San Francisco Fire Department

Division of Training

Training Bulletin 05-1

Self-Reading Electronic Dosimeter

January 2005

SAN FRANCISCO FIRE DEPARTMENT
GENERAL ORDER

File Code 05 A-06
January 19, 2005

From:	Chief of Department
To:	Distribution List "A"
Subject:	Training Bulletin 05-1 Self Reading Electronic Dosimeter; Issuance of
Reference:	Rules & Regulations, Section 402
Enclosure:	Enclosure "A" - Training Bulletin 05-1 Self-Reading Electronic Dosimeter Enclosure "B" - Training Bulletin Index

Officer Endorsement:
Section 1108 – R & R

1. The San Francisco Fire Department is issuing Training Bulletin 05-1 *Self-Reading Electronic Dosimeter* (see Enclosure "A").

2. This Training Bulletin will be referred to as the Department's current position on the self-reading of electronic dosimeters in lieu of existing publications concerning this subject matter.

3. Company Officers must include the updated Training Bulletin index (see Enclosure "B") in the Training Bulletin Binder, located in every fire station.

4. Any questions or concerns regarding the above may be directed to the Division of Training at 970-2000.

Joanne Hayes-White
Chief of Department

TRAINING BULLETIN 05-1
DIVISION OF TRAINING
PUMP OPERATIONS
SELF READING ELECTRONIC DOSIMETER

Standard Operating Procedures

Background:
The SFFD Fire Dept. HazMat Advisory Committee requested that the Department acquire personal radiological dosimeters to determine radiation exposure to members of the HazMat Team and members of the Metropolitan Medical Task Force who may enter an area where ionizing radiation is present. The Committee requested that these dosimeters be used to document individual exposure which involves determining radiation dose. They wanted the dosimeter to be small so that responders can wear them. After discussion with the SF Police Dept. Bomb Squad, reviewing manufacturer's literature, and discussions with manufacturer's representatives, the Science Applications International Corporation (SAIC) PD-10i was selected. The selection of this dosimeter was made in 2001-2 with the best available knowledge at the time. Thirty-two dosimeters were received in October 2004

Description:
The SAIC PD-10i dosimeter looks very much like a pager. It is the same size and shape of normal pagers. It has a similar belt clip. It also has a similar display at the top of the instrument. The dosimeter has Geiger-Mueller detector and reads only gamma radiation. Most radiation sources of concern are gamma sources or contain gamma and beta sources. The dosimeter uses a single AA battery. Battery life can be greatly extended using the idle mode which is a feature of this instrument. The dosimeter has only two buttons, the "Run" and "Mode" buttons. After the dosimeters are set up, users only have to push the "Run" to start operation and begin measuring radiation dose. Selected operators, (i.e., DPH Environmental Health or HazMat Team members) will set up the dosimeters with the appropriate alarms. The two most important display settings are "Dose" and "Dose Rate". When the instrument is "turned on" from idle mode, the display will eventually wind up at the "Dose" display.

Assignment:
The following SF HazMat Team units will be assigned the SAIC PD-10i dosimeters:

Engine 36 (HazMat 1) - 4 dosimeters
Battalion 2 - 2 dosimeters
Rescue 1 - 4 dosimeters
Rescue 2 - 4 dosimeters
Rescue Captain 1 - 1 dosimeter
Rescue Captain 3 - 1 dosimeter
SF Airport Fire - 2 dosimeters
DPH Environmental Health – 1 dosimeter

The units will keep the dosimeters on their vehicles. The dosimeters will be kept in the idle mode.

When to Use the Dosimeters:

The dosimeters will be used whenever teams enter a radioactive-contaminated area determined by a radiation survey meter. A radioactive-contaminated area will be defined as 1) an area that exceeds 2 millirem/hr. or, 2) an area that exceeds three times the background level of radiation. Examples of incidents where dosimeters may be used include an accident involving a vehicle carrying nuclear medicine or a fire in a nuclear medicine clinic at a hospital.

Operation:

Dosimetry Reading: To initiate dosimetry, the responder will push the "run" button once. The Dose display will come up (units are in mR, millirem). The responder will wear the dosimeter, (preferably outside of personal protective equipment). Responders in Level A suits can hold the dosimeter in a bag or attach it to another instrument. Responders in Level B can attach the dosimeter to a SCBA strap. Responders in Level C can hold the dosimeter in a bag or use a belt. After the incident is over, the responder will show the Battalion 2 Chief or company officer, the final dose result and they will agree on the dose reading. The Chief or company officer will keep a record of the results for all the personnel under his/her command.

Dose Rate Reading: If a dose rate reading is needed, the responder can push the "mode" button once to read the current dose rate (units are in mR/hr). Dose rate readings are used to determine how much radiation is in the vicinity of the dosimeter or how strong is the radioactive field.

Stay Time reading: Another push of the "mode" button will have the display read "Stay Time". "Stay Time" can be used as a timer to warn responders how long they can stay in a radioactive area. We will not use this mode. The responder can continue to push the "mode" button to read either dose or dose rate.

Alarms: The alarm warnings have been set to high levels of dose and dose rate. The dose alarm will be set to 40 rems. EPA has set a one-time emergency responder limit of 50 rems. If this alarm goes off, all members of the team that entered the exclusion zone together will leave the exclusion zone and go to a non-contaminated area. The dose rate has been set to 50 rems/hr. If the dose alarm goes off, it can be shut off by pushing the "mode" button. The dose rate alarm cannot be shut off unless the responder moves to a radioactive field of less than 50 rems/hr.

Chirp Rate: The dosimeter will make a chirp sound every time a specified amount of dose is accumulated. The chirp rate has been set for every 50 mR.

Dose Reset: The dose display can be reset to 0.00 mR by pushing the "mode" button for 5 seconds.

Idle Mode: Whenever the dosimeter is not used, the dosimeter should be put into Idle Mode. To put into Idle Mode, push the mode button until the "Stay Time" display is viewed. Push the "Run" button and hold, then push the "Mode" button. The **"IDL"** flashes on the display. Press the "Run" button again and nothing will be on the display. You are now in Idle Mode.

Low Battery: A low battery will be indicated by a flashing battery icon on the display. Replace the battery if needed.

Dead Battery: If no display is shown after pushing the Run button in Idle mode, a new battery may be needed. Replace the battery, and push the "Run" button. The previous alarm settings will still be set.

Monthly Checks: The dosimeters should be checked monthly to make sure the batteries are still good. Each team will be responsible for the battery checks.

Decontamination: If the dosimeters enter a contaminated area where there has been a release of radioactive particulates, the dosimeters can be decontaminated using a wet cloth. Do not immerse the dosimeter in water.