

SPECIFIC OPERATIONS CHECKLIST

IONIZING RADIATION DOSIMETRY
(formerly called Personnel Radiation Dosimetry)

Instructions to the Assessor: Examine staff members' notebooks, calibration/verification records, equipment maintenance logs, and other records where necessary to verify discussion with staff members and observation of their performance in processing selected dosimeters. Be particularly observant for inconsistencies among records, procedures, observations, and responses. Note and discuss any inconsistencies with the Technical Director. In completing this checklist, indicate N/A for those items not applicable to the processor's dosimetry system or processing procedures.

Where practical, observe a demonstration of critical processing activities for requested radiation categories. Examine required equipment and instruments. Interview staff members responsible for routine processing, as well as those conducting the demonstration.

Place an "X" beside any of the following items which represent a deficiency. Place a "C" beside each item on which you are commenting for other reasons. Record the item number and your deficiency explanations and/or comments on the comment sheet(s). Place a check beside all other items you observed or verified at the laboratory.

Note: The checklist items with an "E" superscript apply to electronic personnel dosimeters as well as other types of processing equipment. Section 13 of the checklist applies to extremity dosimeter processing only, and Section 14 applies to the use of electronic personnel dosimeters only.

1 Personnel

- _____ 1.1 ^E The qualifications of the individual who has overall technical responsibility are consistent with the position description.
- _____ 1.2 ^E The individual having technical responsibility demonstrated technical knowledge and management control of processing operations and services.
- _____ 1.3 ^E A qualified individual exercises authority in assignment of processing tasks and the timely processing of dosimeters.
- _____ 1.4 ^E Staff personnel are generally qualified and competent.
- _____ 1.5 ^E Communication seems adequate between technical and supervisory staff.
- _____ 1.6 ^E Staff are not subjected to undue pressure or inducement that can influence their judgement or the results of their work.
- _____ 1.7 ^E Staff members are aware of the extent of their area of responsibility.

- ___ 1.8 ^E Staff members are not assigned duties beyond their demonstrated competence.
- ___ 1.9 ^E Staff size is sufficient to handle the workload.
- ___ 1.10 ^E Job descriptions (Authorized Representative, Technical Director, Approved Signatory, individuals that conduct processing protocols, and individuals that review and approve the processing results) are current and reflect duties. Equivalence or exceptions to the required qualifications are documented.
- ___ 1.11 Staff responsibility is clearly assigned for:
 - ___ a) ^E overall technical direction;
 - ___ b) ^E routine maintenance, verification and service of equipment;
 - ___ c) ^E periodic calibration of major equipment;
 - ___ d) ^E final review and approval of data; and
 - ___ e) ^E review and resolution of questionable data.
- ___ 1.12 ^E The staff training program is implemented as documented.
- ___ 1.13 The training program includes:
 - ___ a) ^E a period of close supervision until competency is demonstrated;
 - ___ b) ^E a mechanism for evaluating and informing staff members of the adequacy of their performance in conducting assigned processing protocols;
 - ___ c) ^E documentation of specialized skills required to perform duties;
 - ___ d) ^E provisions for retraining staff members when protocols are revised;
 - ___ e) ^E adequate training of high turnover or temporary staff; and
 - ___ f) ^E a record of training courses completed by each staff member.
- ___ 1.14 ^E The procedures for ensuring the competency of staff members are implemented as documented.
- ___ 1.15 ^E Competency of staff members is reviewed at least annually.
- ___ 1.16 ^E Records of the competency reviews, including dates and findings, for the staff members are maintained.
- ___ 1.17 ^E Appropriate action is taken when competency is not demonstrated, such as retraining, until competency is obtained.

2 Dosimeter Handling (General)

- 2.1 Procedures are documented and implemented as written for:
 - a) ^E satisfactory acceptance of dosimeter materials to verify that dosimeter materials meet the criteria/specifications for type, size, or other significant parameters, such as sensitive elements and filter materials type and proper size (area, thickness), correct dosimeter holder material;
 - b) checking the proper assembly of dosimeters such as placement of filters and sensitive elements;
 - c) ^E a system for identification of dosimeters;
 - d) ^E ensuring that in-service dosimeters are checked on a defined schedule or frequency to ensure that all necessary components are in place;
 - e) monitoring environmental parameters including background radiation in all areas where dosimeters are handled or stored; and
 - f) ensuring that dosimeters are suitably packaged for issuance to clients to prevent damage or unknown exposure during transit.

