



**CSDA Environmental Safety/Infection Control Committee
DEEP Compliance Resource Report
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This document was compiled by the CSDA Environmental Safety/Infection Control Committee (ES/IC) in 2009 with the help of Mr. Ken Price of the UCONN Health Center and Dr. Alan Laurie of the UCONN Dental School, Dept of Radiology. It is intended to help CT dentists comply with state radiation safety regulations. It must be noted that this is considered a “draft” resource as state statutes and regulations change over time. Once you have read this material should you have additional questions please feel free to contact your district representative on the ES/IC Committee.

Introduction

The State of Connecticut’s Department of Energy and Environmental Protection, Bureau of Air Management, Division of Radiation (DEEP) is the enforcement group tasked with the responsibility of ensuring x-ray machines are operating in accordance with manufacturers specifications and that radiation exposures to dental staff and the general public are maintained below regulatory limits and are maintained as low as readily achievable (ALARA). To this end, the Division of Radiation conducts routine random inspections of dental offices within the State to ensure compliance with the State of Connecticut’s Statutes and Administrative Regulations. Typically, advanced notification of an impending inspection will be provided. Inspections usually require approximately one hour for an office having one tube and inspectors are accommodating to patient needs. If the inspector identifies items of non-compliance it will result in a formal Notice of Violation (NOV) being issued from the Division of Radiation. The intent of the NOV is to ensure any identified areas of non-compliance are corrected as soon as is practical. In most cases, a satisfactory response in a timely manner to the Division of Radiation is sufficient for closure. A NOV does not imply assessment of fines or legal action provided timely corrective actions are taken.

Purpose

This purpose of this correspondence is to provide guidance for dentists in the State of Connecticut regarding compliance requirements and professional resources available for assistance. The Department of Energy and Environmental Protection’s Division of Radiation may be called for any questions and/or clarifications at 860.424.3029.

Professional Assistance

Many of the requirements for demonstrating x-ray machine compliance are very technical and the measurements needed require the use of specialized radiation monitoring equipment. Members of the Connecticut Chapter of the Health Physics Society and the

Connecticut Association of Medical Physicists are qualified experts for performing such services. Addendum I contains of listing of individuals who have stated they would be available for dental x-ray unit compliance surveys. In most instances, the fees are reasonable for these services. It should be noted that the State regulations do not specify a frequency of x-ray machine surveys. However, certain compliance items can only be determined by performing such surveys. Retaining a consultant will not ensure a compliant inspection if the x-ray unit fails in some category after the consultant's visit. *It is recommended that an initial survey of all dental units in your Office be made to demonstrate compliance, and that follow up surveys be performed if a dental unit is replaced, repaired, moved and/or you notice quality control problems with your images.* More frequent surveys would be done at the Dentist's discretion.

Recommendations to Minimize the Chance of a Non-Compliant Inspection

You should recognize that after all possible actions you have taken, a non-compliant inspection could result. The object of these recommendations is to minimize the likelihood of a NOV.

State Registration

The Connecticut Administrative Regulations require that each x-ray tube intended for human use be registered with the State. For non-State facilities, a biennial fee of \$190.00 per x-ray tube is required. New tube registrations can be accepted at any time, but **must be** completed before patient use. Renewal of x-ray tube registrations are required every two years on the even year by 4/30/2016, 4/30/2018, and 4/30/2020 and so on.

Registrations are now being done online at:

<https://filings.deep.ct.gov/DEEPPortal/Account/>.

After registering online you will be emailed a confirmation of registration and this must be current and readily available when requested.

Written Radiation Safety Practices

You should have in place a written policy on managing pregnant staff, managing pregnant patients, prevention of holding patients during dental x-ray exams and a policy for issuing radiation monitoring badges (or not). The actual risk to the fetus of a pregnant staff member or patient is minimal, and such policies are needed primarily for litigation purposes. All staff should be familiar with all office policies. The DEEP may review these policies and practices during an inspection. The basics of such policies would include:

Pregnant Staff

Develop a form that the staff member may use to DECLARE their pregnancy. Unless a pregnancy is declared, the annual dose limit for the staff member applies. Should a staff member declare their pregnancy in writing, exposure must be limited to 50 mrem maximum per month. This can be demonstrated by the issuance of a monthly monitoring

badge during pregnancy, or using calculations based upon the results of the machine survey performed by the radiation professional. Retain all related records.

