Attachment 703.1 - E
Unreviewed Safety Issue Process - Process Steps and USI Worksheet

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1. **USI Title**
   Compose an appropriate title and enter it in the box at the top of the worksheet.

2. **Box 1 ~ Description**
   Enter a detailed description of the change in Box 1. This description should include any issues related to temporary interim configurations. The following issues should be reviewed and discussed in this box:

   Description of the change or discovered condition.
   Identification of parameters and systems affected by the change.
   Identification of the credible failure modes associated with the change.
   References of information used for the safety evaluation.

   Additionally, the impact of the change on the evaluated accidents should be discussed. The following items should be considered when discussing the description of the change.

   Identify the parts or procedures specified in the Accelerator Safety Envelope that are reviewed for potential impact by the change.
   Discuss how the procedures and parts affected by the change impact the consequences of these accidents.
   Identify the design basis accidents, if any, for which failures modes associated with the change can be an initiating event.
   Discuss the impact of the change on the probability of occurrence of the design basis accidents identified above.
   Identify the safety systems and equipment important to safety affected by the change.
   Discuss the impact of the change and/or the failure modes associated with the change on the probability of failure of the systems identified.

3. **Box 2 ~ Authorization Basis**
   List all of the documents and analyses that constitute the current Authorization Basis for the facility.

4. **Box 3 ~ Changes to the Accelerator Safety Envelope**
   Revisions to the Accelerator Safety Envelope must be approved by DOE - the USI process is not applicable. If the "yes" box is checked, then LBNL Radiological Control Manager (RCM) must be notified. The RCM determines the appropriate path for seeking institutional approval for the change and submitting the appropriate documentation to DOE for approval.

5. **Box 4 ~ USI Screening**
   A screening process is used to determine whether a USI approval [answering all six questions on the USI] is required.
   5.1 **Potential discrepant conditions**
   If the change is a discrepant as-found condition, then check the "yes" box.

   In the case of discovery of new information, analytic errors, discrepant as-found states, omissions, or other potential discrepant as-found screening does not apply and all six USI questions must be answered. New analysis results due to advances in analytical capability are not an indication of a discrepant safety analysis.

   If a potential safety-related discrepancy between the facility and the ASE statements is discovered, the following actions are required:

   Take appropriate action to ensure the immediate safety of personnel and place or maintain the facility in a safe condition until an evaluation of the safety of the situation without controls is completed;

   Notify the cognizant accelerator program division management and RCM as soon as possible;

   Perform an USI analysis of the discrepant condition; and

   Develop a corrective action plan for a permanent solution as required.

5.2 **Prior USI Determination**

If a prior USI approval completely envelops the pros posed change, a new USI is not required. If the answer to this question is "yes" then cite the prior USI approval.

5.3 **Screening Questions**

If the answers to all three of the screening questions are no, then the six USI questions may be skipped-go straight to the Approval step. An USI analysis is required if any of the following questions are answered "yes":

Changes to the accelerator facility: This should be interpreted to mean alterations to the design, function, or method of performing the function of a structure, system, or component listed as in the Accelerator Safety Envelope.

Changes in procedures: This should be interpreted to mean changes in procedures, processes or methods of operation listed or relied upon in the Accelerator Safety Envelope.

Conduct of new activities, tests or experiments: This should be interpreted to mean types of activities, tests or experiments [including user experiments] that introduce hazards not described in the Safety Assessment Document or that have the potential for impact on accelerator parts or procedures listed in the Accelerator Safety Envelope.

6. **Box 5 ~ USI Analysis**

Answer all six questions and provide a basis explaining each answer. Guidance on addressing the six USI questions is provided below.

Question 1 [Box 5.1]: *Could the proposed activity increase the probability [through a reduction in the margin of safety or otherwise] of an accident previously evaluated in the safety analysis?*

The proposed change must be compared with the basis for the probabilities in the SAD or other safety basis documentation constituting the Authorization Basis. If the proposed change results in an increase in probability from one frequency class to a higher frequency class [e.g. low to medium] or greater than an order of magnitude within a frequency class, the answer would be "yes". Qualitative estimates are acceptable, but rationale must be provided.

The margin of safety, though perhaps not explicitly defined in a SAD, may be implicit in the difference between acceptable operating limits and parameters described in the ASE statements.

Question 2 [Box 5.2]: *Could the proposed activity increase the consequences of an accident previously evaluated in in the safety analysis?*

A potential increase in consequences shall be evaluated by comparing the anticipated consequences of an accident with the consequences of a same or similar "family" of accident that has already been analyzed. If potential consequences increase beyond those of the bounding accident of that family, the answer is "yes". Examples of different families of accidents are prompt radiation exposure, exposure to radioactive materials, fires, and chemical hazards.

Question 3 [Box 5.3]: Could the proposed activity increase the probability [through a reduction of the margin of safety or otherwise] of a malfunction of equipment important to safety previously evaluated in the safety analysis?

Accident analyses often involve calculated or assumed failure of one or more systems important to safety. Other independent systems important to safety may be assumed to function normally and may even mitigate the severity of the accident. If a proposed change either degrades the performance of these systems or increases the challenged to these systems, or increases the probability that equipment important to safety will not perform as designed on demand, the answer would be "yes".

See Question 1 guidance regarding margin of safety.

Question 4: [Box 5.4]: *Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the safety analysis?*

This question evaluates changes that affect equipment and thereby potentially increase releases of hazardous material or energy and/or radioactive doses above the worst case limiting consequences in the safety analysis. Fundamental to this process is evaluating equipment that is important to safety in relation to the change. Credible failure modes identified in the analysis should be used in this evaluation.