- 2.2 Procedures are documented and implemented as written for the receipt of in-service and background control dosimeters at the processor's facility including:
 - a) ^E individual dosimeter identification, associated dosimeter type, and appropriate processing protocols to be followed;
 - b) identification of internal and external control dosimeters;
 - c) ^E a mechanism for tracking individual dosimeters and/or sensitive elements through the processing cycle;
 - d) a mechanism for identifying dosimeters which have not been returned from clients for processing;
 - e) ^E method for screening incoming dosimeters or sensitive elements for radioactive contamination prior to readout;
 - f) method for identifying mishandled background control dosimeters.
 - g) handling/storage areas which are commensurate with types and numbers of dosimeters handled/stored and categorized by stage of operation; and
 - h) the handling of late returned dosimeters.

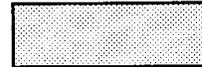
- _____ 2.3 ^E Records indicate that clients are promptly notified in writing, if applicable, of any radioactive contamination found on dosimeters received for processing.
- _____ 2.4 ^E Clients are supplied the same dosimeter types or models (sensitive elements and holder), as were proficiency tested.
- _____ 2.5 ^E Written information is exchanged with the external client regarding dosimetry services provided, including as applicable:
 - _____ a) ^E radiation type to be monitored;
 - _____ b) ^E dose definition (terminology);
 - _____ c) ^E responsibility for handling dose of record;
 - _____ d) ^E calibration procedures used in dose determination quality control;
 - _____ e) ^E special processing procedures to be used as part of the dosimetry service;
 - _____ f) directions for handling and use of background control dosimeters;
 - _____ g) ^E identification of anomalies noted during processing; and
 - _____ h) ^E precautions to avoid contamination of dosimeters.

3 Dosimeter Identification

- _____ 3.1 ^E Sufficient information is contained in the dosimeter identification code to allow correlation with the processor's record system.
- _____ 3.2 The identification system is adequate to assure correct identification of demountable (non-fixed) as well as fixed dosimeter elements and the relationship of each element to a position or filter in the dosimeter.

4 Dosimetry - General

- _____ 4.1 ^E Documentation of the dosimetry system is available to the staff which contains:
 - _____ a) ^E lower and upper limits of reliability for the dosimetry system in each radiation category of interest;
 - _____ b) ^E specifications with a minimum and maximum level of exposure which each model dosimeter is capable of recording during routine processing;
 - _____ c) ^E established criteria/specifications for all systems and dosimeter materials;



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- _____ d) ^E the energy and dose response of each type or model of dosimeter used;
- _____ e) ^E procedures to be implemented when any processing equipment fails to meet performance specifications; and
- _____ f) ^E procedures for system calibration.
- _____ 4.2 ^E All necessary items of equipment for the correct performance of processing activities are on hand.
- _____ 4.3 ^E Physical facilities, e.g., benchspace, utility services, and safety equipment, are adequate to accommodate processing activities.
- _____ 4.4 ^E No environmental interference is apparent from other nearby activities especially those involving radiation.
- _____ 4.5 ^E There is agreement between assigned processing responsibilities and those technical areas addressed in the training program.
- _____ 4.6 ^E All written and approved procedures are available to the staff.
- _____ 4.7 ^E Each processing protocol is documented in sufficient detail to allow performance by a competent technician.
- _____ 4.8 ^E All staff follow written processing procedures.
- _____ 4.9 ^E Dosimetry processing equipment is sufficiently identified to correlate with calibration records.
- _____ 4.10 ^E Adequate controls are in place to assure the performance of equipment to those levels of precision and accuracy defined by the processor in each processing protocol.
- _____ 4.11 ^E Records are available for all processing equipment showing preventive and repair maintenance conducted to ensure stability of equipment performance.
- _____ 4.12 ^E Continuity of equipment operation has been adequately provided for through service contracts or in-house maintenance capability and parts inventory.
- _____ 4.13 ^E A record is maintained of processing activities (e.g., dated log) with sufficient identification to allow correlation with calibration/verification and control system records.
- _____ 4.14 ^E The dosimeter tracking system assures that each measurement is identified and recorded at the time of determination.
- _____ 4.15 Each processing protocol provides for the interspersing of quality control (QC) dosimeters for each set of dosimeters processed (should be a minimum of three).