Pregnant Patients

It is recommended that all potentially pregnant females be asked to sign an informed consent that asks if they are or potentially pregnant. If they indicate they are pregnant, inform them of the risk of the exposure and obtain their written consent for the examination. You may want to include the use of a lead apron over the abdomen as part of this policy. Retain this information.

Holding/Supporting Patients

Unless a medical emergency exist, a policy should be developed that forbids holding or supporting a patient during an x-ray exam. Retain this policy.

Radiation Monitoring Badge Policy and Documentation of Quarterly Staff Doses

Develop a policy for the use (or non use) of radiation monitoring badges. If you decide to issue monitoring badges, review and file all reports. The radiation professional performing the x-ray survey can provide a justification for not issuing radiation monitoring badges based on the number of films per month, distance from the x-ray unit the staff remains during an x-ray, adherence to proper procedures and use of measurement data. Retain this policy and supporting documentation.

Develop a Technique Chart

You should develop a technique chart that provides all possible timer settings used in your office for dental x-ray exams. This chart should be posted. The DEEP has agreed that various machine operating parameters need only be measured at these settings.

Film Processing Procedures

If you use film based imaging, develop a policy for maintenance of your film processing system, developing procedures and film speed selection. You may use manufacturers recommended procedures for operation of developing systems, provided you follow them. The DEEP will look for posting of development times and temperatures, will inspect the developer system for cleanliness and choice of proper film speed. It should also be noted that unless a silver recovery system is in place with documented monthly testing, disposal of developer solutions into the sanitary sewer system is prohibited. If discharging into the sanitary sewer, a permit with the Department of Energy and Environmental Protection is required. Your biomedical waste vendor may be able to dispose of developer solutions. This must be documented. It is recommended that developer solutions not be discharged.

If you use direct digital imaging, develop a policy for quality assurance of your receptors, displays and exposure selection.

X-Ray Tube Inspection Items

The items provided here are best provided by the individual retained to survey your unit(s).

Physical layout

A drawing should be available that indicates location of each x-ray unit(s), the distances from the normal x-ray tube head to each surrounding wall, to the ceiling and to the floor. This should also include the location of the operator during x-ray procedures, and this position must be at least six feet from the x-ray head and preferably not in direct line with the x-ray beam itself. You should indicate the type of areas adjacent to your x-ray room perimeter, ceiling and floor and the times individuals may be present in these areas.

X-Ray Tube Measurements and Associated Items

The radiation professional should measure, inspect and/or calculate the following

- Exposure Switch Terminates Exposure When Released
- Stability of Dental Tube Head and Support Arms
- Physical Inspection of the X-Ray Unit
- Beam Size Compliance
- Verification of Cone Length and Adequacy
- Maximum Number of Films per Month
- Measurement of Radiation Levels In the Area With Phantom in Beam
- Documentation That Exposures to General Public are Compliant
- Documentation of Staff Exposure Compliance (if badges not is use)
- KVP Accuracy Within +/- 10% of Selected KVP
- Timer Accuracy +/- 10% of Selected Time (for techniques chart values)
- Radiation Output Reproducibility +/- 10% at Technique Chart Settings
- Beam Half Value Layer Compliant
- Are Lead Aprons/Thyroid Collars Maintained in Good Condition
- Logs or Other Documentation of Solution Changes and System Cleanings
- Oxidation in Developer Solutions
- Dark Room/Developer Cleanliness
- Dark Room Lights Functioning
- Posting/Documentation of Development Times and Temperatures
- “Caution-X-Ray” Signs posted on Doors to X-ray Rooms

In Conclusion

If you follow the guidance provided in this document it is likely that, if you are inspected by the State DEEP, you will not be issued a Notice of Violation. However, and as stated previously, equipment can malfunction at any time and if this occurs after you have evaluated and documented the items listed here, you could be issued a NOV. It is imperative that if routine maintenance, quality of images or professional surveys indicate a problem exists you should address it immediately. This is especially important if the problem could increase patient doses. You will be in a more favorable position with an inspector if you have identified and are in the process of correcting a problem. The main objective of the above requirements is to minimize doses to your patients, to you and your staff and to the general public.

The CSDA cannot recommend any specific companies or individuals who offer private services that may assist you in your compliance requirements. However, you can click on the following link which should assist you in locating what you are looking for:

<http://hps.org/aboutthesociety/affiliates/services.html>

The CSDA can't recommend any specific organization or individual to fulfill the need of having a health physicists