



RADIATION SAFETY TRAINING AT NAL

M. Awschalom and H. Howe

June 2, 1971

Training in radiation physics and radiation safety is being carried out at three levels at NAL. They are

1. Orientation. All Laboratory personnel are given a one-hour orientation talk to acquaint them with basic facts about the nature of radiation, radiation effects, comparison of radiation to other modern hazards, instrumentation, personnel monitoring devices, AEC guidelines, and methods of radiation protection, and types of radiation encountered at NAL.
2. Training of Technical-Section Personnel. The technical sections of the Laboratory are responsible for carrying out their work in a safe manner, including the avoidance of unnecessary exposure to radiation. Selected technicians and staff members of technical sections are being trained to carry out these responsibilities. The subjects covered in this course are:
  - a. Types and properties of radiation
  - b. Interactions of radiation with matter
  - c. Radiation protection quantities and units
  - d. Detection techniques
  - e. Surveying methods
  - f. Determination of occupancy time
  - g. Interlock systems
  - h. Labeling of areas
  - i. Classification of materials by radioactivity by m remanent
  - j. Methods used to minimize radiation exposure.



These people supervise accelerator maintenance and improvements. Aside from the interlock systems, which are important during actual operation, they are largely concerned with remanent-exposure rates. The course emphasizes the measurement of such rates. These people also supervise the use of personnel dosimeters by all personnel in their section. The radiation-physics section is on call to back up operating personnel when the dosimeters go beyond preagreed levels given in the operating manual.

This course extends over approximately eight to twelve hours with a one-hour per month continuing review after completion. At this time, all accelerator sections have been covered. No suitable text has yet been found for this course. Technical movies will be used during the review sessions.

3. Radiation-Physics Section Training. All technicians in the radiation-physics section take an intensive course covering all aspects of radiation physics. In addition, the course discusses relevant aspects of accelerator physics.

The course requires approximately 100 class hours. The texts used are

- (i) Radiation Monitoring. Wade and Cunningham  
(AEC Division of Technical Information)
- (ii) Inside the Nucleus. Adler (Signet)
- (iii) Radioactivity and Its Measurement. Mann and Garfinkel (Momentum)

(iv) Radiation-Safety Technician. Training Course--  
Moe, Lasuk, and Schumacher (ANL-7291, Argonne National Laboratory).

The table of contents of this last reference is used as the outline of the course (omitting the chapters on reactors and hot cells).

In addition to this formal course work, all radiation-physics technicians are intensively trained on the job in maintenance and use of radiation instruments. This maintenance work is rotated through section personnel to maintain competence.

At this time, the basic 30-week course has been completed. The training is being continued with emphasis placed on operational radiation safety topics resulting from actual experiments at NAL.