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- ____ 4.16 ^E Irradiation of quality control dosimeters is conducted with suitable sources and records indicate good reproducibility for the method of irradiation.
- ____ 4.17 Appropriate safeguards are used to prevent subversion of quality control dosimeter audits.
- ____ 4.18 ^E The processor has documented and established the frequency of the use of either irradiated or non-irradiated dosimeters based upon total number of dosimeters processed, equipment stability, type of quality control checks used or other suitable means.
- ____ 4.19 ^E A procedure is documented and implemented as written for conducting a detailed review of data produced between the last successful quality control dosimeter and the first quality control dosimeter which fails to meet established control limits.
- ____ 4.20 ^E The procedures system identifies how procedures will be controlled, revised, deleted, and issued. A system for controlling program requirements will be in place within the procedures system.
- ____ 4.21 ^E Dosimeters are processed and reports issued objectively without influence from other areas within the organizational structure.

5 TLD Dosimetry

- ____ 5.1 Procedures are documented and implemented as written to ensure that:
- ____ a) TLD's are subject to an adequate annealing cycle which is reproducible regarding time, temperature, cooling rate, humidity, and light prior to issue;
- ____ b) precautions are taken to minimize light exposure of TL materials;
- ____ c) precautions are taken to avoid contamination of TL elements (e.g., chalk, dust, grease, or any radioactive material);
- ____ d) loading of sensitive elements is performed in a well-defined order to prevent confusion in handling visually-similar elements of different TL materials;
- ____ e) fading of TL materials, under normal conditions, is documented and accounted for over the period of intended use; periodic rechecks on fading are conducted, if necessary (fading may vary among TL material, manufacturing batches, or following changes in heating cycle); and
- ____ f) TL material for each dosimeter type or model is capable of withstanding heat treatment required in processing.

- _____ 5.2 Sufficient measurements have been made and documented to establish the relationship of the TL emission characteristics and the conversion factor between instrument reading and dose equivalent.
- _____ 5.3 Technicians appear to understand operating conditions and critical functions of TLD processing equipment such as heating/temperature cycle, inert gas purging, annealing cycle, and recognition and resolution of equipment failure.
- _____ 5.4 Equipment for reading out and annealing TL elements is appropriate.
- _____ 5.5 The annealing oven or furnace is reserved for dosimetry annealing.
- _____ 5.6 Procedures are documented and implemented as written for:
 - _____ a) establishing and checking appropriate operating conditions for instrumentation which may include:
 - reproducible positioning of the TL element in the reader;
 - stabilization against voltage change or drift in dark current;
 - reproducible heating cycle which ensures readout of a consistent fraction of relevant stored energy;
 - glow curve output;
 - inert gas purging;
 - digital readout;
 - fading, linearity;
 - _____ b) removing TL sensitive elements from the dosimeter case which minimizes the potential for loss of information from the sensitive element;
 - _____ c) checking the TLD reader operation and stability at least daily, when used, using pre-irradiated dosimeters or light sources;
 - _____ d) loading/unloading the TLD reader;
 - _____ e) review of selected dosimetry data during the processing cycle;
 - _____ f) checking to ensure that adequate annealing is accomplished;
 - _____ g) review of glow curves, if they are captured.

6 Film Dosimetry

- _____ 6.1 Procedures are documented and implemented as written to ensure that:
 - _____ a) prior to issue, film is stored unopened in a cool, dry, low radiation background location which is free from chemical vapors or other deleterious agents;