Question5 [Box 5.5]: *Could proposed activity create the possibility of a different accident from any previously evaluated in the safety analysis, which could result in significant safety consequences?*

An accident involving an initiator or failure that was not considered in the safety analysis is potentially an "accident of a different type." An accident that may be the "different" but involves a smaller accident consequence than that already addressed in the safety documentation should not be considered an accident of a different type, unless the contribution of the accident causes the bounding case to be exceeded. Accidents of a different type are limited to those considered as likely to happen as those considered in the authorization basis.

Question 6 [Box 5.6]: *Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety from any previously evaluated in the safety analysis, which could result in significant safety consequences?*

Note: Malfunctions that may be considered "different" but are bounded by the existing accident analysis are not considered "malfunctions of a different type." Possible malfunctions of a different type are limited to malfunctions that are considered as likely to happen as those considered in the authorization basis.

Malfunctions involving equipment not covered by the original safety analysis constitute a "malfunction of a different type," as do malfunctions not predicted by the safety analysis.

7. **Box 6 ~ Review and Approval**

Based on the answers to the above six questions, state whether an Unreviewed Safety Issue exists or not. If any of the six questions were answered "yes", then a USI does exist.

After completion of the worksheet, pass the worksheet on to the Reviewer. The purpose of an USI review is to verify the technical basis of the USI. After the Reviewer signs the subject of the proposed change; or the RCM approves USI, process analysis and approvals.

If the USI is positive, then the RCM must also sign on the fourth signature line.

DOE must approve any change to the ASE, as described in EH&S Procedure 703, resulting in a positive USI before initiating the change. Unimplemented changes or alternative solutions not involving a positive USI or a change to the approved authorization basis do not require DOE approval.

Title Of USI:

INTRODUCTION

DOE O 420.2B requires that activities not be performed that involve an Unreviewed Safety Issue (USI). An USI may result from changes to accelerator structures, systems, components, procedures relied on in the ASE, or activities, tests or experiments that could impact the ASE. As part of the USI process, the following issues should be reviewed and discussed in this worksheet:

1. Description of the change or discovered condition.
2. Identification of parameters and systems affected by the change.
3. Identification of the credible failure modes associated with the change.
4. References of information used for the safety evaluation.

References to applicable paragraphs in Attachment E containing guidance are shown in brackets

1. **Detailed description** of the change or discovered condition, including issues related to temporary interim configurations [3, 4]. If the change requires a revision to the SAD, please list the affected sections and attach a redline version of changes [2]. [Attach engineering drawings if necessary].

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2. **List documents and analyses** that constitute the current authorization basis for the facility/process [3].

3. **Changes to the Accelerator Safety Envelope**
Even if the answer is "No", explain the basis for answers in all applicable sections.

Does the situation require a modification to the Accelerator Safety Envelope [4]?

○ Yes ○ No

Explain: [if Yes, Accelerator Program Division and RCM notification are required. In addition, DOE approval of the revised ASE is required and the USI process in not not applicable] List ASE elements affected.

4. **USI Screening**

a. Is this issue an as-found condition that could involve a potential discrepancy associated with the safety analysis [5.1]?

☐ Yes ☐ No

If Yes, then screening is not applicable. Go to step 5. Answer all six questions.

b. Is the proposed change completely enveloped by a previous USI [5.2]?

☐ Yes ☐ No

If Yes a new USI is not required. Go to approval step 6.

c. Is the proposed change a [5.3]:

1. Change in the facility as described in the current safety analysis?

☐ Yes ☐ No

2. Change in the procedures as described in the current safety analysis?

☐ Yes ☐ No

3. Activity, operation, test, or experiment not described in the safety analysis document?

☐ Yes ☐ No

Basis for answers [document references reviewed]:

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5. **USI Analysis**
For the situation being reviewed answer each of the following six questions [6].

5.1 Could the proposed activity/change increase the probability [through reduction in the margin of safety or otherwise] of an accident previously evaluated in the margin of safety or otherwise] of an accident previously evaluated in the Safety Analyses?

○ Yes ○ No

Basis:

5.2 Could the proposed activity/change increase the consequences of an accident previously evaluated in the Safety Analysis?

○ Yes ○ No

Basis:

5.3 Could the proposed activity/change increase the probability [through reduction in the margin of safety or otherwise] of a malfunction of equipment important to safety previously evaluated in the Safety Analyses?

○ Yes ○ No

Basis:

5.4 Could the proposed activity/change increase the consequences of a malfunction of equipment important to safety previously evaluated in the Safety Analysis?

○ Yes ○ No

Basis:

5.5 Could the proposed activity/change create the possibility of a different type of accident from any previously evaluated in the Safety Analyses that could result in significant safety consequences?

Yes No

Basis:

5.6 Could the proposed activity/change create the possibility of a different type of malfunction of equipment important to safety from any previously evaluated in the Safety Analyses that could result in significant safety consequences?

Yes No

Basis:

If any of the above questions is answered 'Yes' the proposed change involves an Unreviewed Safety Issue

6. **Based on the evaluation** presented above, the activity/change:

☐ does **not** constitute an *Unreviewed Safety Issue*

☐ does constitute an *Unreviewed Safety* Issue [DOE approval required prior to implementation

7. **Signatures**

Pre parer Signature	Date
Reviewer Signature	Date
Approval Signature	Date
Radiological Control Manager Signature [required for positive USIs only]	Date