Use of FSU Particle Accelerators

Florida State University has a 20 MeV tandem accelerator coupled to a 10 MeV linear accelerator. The 20 MeV tandem accelerator is located in the east end of the basement of the Nuclear Research Building and the other one is located in the west end of the basement.

Each accelerator must have available, at or near the control console, a copy of the "Operating Procedures" for that particular accelerator as well as the applicable requirements outlined in 64E-5.804(1)(b), FAC. Personnel working in radiation areas and visitors to those areas must wear a personal radiation monitoring device, which can be self-assigned at the entrance to the 20 MeV accelerator control room.

A TLD area monitor is positioned near the entrance to each accelerator target room to monitor radiation exposure to members of the public. These TLD devices are exchanged and read quarterly.

Principal Investigator

Dr. Ingo Weidenhover, Accelerator Physicist, is the Principal Investigator of the tandem accelerator and is responsible for the overall operation of the accelerator facility, including the training and experience of the accelerator operators.

Safety Features

Due to the nature of many of the operational experiments involved with this accelerator and the associated low levels of radiation, interlocks on the two steel doors, control target room door and the accelerator target vault room door, are not always necessary. The documented low radiation exposures to accelerator personnel and the placement of an area monitor at the shielding door are our means of determining that this procedure is adequate. Accelerator personnel entering these areas during operations when radiation fields may be present shall wear dosimetry and use appropriate portable survey instrumentation.

Radiation Safety Operating Procedures

Accelerator Operator Duties

- The "on duty" operator's name must be entered in the accelerator logbook, or otherwise posted at the control console.
- The operator is responsible for seeing that the radiation lights, interlocks and warning devices are operating properly and must become familiar with the radiation protection panel (at the control console) where panel lights and meters indicate the proper functioning of these devices.
- The operator is also responsible to control unauthorized personnel in the area.
- Report any failure of radiation detection instruments to the Radiation Safety Office.

Radiation Warning Indicators

If the control power is on at the control desk and the charging system is running, the following "radiation area" lights are on:

- At entrance to the target room;
- At the entrance to the accelerator vault;
- In accelerator vault;
- In corridor leading to the control room;

- "Accelerator operating" light outside entrance door.
  Before beam is put into accelerator, announce the intent to do so over the lab's intercom system is required.

If charging system is running and the beam stop is open, these additional lights are on:

- "Beam on" light in target room;
- Rotating flashing beacon in target room.

Any radiation warning light failures shall be recorded in the daily log and all lights shall be checked during maintenance each week.

Control of Entrances to the Accelerator Facility

- The Radiation Safety Office must be informed prior to making any changes in the entrance controls or procedures.
- The door from the gas handling room to the accelerator should be kept closed at all times when the accelerator is in operation and kept locked when "hot" runs are in progress.
- The door from gas handling room to the outside should be kept locked at all times when the accelerator is in operation.
- Due to the limited use of maze entrances (maze #1 and maze #2), entrances are presently controlled by radiation color-coded ropes.
- The hall door to target room II is equipped with a combination lock.

Control of Radiation Areas

- There are three potential "radiation areas" associated with the 20 MeV accelerator complex; target room I, target room II (including the linac vault) and the tandem vault. Whenever the room lighting is off in any of these areas, do not enter the area; this is an indirect warning that radiation may be present.
- When the accelerator is in operation, entry will be permitted into areas where the radiation is minimal and near background. To prevent an increase in radiation due to the beam being switched into these areas, two key switches will be provided in the control room. One will prevent the beam stop into target room #1 from being opened until the key is turned and its switch activated. The other will similarly control the beam stop into the linac vault and target room II.