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- _____ b) film is current and is stored in a manner to reduce build-up of density due to natural background and/or old age deterioration;
 - _____ c) each film emulsion batch received is tested to check that fog level, dose-density, and spectral characteristics are satisfactory, and a record is maintained by film emulsion number; and
 - _____ d) acceptance procedures verify that film received meets specifications and ensures that the film's expiration date is sufficient for the film to be used at the anticipated time of processing.
- _____ 6.2 Adequate equipment, facilities, and materials to support the film processing operations including developing, stop bath, fixing, washing, drying, and densitometry are in place.
 - _____ 6.3 Film processing darkroom is temperature-controlled, has adequate ventilation, properly installed safelights, and preferably has incandescent lighting.
 - _____ 6.4 Safelights used in darkrooms are tested at prescribed intervals to measure the fog-level of films exposed at the normal working distance from the safelights for a period comparable in length to maximum processing time.
 - _____ 6.5 Tanks and equipment which hold or are exposed to processing solutions are chemically inert and kept clean.
 - _____ 6.6 Densitometry equipment capable of measuring appropriate film densities is in place and adequate to support the workload.
 - _____ 6.7 Records demonstrate the accuracy and reliability of all instruments used to determine gross density of field and control films:
 - _____ a) densitometer performance is checked before use; and
 - _____ b) densitometers are calibrated at a frequency recommended by the manufacturer, every 6 months, or as directed in the processing protocol, whichever is more frequent.
 - _____ 6.8 Quality control films are used to establish the dose density characteristics of each film emulsion batch.
 - _____ 6.9 Groups containing at least three quality control films of the same emulsion/lot exposed to known doses which bracket exposure ranges of the dosimeters to adequately check the response curve of the dosimeter type are included in each processed batch. Such group controls are positioned at the beginning and end of each processing batch and at intervals as defined in the processing protocol.
 - _____ 6.10 At least two unexposed films of the same emulsion/lot are included in each processed batch.

- ___ 6.11 Records show that temperatures and times for development, stop bath, fixing, washing, and drying are controlled and consistent with processing protocols.
- ___ 6.12 Developer/fixer solutions are maintained under cover to reduce oxidation and exclude contamination.
- ___ 6.13 During development, the developing solution is agitated to provide for uniform development of all film.
- 6.14 Procedures are documented and implemented as written for:
 - ___ a) ensuring that processing chemicals are dated, are properly stored, and discarded upon expiration of shelf life;
 - ___ b) defining the frequency for replenishing processing solutions according to time in use or number of films processed;
 - ___ c) controlling all chemistry and processing conditions;
 - ___ d) for use and renewal of a stop bath;
 - ___ e) fixing and washing films;
 - ___ f) maintaining the temperatures in processing solutions;
 - ___ g) defining and maintaining drying temperatures;
 - ___ h) removing film from wrappers in the darkroom and maintaining them in identifiable order for processing;
 - ___ i) taking precautions to prevent accidental exposure of the films to light while being processed;
 - ___ j) use of control films to verify that processing meets control limits during routine processing activities;
 - ___ k) storing films after processing to minimize damage to the emulsion; and
 - ___ l) examining films for non-uniform blackening and defining a special measurement procedure for those showing significant non-uniform blackening.

7 Track Etch

- ___ 7.1 Track detectors are evaluated using optical or counting equipment appropriate for the anticipated macro- or microscopic track dimension.
- ___ 7.2 Chemicals used are of the appropriate solution and quality.

- 7.3 Voltage stability and automatic shutdown in case of "sheeting" is utilized when electro-chemical track etch is performed.
- 7.4 If multiple staff operators or instruments are used, appropriate intercomparisons are performed to ensure equivalency.

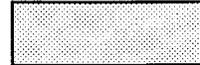
8 Dose Assessment and Reporting

- 8.1 Satisfactory documentation of the algorithm exists to indicate its validity for dose interpretation:
 - a) algorithm was created and tested using fundamental data which are retrievable;
 - b) sources of uncertainty arising from the use of the algorithm are understood and documented;
 - c) process controls were considered and documented in the development of the algorithm;
 - d) attributes and limitations of the algorithm are documented;
 - e) algorithm changes are tested, recorded, and documented; and
 - f) a revision log is maintained.
- 8.2 Differences, if any, between the algorithm(s) used for proficiency testing and those used for client dose reporting are documented.
- 8.3 Differences between algorithms used for different clients are documented.
- 8.4 Protocols for routine processing are defined and can be shown to be consistent with NVLAP proficiency testing procedures.
- 8.5 Data are reviewed by the Technical Director or his designee prior to being reported to the client.
- 8.6 ^E A procedure exists for the investigation, documentation and resolution of anomalies.
- 8.7 ^E An adequate report of dose is sent to the client and includes as applicable:
 - a) ^E name and address of processor;
 - b) ^E pertinent dates and identification of dosimeter including client and corresponding processor identification codes;
 - c) ^E client name;

- _____ d) ^E identification of the dosimeter and/or elements including the radiation category;
- _____ e) ^E "Occupational Radiation Exposure Report" or a similar title;
- _____ f) ^E an explanation of any deviation from the protocol routinely used in processing dosimeters which may affect the reported dose (i.e., mishandling of background control dosimeter by client);
- _____ g) ^E identification of anomalies, including contamination of the dosimeter;
- _____ h) ^E signature or reference to person having technical responsibility (NVLAP "approved signatory" when report references NVLAP); and
- _____ i) ^E all additional items required by the processor's test plan appear in the test report.

