Radiation Safety and Protection

527.1 PROCEDURE

The Division Chief or designee shall serve as the Radiation Safety Officer (RSO) for the facility and shall:

(a) Maintain the Radiation Safety and Protection Program and coordinate ray-based body scan devices' safe operation in compliance with applicable State and Federal regulations

(b) Ensure all new or relocated radiation sourcing equipment operated within the facility is registered and annual fees are paid to the Radiologic Health Branch of the California Department of Public Health (form RH2261) before the effective date of the license

(c) Ensure all radiation sourcing equipment operated within the facility is serviced and maintained in compliance with all applicable State and Federal requirements

17 CCR 30231 requires above payment and mandates that failure to do so requires the usage of the scanning devices to cease until all fees have been paid immediately.

The Administration Senior at the facility will serve as the Campus Section Manager and will be responsible for the following:

(a) Report any movement or relocation of a body scan device to the RSO

(b) Notify the RSO upon becoming aware of any maintenance or safety issues related to the body scan device

(c) Ensure all radiation sourcing equipment operated at the facility is serviced and maintained in compliance with all applicable State and Federal requirements

(d) Report new X-ray emitting equipment to the RSO before it arrives at the facility

(e) Ensure only officers who have successfully completed proper training are assigned to operate the body scanner

(f) Ensure all parts removal and installation are completed by a designated sub-contractor

(g) Ensure all survey, service, inspection, and instrument calibration records are retained for the lifetime of the respective body scan device

(h) Ensure that all required notices are posted conspicuously on a wall or bulletin board where the body scanner is located. A binder with all the relevant regulations regarding the body scanner will be made available in the designated workstation

527.2 BODY SCANNER OPERATION

(a) Only officers who have successfully completed training will be allowed to operate the body scanner equipment. In addition, officers who may be pregnant or have confirmation of pregnancy, shall not operate or be in the proximity of TEK84 Scanner during its use. Officers that are actively trying to get pregnant shall discuss with their chain of command

(b) The operator's manual shall not be removed from the designated workstation

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(c) Pregnant youth will not be scanned with a body scanner

(d) During the operation of the body scanner, unauthorized persons including bystanders, shall not be allowed inside the footprint of the Intercept unit itself. All other areas are acceptable. The working zone will be clearly marked around the unit. The device shall be considered operational while the red light on the unit is on

(e) Each body scan device shall be marked with the following:

1. Caution! Dangerous Voltage
2. Caution! Radiation Danger

527.3 BODY SCANNER SAFETY FEATURES

Safety features are built into the device, which minimizes the exposure doses to which the personnel and persons being scanned could be exposed:

(a) X-ray generator is enclosed in the X-ray protection case

(b) System of slit diaphragms in the X-ray protection case provides a narrow fan-shaped X-radiation beam

(c) X-ray protection shutter shuts off the output of the X-radiation from the generator

(d) Permanently connected additional X-ray filter

(e) High-sensitivity digital X-ray converter

(f) Built-in dosimeter for monitoring the stability of the X-ray generator

527.4 BODY SCANNER MALFUNCTION

In the event of a scanner malfunction, the X-ray protection shutter shuts off X-radiation output from the generator. If the X-ray protection shutter fails, high voltage to the X-ray tube shuts off. The software tests the system when it is turned on and during the scanning process. Error messages are displayed on the operator's screen.

If any safety features become inoperable, the officer designated to operate the body scanner shall shut down the body scan device and immediately notify the Watch Commander.

527.5 SERVICING AND SURVEY OF BODY SCANNER

The calibration, periodic annual maintenance of the X-ray scanner, and radiation survey will be performed only by persons and contractors authorized to perform such services. Refer to the Intercept Tek84 Operations Manual for detailed service tasks.

527.6 ANNUAL RADIATION SURVEY

An annual radiation survey that checks to ensure no radiation exposure to the officer designated to operate the body scanner shall be performed on each body scanner device:

(a) At intervals not to exceed more than one (1) year

(b) Upon installation of a new unit

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(c) Upon relocation of an existing unit

(d) Immediately following any service that could potentially increase the system's output

527.7 RADIATION DOSES

The maximum radiation dose to which a youth being scanned is exposed per scanning session does not exceed.90 µSv. For the Tek84 body scan device, the annual quota of the dose for one person in case of repeated inspections is set to be 30% of the limit of the man-caused exposure of the population to the radiation (that is, 0.25 mSv/year). The body scanner is set so that it will not scan a person if their dosage exceeds the annual limit.

The three scan techniques available on the Tek84 body scan device are:

(a) "Low" (0.25uSv per scan), "Medium" (0.50uSv per scan), and "High" (0.90uSv per scan)

(b) Considering the above characteristics of the body scan device, it allows the same person to be inspected up to 1000 times per year at.25 uSv, 500 scans per year at.50 uSv, and 277 scans per year at.90 uSv. (Two to three scans per day)

(c) Each respective scan level produces a slightly higher level of image resolution. To maximize the ability of officers to detect small items with "loose" degrees of density, the "high" dose rate should be utilized as the default scanning level

527.8 OPERATOR SAFETY AND BYSTANDERS

The Intercept Tek84 body scanner is a shielded unit that allows bystanders and the operators protection from the level of exposure per day and year.

Bystanders who may be pregnant or have confirmation of pregnancy shall not be in the proximity of the Canon RadPRO X-ray body scanner during its use.

527.9 DAILY SYSTEM CHECK

During each shift, the officer assigned to operate the body scan device will conduct the following system check before utilizing the device:

(a) Inspect the device for obvious damage

(b) Ensure all access panels are securely in place

(c) Ensure all external cable connections are secure

(d) If the system is not already on, turn it on

(e) Verify that the "Power On" light is illuminated

(f) Record the systems check in the facility Information Management System

If any damage or malfunction is found during the systems check, the officer shall power off the unit and notify the Watch Commander and the Section Manager. The unit will be placed "Out of Service" until appropriate repairs have been completed.

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527.10 EMERGENCY PROCEDURES

(a) Should an emergency occur, the body scanner device shall be powered off, and Watch Commander and the department RSO shall be notified

(b) If the control panel is not functioning, the main power breaker for the system must be shut off and/or the unit should be unplugged immediately

(c) If a situation occurs in which the officer designated to operate the body scanner suspects possible exposure to excessive levels of radiation while operating the system, they should immediately advise the Watch Commander and seek medical attention. The Watch Commander shall immediately discontinue the use of the body scan device

(d) Upon completion of needed repairs by an authorized service engineer, a Radiation Survey must be conducted on the identified body scan device. The body scan device can only be cleared to return to regular operation if it is determined to be safe to do so by the authorized service engineer

If it is believed a radiation leak has occurred, the RSO will ensure that a service engineer from Tek84 or other qualified service contractors will calculate the approximate exposure (radiation intensity) of the person(s) possibly exposed.

527.11 TRAINING

Body scanner operator training shall consist of the following subject matter:

(a) Design of the scanner

(b) Purpose of basic components

(c) Principals of scanner operation

(d) Radiation and scanner operation safety principles

(e) X-ray history, X-ray tube, penetration & absorption, X-ray scanner features, limitations of X-rays, and prohibited items

(f) Control of scanner: switching on, testing, data input, scanning, and switching off

(g) Principles of investigation of digital images: analysis (determination) of an object on the human body, using the mathematical filters, scaling, etc.

(h) Malfunction diagnostics

(i) Health and safety

(j) Practice and knowledge testing

The facility Training Officer will be responsible for training and certifying officers to operate the equipment and for providing an annual recertification training. The Training Officer will keep record of completion dates and recertification due dates in the training tracker.

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