to be changed is called out on an assembly drawing

9. DESCRIPTION OF CHANGE
   Describe the change in appropriate detail. (note: in more detail than "increased size or added more bolts"), attach additional pages if necessary.

10. REASON FOR CHANGE
    Describe the reason for the change in appropriate detail. Attach additional pages if necessary.

11. IMPACT ON OTHER SUBSYSTEMS
    Describe the impact the change will have on other subsystems. For example: this change will result in a reduction in the allowed space for subsystem X's electronics. Attach additional pages if necessary.

12. IMPACT ON COST AND SCHEDULE
    Describe the impact the change will have on cost and schedule. This section must be filled out in detail if the change will result in a $25k or more increase in cost to the detector, or a slip in the STAR schedule of 2 weeks or more i.e. the change effects an item on the critical path. (Note: the change may effect a subsystem other than the subsystem requesting the change). Non critical path items do not have to be considered unless the change results in a schedule slip of 4 weeks or more. Attach additional pages if necessary.

13. *REASON FOR REJECTION (if applicable)*
    Completed by the STAR Project Office and will describe the reason that the change request has been rejected.

14. *REVIEW / APPROVAL*
    Contains appropriate approval signatures. Signatures are obtained by the STAR Project Office