9 Quality Assurance Implementation

- _____ 9.1 ^E Internal audits are performed to assure that no degradation of performance occurs.
- _____ 9.2 ^E The quality assurance program includes processing checks, such as:
 - ^E - processing controls (e.g., light source readings, microprocessor controls);
 - blind audit dosimeters unknown to the technician;
 - unexposed dosimeters;
 - ^E - intercomparison programs.
- _____ 9.3 ^E Technicians are familiar with and perform the quality control program.
- _____ 9.4 ^E The quality assurance program is organized to assess variability of test results among staff members, or separate equivalent systems at the same or different locations (subfacilities).
- _____ 9.5 ^E Results of audits are examined by the Technical Director or designee, and action is taken to correct any deficiencies.
- _____ 9.6 ^E Records of participation in intercomparison programs or external measurement assurance programs demonstrate consistency with practices documented.
- _____ 9.7 ^E Records and practices observed from the point of dosimeter receipt through to final delivery of data to the user indicate consistency with documented procedures.
- _____ 9.8 ^E The processor has an established written plan for bringing back-up equipment into service or using the services of another NVLAP-accredited processor to



assure continuity of service when dosimetry systems or personnel fail to perform within limits of control.

- ____ 9.9 ^E Record retention duration and locations will be specified in writing.
- ____ 9.10 ^E Records of prior performance tests should be analyzed for trends and degradation of test performance.

10 Calibration

- ____ 10.1 ^E Dosimetry systems are calibrated to known doses from radioactive sources or radiation generating machines. The dose in a radiation field is measured using an NIST-traceable instrument or is based on the measurement of flux or emission rate of a source traceable to primary radiation standards.
- ____ 10.2 ^E Calibration sources used are appropriate for the type of radiation to be interpreted by the dosimeter.
- ____ 10.3 ^E Calibration/verification records for major equipment items for dosimetry processing include the following:
- ____ a) ^E equipment name or description;
 - ____ b) ^E manufacturer name;
 - ____ c) ^E model, style, serial number, or other identifying mark;
 - ____ d) ^E notation of equipment variables requiring calibration/verification;
 - ____ e) ^E range of dose measurements for which calibrations have been conducted;
 - ____ f) ^E allowable error (taking into consideration instrument tolerance) to coincide with requirements of each processing protocol;
 - ____ g) ^E schedule for periodic calibrations including calibration/verification date;
 - ____ h) ^E date and result of last calibration/verification including assessed uncertainty of measurement;
 - ____ i) ^E identification of staff member or position responsible for equipment calibration or external service performing calibration; and
 - ____ j) ^E identity of reference standards used.
- ____ 10.4 ^E Calibration and verification practices for dosimetry systems for all processing protocols are described in the QA documentation identifying calibration services, reference materials, and measurement assurance programs used.

- _____ 10.5 ^E Calibration of equipment is verified at regular intervals which are determined by equipment type, manufacturing specification, accumulated stability data, or other reasonable plan such that a high degree of confidence is demonstrated in measurements made by the processor.

11 Computer Operations

- _____ 11.1 ^E All computer software used in the processing cycle is properly validated and verified prior to use and periodically thereafter.
- _____ 11.2 ^E Data transfers between processing and computing equipment are accomplished without loss of data, and verification is performed.
- _____ 11.3 ^E All computer software associated with the processing system(s) is fully documented.
- _____ 11.4 ^E Integrity of data files are protected by systematic redundancies, such as adequate back up at regular intervals.
- _____ 11.5 ^E Appropriate controls are in place for software and data security, and to preclude inadvertent or unauthorized changes.

12 Subfacilities

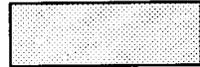
- _____ 12.1 ^E The main facility maintains all QA documentation and procedures and assures that all subfacilities are consistent in their processing activities.
- _____ 12.2 Comparative tests are conducted to assure consistency of dosimetry data developed between the main facility and the subfacility.
- _____ 12.3 ^E The subfacility receives all QA and procedural direction from the main facility.

