

ARGONNE NATIONAL LABORATORY

HIGH ENERGY PHYSICS DIVISION



ARGONNE WAKEFIELD ACCELERATOR

AWA VAULT SAFETY SYSTEM

Reviewed by: Manoel Conde and Zikri Yusof

Date: 04/02/2009

Approved:

HEP-AWA Group Leader: (signed copy in manual)
Wei Gai

Date: 05/15/2009

HEP-ESH Administrator: (signed copy in manual)
Leon Reed

Date: 05/15/2009

HEP-Division Director: (signed copy in manual)
Harry Weerts

Date: 05/15/2009

SECURED AREA

Introduction:

This document is intended for use by personnel who are familiar with the secured area (AWA Vault). The Vault will be used in three different modes of operation, laser operation only, RF operation only and beam on, each with separate safety requirements. The following procedures establish the actions required for access to the Vault in each mode. Securing of the Vault may be prevented or canceled at any time by pulling the **Emergency Cable** mounted along the east wall of the Vault.

ACCESS DURING LASER ONLY OPERATION

Access to the Vault during laser only operation is to be only for making such adjustments as may be required to obtain proper operation of the laser system. No one may enter the area without permission from the individual in charge of the procedure in progress at the time. Both access doors are locked and the key is captive on the same ring as the key used to open the laser shutter. Door #2 is equipped with an electric lock release, activated for a limited time by a push button switch adjacent to the door. Personnel, **wearing proper eye protection**, may depress this switch, open door #2, enter the Vault and re-close the door within this time period (10 seconds) without interrupting laser operation. Failure to close the door during the timing interval will cause the laser shutter to close.

Emergency egress by individuals may be made by opening either door, both of which are equipped with push-bars, which unlock the door from the inside at any time. Opening the doors in this manner will cause the laser shutter to close and should be done only in an emergency. For normal egress, a push-button switch located adjacent to door #2 should be depressed. This energizes the same timer as the push-button used for access. The door may then be opened, the individual exit and the door re-closed without interrupting laser operation.

ACCESS DURING RF ONLY OPERATION

Persons wishing to enter the Vault during RF only operation must request permission to enter from the individual in charge of the procedure in progress. The key to the access doors is captive on the same ring as the modulator lockout key. When permission to enter is granted, the operator will turn off the RF system (if operating), remove the modulator lockout key and the door may be unlocked. Persons entering the Vault must have proper radiation monitoring. Each individual must remove an interlock key from the key box adjacent to the door of entry and retain said key on his person while in the Vault. In the event of a group tour, only the leader of the tour need have radiation monitor and a key on his person. It is the responsibility of the leader to assure that all members of the tour have left the Vault prior to returning the key to the key box.

ACCESS DURING BEAM-ON OPERATION

The only difference between beam on and RF only operation is that the laser shutter is open during beam-on operation. The same procedure will be used for access during beam-on operation as during RF only operation.

SECURING AREA FOR LASER ONLY OPERATION

In the control room, set the mode selector switch to “laser only” position. Obtain key for laser shutter switch. This key is captive on a ring, which also contains also the Vault door key and the RF lockout key, thus the RF system is rendered inoperative. Check that all-key tree box keys are in place. If any key tree keys are missing, it is necessary to have the individuals with the missing keys leave the Vault area and replace the keys. Proceed through Vault, requesting personnel not involved with the laser procedure to leave the area. Close Vault door #1. Proceed through Vault, noting that no personnel not involved with the laser procedure are present and that those involved with the procedure are wearing proper eye protection. Close Vault door #2. An audible warning will sound (approximately 20 seconds duration) as an additional warning for personnel to leave the area and the laser system is enabled so that the key may be used to open the laser shutter. The area is now secured for laser operation.

SECURING AREA FOR RF ONLY OPERATION

In the control room, set the mode selector switch to the “RF only” position. Obtain key for RF system lockout switch. This key is captive on a ring, which also contains the laser shutter switch key and the Vault door key. Check that all-key tree box keys are in place. If any key tree keys are missing, it is necessary to have the individuals with the missing keys leave the Vault area and replace the keys. Proceed through Vault, requesting any personnel present to leave the area. Close Vault door #1. Depress the survey switch near door #1. This will energize rotating warning lights and audible signals for a preset period (approximately 20 seconds). While the warning signals are operating, proceed through the Vault, checking that no one is present, and exit through door #2, closing the door to secure the area. If door #2 is not closed during the warning period, the survey will automatically cancel and the survey procedure must be repeated in order to secure the area. Once the doors have been properly closed and warning time-out completed, the area is secured for RF operation.

SECURING THE AREA FOR BEAM OPERATION

In the control room, set the mode selector switch to the “beam” position. Obtain key for RF system lockout switch. This key is captive on a ring, which also contains the laser shutter

switch key and the Vault door key. Check that all-key tree box keys are in place. If any key tree keys are missing, it is necessary to have the individuals with the missing keys leave the Vault area and replace the keys in the proper switch. Proceed through Vault, requesting any personnel present to leave the area. Close Vault door #1. Depress the survey switch near door #1. This will energize rotating warning lights and audible signals for a preset period (approximately 20 seconds). While the warning signals are operating, proceed through the Vault, checking that no one is present, and exit through door #2, closing the door to secure the area. If door #2 is not closed during the warning period, the survey will automatically cancel and the survey procedure must be repeated in order to secure the area. Once the doors have been properly closed and warning time-out completed the area is secured for beam operation and the laser shutter will open.