 <p>KENTUCKY CORRECTIONS Policies and Procedures</p>	Policy Number	Total Pages
	Date Filed	Effective Date
	Supersedes	
Authority/References	Subject	
ANSI/HPS N43.17-2009 (as amended) CPP 9.8, 9.23	RADIATION SAFETY PROGRAM	

8.10

5

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December 8, 2021

N/A

I. DEFINITIONS

“Operator” means any staff member associated with the operation of the full-body scanner whose responsibilities include at least one of the following: initiating or stopping the scan, verifying the system is operating correctly, providing information and instructions to the screened individuals, and controlling access to the inspection zone. This does not include other employees, such as individuals who may be remotely viewing the image results but are not directly responsible for other functions.

“Operator training” means the training received in accordance with the manufacturer’s specifications of the WBI device, any Departmental training, and the standards contained in ANSI/HPS N43.17-2009 (as amended).

“Radiation exposure badges” means a badge in the immediate area of the WBI device.

“Radiation Safety Coordinator” means an established set of duties and responsibilities assigned to an individual, who is determined by the facility Warden, responsible for administrating the radiation protection program for the WBI system and facility.

“Radiation survey” means a survey required by manufacturer specifications or ANSI/HPS N43.17-2009 (as amended).

“Supervisor” means the staff supervising daily operation of the WBI device who can perform all functions of the operator level and who are authorized to accomplish password-protected functions as determined by the Warden and as specified by the manufacturer’s manuals and procedures.

“Whole Body Imaging” is a low dose, non-medical, ionizing radiation system used to body scan inmates, staff and all visitors to produce an x-ray image of the entire body in order to detect and prevent the possession and introduction of contraband.

“X-ray property screening system” means a device used for non-medical screening, non-human materials (i.e. personal belongings, mail, packages), to detect and deter contraband.

Policy Number	Effective Date	Page
8.10	December 8, 2021	2

II. POLICY and PROCEDURE

A. Radiation Safety Program

1. The use of Whole Body Imaging (WBI) on staff, visitors, and inmates or an X-ray property screening system shall be for the purpose to mitigate the introduction, possession, and use of weapons and other contraband within DOC facilities to protect institutional security, staff, visitors, and inmate safety.
2. The Radiation Safety Coordinator shall ensure the WBI device and X-ray property screening system is registered and complies with any applicable Federal, state, and local regulations.

B. Radiation Dose Limitations

1. The radiation dose delivered to a human subject should be as low as reasonably achievable, while meeting the desired detection performance.
2. The radiation dose delivered to the operator of a WBI device should not exceed an annual effective dose of 1 millisievert (1 mSv). Subjects being scanned shall not exceed an annual effective dose of 250 millisievert (250 mSv).
3. An inspection zone should be established around the WBI device where bystanders are prohibited while the device is in use. Radiation doses outside this inspection zone should not exceed 2 micro-rem in any one (1) hour.
4. Pregnant and potentially pregnant individuals shall not be screened. Individuals with a non-pregnancy medical condition that may receive adverse effects from WBI screening shall not be screened. Any individual with such status shall inform institutional staff prior to being screened and provide written medical documentation.

C. Scheduled Maintenance

The Radiation Safety Coordinator shall supervise necessary device maintenance and repairs according to manufacturer specifications. Maintenance and radiation surveys are to be performed only by qualified individuals, preferably the manufacturer's representatives. The Maintenance Branch Supervisor or designee shall document and maintain all maintenance and repairs performed on the device.

Policy Number	Effective Date	Page
8.10	December 8, 2021	3

D. Radiation Survey

1. The Radiation Safety Coordinator shall supervise the completion of all radiation surveys;
2. Radiation survey results shall include, at a minimum, subject dose, radiation leakage, inspection zone, and any other parameter required by the manufacturer.
3. Radiation surveys shall be performed at all of the following:
 - a. Upon installation;
 - b. At least once every twelve (12) months;
 - c. After any maintenance that affects the radiation shielding or X-ray production components;
 - d. After any incident that may have damaged the system in such a way that radiation leakage may occur; and
 - e. As required by the manufacturer.

E. Radiation Exposure Badge

A radiation exposure badge shall be provided for WBI devices. The badge shall be exchanged quarterly or per manufacturer's specifications; used badges shall be sent to a laboratory for testing. The Radiation Safety Coordinator accountable for WBI equipment is responsible for providing, collecting, and testing badges. Test results shall be made available to staff operating the WBI machines or X-ray property screening system upon request.

F. Training

1. The Radiation Safety Coordinator, in collaboration with the DOC Division of Training, shall ensure staff operating the WBI system and X-ray property screening system are trained to use the device in accordance with the manufacturer's specifications. Staff shall be expected to comply with the training requirements outlined in ANSI/HPS N43.17-2009 (as amended). At a minimum, training shall include:
 - a. Radiation safety training, including:
 - i. Types of radiation.
 - ii. Sources of magnitude of common exposures.
 - iii. Units of measurement.
 - iv. Time, distance, and shielding.
 - b. Basic risk communication concepts.
 - c. Biological effects of radiation and radiation risks.
 - d. Pre-operational checks.