13 Extremity Dosimeters (Complete this section only if the laboratory is applying for accreditation for extremity dosimetry.)

- 13.1 Written procedures are followed for:
- _____ a) incoming inspection of all dosimeter components (e.g., holders, rings, film and dosimeters themselves). The processor should include purchase specifications for the dosimeter materials within this procedure.
- _____ b) the inspection of in-service dosimetry at the specified frequency. The procedures address a means for removing from service dosimeters that do not meet the inspection criteria. This step does not apply to single-use dosimetry.



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- ___ 13.2 Each extremity dosimeter is uniquely identified and provisions are made for identifying which extremity the dosimeter is used to monitor.
- ___ 13.3 For single-element dosimeters, the processor has written procedures for determining element correction factors or batch corrections for extremity TLDs that establish the dosimeter response to dose.
- ___ 13.4 Written procedures exist for instructing personnel on the proper use of and proper geometry for wearing extremity dosimeters.
- ___ 13.5 Written procedures are followed which ensure that the extremity dosimeters are consistently processed in a uniform geometry.
- ___ 13.6 Written procedures are followed for describing what actions should be taken in the event of anomalies (i.e., checking the reader for proper dose assessment, PM tube light output, dark counts, side irradiations, etc.)
- ___ 13.7 Documentation exists which describes the dosimeter characteristics and algorithm development methodology, and demonstrates its relationship to the NVLAP proficiency testing standard (ANSI N13.32).
- ___ 13.8 A process is in place to determine the dose of damaged or environmentally stressed dosimeters.
- ___ 13.9 For dosimeters that are reused, a procedure and criteria exist to periodically evaluate the response and accuracy of each dosimeter.
- ___ 13.10 Procedures exist for the assembly and maintenance of extremity dosimeters.
- ___ 13.11 An angular dependence study must be documented describing the dosimeter response to radiation exposures at angles of incidence of +/- 30 degrees, +/- 60 degrees both in the horizontal and vertical planes for each dosimeter used and each category monitored (except for categories I, II, and VI).
- ___ 13.12 The processor has successfully participated in proficiency testing for each dosimeter type in the appropriate categories for which monitoring services are provided.
- ___ 13.13 A study has been documented to show the upper and lower limit of detection and reliability?
- ___ 13.14 Extremity dosimeters are included in the Quality System and manual.
- 14 *Electronic Personnel Dosimeters (EPD) (Complete this section only if the laboratory is applying for accreditation for the use of electronic personnel dosimeters.)***
- ___ 14.1 Has the laboratory or the manufacturer established an initial calibration of the EPD dosimeter capable of dose measurements within the specified tolerance



range for the appropriate radiation category monitored? Will the initial calibration data be used to indicate trends in the dosimeter measurement performance?

- ___ 14.2 Is there a procedure for periodic recall and adjustment, repair and calibration to maintain the required measurement accuracy of the dosimeter?
- ___ 14.3 How has the calibration frequency been determined; are previous calibration data points used for trending and/or control charting to monitor dosimeter performance over time and stability?
- ___ 14.4 Has a procedure been established for the tracking of problems, failures and anomalies that occur during use or are reported by the users, and are they recorded? Is there a procedure in place for investigating these problems and are the corrective actions documented?
- ___ 14.5 Has the data transfer function between the dosimeter and the separate unit reader or computer database been verified and tested, if applicable? Is there a procedure in place for investigating these problems and are the corrective actions documented?
- ___ 14.6 Does the quality control program include radiation source checks and has a frequency for the QC checks been established? Are there upper and lower control limits placed on the QC data to determine if the unit should be taken out of service for calibration?
- ___ 14.7 Has the unit been proficiency tested for the radiation categories/types and energy ranges for which the dosimeter is used to monitor and the laboratory is seeking accreditation?
- ___ 14.8 Has the laboratory staff been trained on the procedures and instructions for use of the EPDs? Have the procedures for training been documented and are training records available?
- ___ 14.9 Are user instructions available for personnel assigned the dosimeters and is training provided on use of the EPD dosimeter?
- ___ 14.10 Is a dose algorithm used or are correction factors applied to the EPD data to determine dose of record?
- ___ 14.11 If applicable, is the algorithm documented and its performance validated? Differences, if any, between the algorithm(s) used for proficiency testing and those used for client dose reporting are documented.

