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C-A OPERATIONS PROCEDURES MANUAL

13.6.2 Configuration Management

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Attachments

Hand Processed Changes

<u>HPC No.</u>	<u>Date</u>	<u>Page Nos.</u>	<u>Initials</u>
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Approved: \_\_\_\_\_ *Signature on File* \_\_\_\_\_  
Collider-Accelerator Department Chairman Date

D. Passarello

## 13.6.2 Configuration Management

### 1. Purpose

This document defines a process for the review of technical changes to C-A drawings and specifications. This process supplements the BNL's Standard Based Management System (SBMS) [Engineering Design](#) Subject Area. An Engineering Change Notice (ECN), [C-A-OPM-ATT 13.6.2.a, "Engineering Change Notice Form"](#), is required to initiate a revision to a drawing/specification intended for use in the production/procurement of research apparatus.

### 2. Responsibilities

C-A scientific and technical staff shall implement this configuration management program.

### 3. Prerequisites

None

### 4. Precautions

None

### 5. Procedure

#### 5.1 Reviews and Approval of Changes to Engineering Drawing/Specification

- 5.1.1 Any individual recognizing the need for a drawing change may prepare an Engineering Change Notice (ECN). The individual requesting the ECN is responsible for all required data, and for the submission of the ECN to the C-A Documentation Control Group. Data entry on the ECN may be typed or hand written.
- 5.1.2 ECN's shall state whether the change must be incorporated into items already produced/procured, as well as items that are in the process of being produced or procured. This information shall be entered in the appropriate section of the ECN form.
- 5.1.3 The C-A Documentation Control Group shall assign an ECN number to the request and maintain an ECN log. Recorded in the log will be the date, the drawing number, and the name of the individual who requested the ECN.

- 5.1.4 The cognizant engineers (CE) will evaluate the ECN for the following:
- Impact on form, fit, and function
  - Impact on tooling schedules, material, and costs
  - Impact on cost, schedule, and/or technical performance (i.e. performance, reliability, maintainability, availability, durability, interchangeability, systems interface, health, or safety)
  - Technical adequacy
  - Impact on drawing numbers and revisions
  - Impact on design review criteria. The Design Process section of [C-A OPM 13.6.1](#) outlines when to convene a formal design review.
- 5.1.5 The CE shall forward the ECN and affected drawings/specifications, to the C-A Documentation Control Group for review/approval routing. Distribution shall be based on the organizational responsibility and Quality classification specified on the affected drawing(s)/specification(s). Required signatures are as follows.
- A3 (Minor) Cognizant Physicist (required for Primary Area Enclosure changes) and Group Leader, or designee
- A2 (Major) Chief Mechanical, and/or Electrical Engineer, or designee, and Division/Deputy Division Head, or designee (Requires A3 signatures)
- A1 (Critical) Quality Assurance, Radiation Safety Committee Chairman, or designee, and Department Chairman/Deputy Department Chairman, or designee (Requires A3 and A2 signatures)

In some cases, as determined by the CE, additional approval signatures may be required on the ECN. These signatures may be recorded on the Engineering Change Notice - Additional Signature Sheet in [C-A-ATT-OPM 13.6.2.a](#).

- 5.1.6 The C-A Documentation Control Group shall forward the ECN and affected drawings/specifications (when appropriate) as directed by the CE. Approval signatures must be hand-written.

## 5.2 ECN Impact on Drawing/Specification Revisions

- 5.2.1 It is the responsibility of the CE, when reviewing an ECN, to evaluate the impact of a drawing modification on all subsequent higher and/or lower assemblies/parts.
- 5.2.2 Based on the information supplied by the CE, the cognizant design room will increment the drawing(s) revision by one letter if an item is changed in such a manner that none of the conditions in paragraph 5.2.3 (1 through 5) occur.

5.2.3 A new drawing will be created when a part/item is changed in such a manner that one or more of the following conditions occur.

- Performance or durability is affected to such an extent that superseded items must be discarded or modified for reasons of safety or malfunction.
- Parts, subassemblies, or complete articles, are changed to such an extent that the superseded (old article), and superseding (new article) items, are not interchangeable.
- When superseded parts (old parts) are limited to use in specific articles or models, and the new parts are not so limited to use.
- When a replaceable part, or subassembly within an assembly, is changed so that it is no longer interchangeable with its previous version, a new drawing number shall be assigned to the assembly which contains the new part/subassembly, if the new assembly is not interchangeable with previous revisions. All subsequent higher order assembly part numbers will also be changed, up to and including the level at which interchangeability is re-established.
- An item has been altered, selected, or is a source control item.

5.2.4 The ECN shall specify when a drawing becomes obsolete. It is recommended that the design room annotate each superseded drawing with the statement "This Drawing has been superseded by Drawing No. \_\_\_\_". The revision level of the superseded drawing shall not be incremented due to the addition of this statement in the field of the drawing.

### 5.3 Incorporation/Distribution of Engineering Change Notices (ECN)

5.3.1 For technical specifications, approval, incorporation, and distribution of changes, are the responsibility of the project engineer or physicists.

5.3.2 For drawings, the Design Group will incorporate the change into the drawing, referencing the ECN number in the revision section of the drawing.

- For updated engineering drawing(s) with typed approvals, the designer will type in the appropriate names and dates on the respective approved drawing. At this point, the release date is typed in, the file is transferred to the release directory, and a copy is plotted for the drawing file. The hard

copy of the drawing will contain, as a minimum, the signature/initials of the person who verified that the plotted drawing complies with the drawing file in the release directory.

5.3.3 If the changes specified on an ECN have not been incorporated into the original drawing, and hard copies of the drawing are released, the Design Room will

- List all outstanding ECN's on the drawing. When feasible, use the "Outstanding ECN" section of the title box.
- Annotate the original drawing with the note: "This Drawing (Specification) is not valid without ECN(s) \_\_\_\_\_." The annotated drawing and ECN may be distributed together to those needing change information prior to the availability of the drawing revision.

The revision level of the drawing shall not be incremented due to the listing of ECN information in the title box or the addition of the referenced statement in the field of the drawing.

**Note:**

No more than two outstanding ECNs may accrue against any drawing without a revision being made to the document incorporating the changes.

5.3.4 The C-A Documentation Control Group will maintain a file of approved ECN's.

5.3.5 To facilitate implementation of the ECN, the CE should consider the following:

- Contacting groups or individuals responsible for carrying out actions/dispositions required by the ECN.
- Submitting a "need to know" distribution list to the C-A Documentation Control Group. The C-A Documentation Control Group would inform, via email, the individuals on the distribution list that an ECN was written against a specific drawing/document.

5.3.6 The recipient of the revised/new drawing shall ensure that all drawings, obsolete or superseded by the revision, are removed from current files and/or workplaces, or are marked "Superseded", and are not utilized in processing material beyond the date the ECN was signed by the Chief ME/EE, or designee.

**6. Documentation**

A complete Engineering Change Notice is required before issuing revised drawings or specifications.

**7. References**

7.1 [C-A-OPM 13.6.1, "Preparation & Issuance of Engineering Drawings/Specifications"](#).

7.2 [SBMS, Engineering Design](#)

**8. Attachments**

8.1 [C-A-OPM 13.6.2.a, "Engineering Change Notice Form"](#).