Policy Number	Effective Date	Page
8.10	December 8, 2021	4

- e. Subject positioning.
- f. Image interpretation.
- g. Threat and contraband recognition
- h. Operating and emergency procedures to include response to warnings, malfunctions or damage.
- i. Safety hazards (e.g., unauthorized disassembly of the system).
- j. Physical security procedures to prevent unauthorized use or access.
- k. Operator awareness and control of inspection zones.
- l. Maintenance.
- m. Familiarity with the information being provided to the inmate.
- n. Concept of “As Low As Reasonably Achievable” (ALARA).
- o. Supervised practical operations.
- p. Requests for medical accommodations and scan exclusion.
- q. Administrator training.

2. Other employees who work around the WBI system or shall be scanned by the system repetitively as a condition of employment, but are not directly associated with its operation, shall be provided with the following training annually:

- a. Basic radiation awareness training;
- b. Safety rules pertaining to radiation and other hazards;
- c. Promptly reporting any condition which may lead to the violation of this rule or any unnecessary exposure to radiation.

3. Refresher training shall be provided at least every 12 months.

4. Periodic updates shall be provided when the WBI system or relevant threats change.

5. Operator training records, to include the confidentiality acknowledgement form, shall be maintained by the facility and according to the Division of Training requirements.

6. Training records shall include at a minimum an outline of the training and attendance sheet with date and signatures of attendees.

G. Required Signage

- 1. Signs shall be conspicuously posted indicating that all members of the public shall stand behind designated locations during the scanning process.
- 2. The Radiation Safety Coordinator shall ensure the Kentucky Cabinet for Health & Family Service radiation regulations is posted in a sufficient number of places within the institution.

Policy Number	Effective Date	Page
8.10	December 8, 2021	5

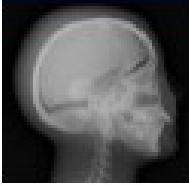





3. The facility shall post conspicuous signage indicating where individuals should stand in areas adjacent to WBI usage (signs indicating that subjects should not proceed beyond “this point” while scanners are in use).
4. A sign shall be posted in an area visible to an individual immediately prior to being screened that compares the dose of a commonly known source of radiation to the dose to be delivered.
5. A sign shall be posted that advises pregnant and potentially pregnant females that they may not be screened by a WBI and that they may follow CPP 9.23, Whole Body Imaging.
6. Signs required by paragraphs 2.–5. of this section shall be in English and Spanish.

H Documentation

1. The Warden shall determine who shall retrieve and maintain all records in regard to the Radiation Safety Program. The Radiation Safety Coordinator shall ensure that all required forms and notices are completed and forwarded to appropriate staff designated for recordkeeping. DOC staff shall be expected to comply with recordkeeping requirements outlined in ANSI/HPS N43.17-2009 (as amended), and the Kentucky Records Retention Schedule.
2. The Radiation Safety Coordinator or designee shall collect and maintain the evidence to show the dose limits outlined above are being met and the number of scans routinely conducted on staff and inmates does not exceed the ANSI Standard.
3. The Institutional Training Coordinator shall ensure each operator’s training records are current and maintained, including sufficient information to show compliance with the training requirements outlined in this policy.
4. The Institutional Maintenance Supervisor or designee shall maintain any records of radiation surveys, upgrades, modifications, maintenance, and repair records for the life of the system.

Typical Radiation Exposures

ADDITIONAL SAMPLES OF TYPICAL RADIATION EXPOSURES

	X-ray tomography of the skull	50,000 (max) 10,000 (typically)
	Teeth radiography	5,000 (max) 1,000 (typically)
	Thorax radiography	400 (max) 100 (typically)
	Flight by aircraft	Time
	Paris – Washington	8.00 hr. 41
	London – New York	7.30 hr. 37
	New York – Los Angeles	6.15 hr. 24
	London – Rome	2.30 hr. 12.3
	London – Frankfurt	1.35 hr. 7.2
	Natural radiation background (for 24 hours)	2.7-13
	Person exposure dose at the Scanner per scanning session	0.25

Inmate Information Sheet on Whole Body Imaging Devices

Background:

The possession and use of weapons and other contraband by inmates seriously jeopardizes the overall safety and security of our institutions for both staff and inmates. The Whole body Imaging System Program is being introduced to complement already existing procedures for contraband detection that include metal detectors, X-ray machines, alcohol and drug detection devices, etc. In some cases, inmates must submit to the Whole body Imaging System as a requirement for working in certain areas.

Safety and Privacy:

FDA has approved the use of these devices including those screening systems that use low-dose backscatter and transmission ionizing radiation technology. All these technologies have been proven to be safe and effective for screening members of the general public as well as safe for both operators and those in the vicinity of the operating device. People are exposed to ionizing radiation every day, much of it naturally occurring in the environment.

The same type of radiation is found in our food supplies and in many consumer products such as smoke detectors. Everyone who flies in an airplane receives ionizing radiation. For comparison, 50 scans from a typical whole body imaging device that uses ionizing radiation is the equivalent to about 2 hours of air travel at 39,000 ft.

How it works:

Inmates shall stand in front of the device with their legs spread slightly and arms extended away from their sides while the scan is taken, this takes approximately 8 seconds to process. The number of scans required at one screening is based on the technology deployed. Should the subject move during the scan, the scan will be repeated. For whole body imaging devices utilizing ionizing radiation, several federal guidelines/standards such as ANSI Standard ANSI/HPS N43.17-2009 (as amended), NCRP Commentary No.16, and ISCORS Technical Report 2008-1 dated July 2008 all provide additional guidance.