

ACCELERATOR SAFETY ENVELOPE

Accelerator Test Facility, Building 820

October 31, 2004

This ASE supercedes the ATF ASE dated August 8, 2001 and is used in conjunction with the ATF Safety Analysis Document dated October 1, 2004.

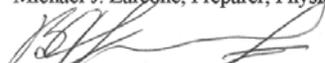
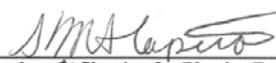
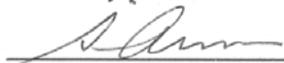
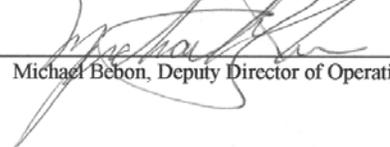
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Approvals

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 Michael J. Zarcone, Preparer, Physics Dept. ES&H Coordinator	11/9/04 Date
 Vitaliy Yakimenko, ATF Head	11/12/04 Date
 Stephen Shapiro for Physics Department ES&H Committee	11/18/04 Date
 Samuel Aronson, Physics Department Chair	11/18/04 Date
 Thomas Kirk, HENP Associate Lab Director	12/22/04 Date
 Michael Bebon, Deputy Director of Operations	1/11/05 Date

## 1. Introduction

This Accelerator Safety Envelope (ASE) governs the operation of the Accelerator Test Facility (ATF), including the gun, linear accelerator, transport lines, beamlines and beam stops.

Violation of this ASE's Limits listed in Section 2 requires an immediate halt of accelerator operations and notification of Department of Energy-Brookhaven Site Office (DOE-BHSEO), Brookhaven National Laboratory (BNL), and Physics Department line management. Reviews will be undertaken and corrective actions developed, scheduled and tracked until all actions have been completed. Notification of BNL and DOE management and the approval of the Physics Department Chair are required to return to accelerator operation.

Sections 3 and 4 require the existence of a number of programs that ensure that the hazard evaluations of the SAD are maintained intact and controlled. Violation of a programmatic requirement listed in Sections 3 and 4 requires an immediate halt of the specific program activity and notification of DOE-BHSEO, Brookhaven Science Associates, and Physics Department line management. Reviews will be undertaken and corrective actions developed, scheduled and tracked until all actions have been completed. Notification of BNL and DOE management and the approval of the Physics Department Chair are required to restart the activity.

No activity or facility modification may compromise the Safety Analysis Document (SAD) or the ASE. Proposed changes are to be screened for hazards that lie outside the bounds of those considered in the SAD and in the development of the ASE, by implementing the Unreviewed Safety Issue Process. The USI process may result in rewriting portions of the SAD and modifying the ASE. Such revisions require applicable review and approval. Reportable events may also cause the USI process to be initiated.

This document, as well as the companion ATF Safety Assessment Document listed on the cover page, is subject to change control managed by the Physics Department according to the Internal Controlled Documents Subject Area.

## 2. Safety Envelope Limits

The operation of the ATF, including the linear accelerator, transport lines, beamlines and beam stops must be carried out in a manner that ensures that the following safety envelope limits are not exceeded:

- 2.1 The radiation dose equivalent to individual guests and staff members working in other BNL facilities adjacent to ATF Building 820 shall not exceed 25 mrem in one year as the result of ATF operations.
- 2.2 The collective radiation dose equivalent to ATF guests, users and staff members working at the ATF shall not exceed 1250 person-mrem in each calendar year as the result of ATF operations.

### **3. Engineered Safety Systems Requiring Calibration, Testing, Maintenance, and Inspection**

- 3.1 Facility interlocks providing radiation protection to accelerator vaults and beam lines shall be designed, tested and maintained in accordance with BNL ESH Standard 1.5.3, Interlock Safety for Protection of Personnel.
- 3.2 Radiation monitors that annunciate locally shall be placed in locations subject to transient radiological conditions associated with ATF operations. Responses to radiation conditions identified by this system shall be established in formal procedures in the ATF Fault Response Procedure. These monitors will be calibrated annually and tracked through the ATF Notification System.

### **4. Administrative Controls**

- 4.1 Two persons must be present at the facility during accelerator operation, at least one of whom must be a fully qualified operator or duty operator. The operator shall follow guidelines and procedures as set forth in the ATF Handbook. The second person does not require operator training but does require the ATF facility specific training as required in Section 4.00, Training Programs and Requirements for ATF Personnel of the ATF Handbook.
- 4.2 Configuration of radiation shielding and other radiation protection systems shall be controlled via the Authorization for work on ATF Acceleration Safety Systems.
- 4.3 All experiments conducted at the ATF shall be reviewed and approved using the BNL Physics Department's Work Planning and Experimental Safety Review Policy. Any proposed experiment that would require operation outside of the approved SAD and ASE requires additional evaluation and/or revision of the SAD and ASE prior to its operation.
- 4.4 Hazards associated with routine work conducted at the ATF shall be controlled via the Physics Department's Work Planning and Experimental Safety Review Policy.
- 4.5 Radiological Control Division personnel shall deploy and manage radiological postings by following the Radiological Posting Requirements program.
- 4.6 Personnel and area radiation TLD dosimeters shall be deployed and managed by Radiological Control Division personnel.

## 5. Operating Envelope

The Operating Envelope denotes facility operating parameters or systems with a significant link to safety. Operation within the conditions identified in the Operating Envelope provides a buffer against exceeding the ASE Limits in Sections 2, 3 and 4 above. Operation of the facility in excess of the parameter identified in the Operating Envelope would not constitute a violation of the ASE, as long as other provisions of the ASE are not exceeded. Excursions beyond the levels of the Operating Envelope shall be recorded in the ATF Operations Log, investigated by the [Physics Department's Accident/Incident Investigation Committee](#) with any Corrective Actions tracked using the Physics Department's Family ATS system.

- 5.1 The radiation dose Administrative Control Level to personnel working at the ATF is 100-mrem whole body dose during the calendar year. Permission to exceed this level must conform to the approvals defined in the Physics Department's [Radiological Control - ALARA Program](#).
- 5.2 The ATF shall not exceed the Maximum Electron Beam Energy of 120 MeV. This Maximum Electron Beam Energy will be limited by the installed capability of power systems. No active monitoring of the beam energy will be provided. Any increase in RF power that may potentially result in exceeding the Maximum Electron Beam Energy of 120 MeV will require review and approval of the ASE prior to such change.
- 5.3 The maximum average electron current during ATF operation shall be limited to 600 nA.