Accelerator Division Safety Procedure

ADSP-02-0101

Response to Violations of the Accelerator Safety Envelope

Responsible Department: ES&H RPO

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1.0 Purpose and Scope

This procedure establishes the response to be taken by the Accelerator Division (AD) following the discovery of a potential Accelerator Safety Envelope (ASE) violation.

The ASE is the Department of Energy (DOE) "Authorization Basis" under which Fermilab may operate its accelerator facilities. The ASE is derived from the Fermi National Accelerator Laboratory Safety Assessment Document (SAD) and defines the operating conditions, safe boundaries, surveillance requirements, and the management or administrative controls necessary for safe operations that reduce the risk to the public, Fermilab workers, or the environment from accelerator operations.

The ASE requires that Radiation Safety Interlock System be functional during beam operations, accelerator operations be approved by the Accelerator Division Head, minimum staffing requirements be met in the Main Control Room (MCR), and beam operations occur within the established intensity and energy limits. The Beam Permit and Running Condition documents are used to convey to the Operations Department the ASE and maximum authorized operating intensity limits associated with each accelerator or beamline area.

This procedure is applicable to all machines that make up the Fermilab accelerator as outlined in the Fermilab Safety Assessment Document (SAD) and Accelerator Safety Envelope (ASE).

2.0 Responsibilities

Any activity violating the ASE must be terminated immediately, and accelerator operations for the affected area are not to resume until after division management determines operations may safely resume in consultation with the Chief Safety Officer and the DOE Fermi Site Office.

2.1 Accelerator Division Head

- Responsible for determining whether an apparent violation is a violation of the ASE.
- Responsible for ensuring that the appropriate steps have been taken such that, if a violation of the ASE has occurred, the complex has ceased to operate outside of the ASE.
- Responsible for informing the Facility Manager as defined in FESHM 3010.
- Responsible for coordinating the follow-up assessment of the incident, with particular emphasis on assessing the impact of the excursion on people and the environment.
- Responsible for determining whether operation may resume and is responsible for authorizing such resumption if a violation has not occurred or, following consultation with the Chief Safety Officer, Director and DOE Fermi Site Office, if a violation has occurred.

2.2 ES&H Radiation Physics Operations Department Head

- Responsible for ensuring the preparation and maintenance of this procedure.

- Responsible for reporting violations of the ASE in accordance with the Fermilab ES&H Manual.

2.3 AD Operations Department Head

- Is responsible for instructing the Operations Department Crew Chiefs and Operators on the requirements of this procedure.

2.4 AD Operations Crew Chief

- The Crew Chief is to take reasonable actions to return the complex to a safe operating condition by disabling beam transfer operations. Such actions are described in Section 3.5.

3.0 Examples of ASE Violations

The following examples of ASE violations are not a comprehensive list of violations, but rather intended to serve as guidance to facilitate such determinations.

- Passive Control Surveillance Not Conducted Within the Time Intervals Specified in the ASE
- Beam Transport without an Operational Radiation Safety Interlock System
- Known loss of Radiation Safety Interlock System safety function in any section where beam operations are in progress.
- Beam Transport without an Authorized Beam Permit & Running Condition
- Less than the Minimum Number of Operating Personnel on Shift:
    - Less than one qualified member of the Operations Department who has achieved the rank of Operator II or higher on shift.
    - Less than one member of the Operations Department present in the Main Control Room during beam transport operations.
- Exceeding Beam Intensity and/or Energy Limits Prescribed in the ASE and stated on Beam Permits and Running Conditions

4.0 Response to Potential ASE Violations

a. Crew Chief will disable beam to all accelerator areas.
b. The Crew Chief shall have the area outside the affected beamline visually surveyed for personnel. Any personnel in the area shall be identified by name with contact information for further follow-up.
c. Crew Chief shall inform the following individuals:
    i. Accelerator Division Head;
    ii. AD Operations Department Head;
    iii. ES&H Radiation Physics Operations Department Head;
    iv. ES&H Radiation Safety Officer(s);

v. AD Run Coordinator if applicable.

d. The Accelerator Division Head will determine whether the apparent violation has indeed occurred, and whether it violates the ASE.
e. The Accelerator Division Head, following appropriate consultation, will determine whether there were any beam-related losses associated with the violation.
f. The Accelerator Division Head will determine whether the beam losses, if they occurred, produced radiation that exceeded levels allowed in the FRCM.
g. At the direction of the Accelerator Division Head, information will be gathered on the operational conditions at the time of the violation as necessary.

5.0 Initiating Occurrence Reporting

In the event it is determined that a violation of the ASE has occurred, the responsibility for reporting violations resides with the Accelerator Division Head.

NOTE: If the Accelerator Division Head determines that the potential violation does not constitute a violation of the ASE, no further reporting is required.

6.0 Resuming Accelerator Operations

Sections of the accelerator or events that have not violated the ASE may resume operations pending Division Head approval. Accelerator operations for the affected area are not to resume until after division management determines operations may safely resume in consultation with the Chief Safety Officer and the DOE Fermi Site Office. Prior to allowing the resumption of operations in affected areas, the Accelerator Division Head, in conjunction and consultation with others as necessary and appropriate, must analyze the excursion, assess its ES&H impact, and determine that appropriate steps have been taken such that subsequent excursions are unlikely.

7.0 Distribution

An electronic controlled copy of this procedure is maintained on the Beams DocDB:
https://beamdocs.fnal.gov/AD-private/DocDB/ShowDocument?docid=8666