



**LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY  
OFFICE OF ENVIRONMENTAL COMPLIANCE  
Radiation Licensing & Registrations Section  
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**DENTAL CBCT GUIDANCE**

**Definitions**

LAC 33:XV.602 Definitions

Cone Beam Computed Tomography (CBCT)

*“a volumetric imaging modality. Volumetric data are acquired using two dimensional digital detector arrays, and a cone-shaped (instead of fan-shaped) X-ray beam that rotates around the patient. Reconstruction algorithms can be used to generate images of any desired plane.”*

Quality Assurance (QA)

*“a program, which includes quality control tests, that helps to ensure that high quality diagnostic images are consistently produced while minimizing radiation exposure.”*

The QA program covers the entire x-ray system from machine, to processor, to view box. This program will enable the facility to recognize when parameters are out of limits, which could result in poor quality images and can increase the radiation exposure to patients. Simply performing the quality control tests is not sufficient. When quality control test results exceed established operating parameters, appropriate corrective action must be taken immediately and documented.

Quality Control (QC)

*“the routine measurement of image quality and the performance of the diagnostic X-ray imaging system, from X-ray beam output to the viewing of radiographs, and the continual adjustment of that performance to an optimal and consistent level.”*

These procedures and tests enable a facility to recognize when established standards have been exceeded. When QC tests are not within established standards, it may result in poor quality images and may increase the radiation exposure to patients. Simply performing the quality control tests will not result in any useful information if the data is not evaluated. Whenever quality control test results exceed established operating parameters, corrective action is required immediately.

## **Requirements**

### **Shielding Plans:**

The floor plans and equipment arrangement for all new, or modifications of existing, installations for veterinary and dental CBCT X-ray systems shall be reviewed for adequacy by the department on a case-by-case basis.

Contact the Radiation Licensing Section at (225)219-3041 to speak to someone concerning the need for shielding reviews for the room housing of the CBCT.

Even if shielding is not required, the registrant must restrict access in open areas during exposures.

### **Training:**

An individual who has been specifically trained in its operation shall only operate the CBCT X-ray system.

LAC 33:XV.603.A.3 The qualified expert, if required in this Section, shall complete initial and routine compliance evaluations following nationally recognized procedures. These evaluations shall include a review of the required quality control tests.

A medical physicist, qualified expert or trained service technician can perform the QC tests for computed tomography. The dentist may train the licensed dental radiologic technologist to perform the daily testing on the CBCT equipment.

This assumes that the registrant has been trained by the manufacture, is competent in the particular procedure and is able to convey this knowledge adequately to personnel. Product manufacturers, vendors, and service companies have websites for training. Companies whose sole purpose is training, as well as service and repair companies and the facility's medical physicist, can provide seminars and training courses ranging from a few hours to several days or more on the "how to" perform Quality Control tests. Adequate training of personnel will ensure that the tests are performed correctly and consistently

### **Quality Assurance/Quality Control:**

#### Quality Assurance

The registrant shall establish and maintain a quality assurance (QA) program. A performance evaluation shall be performed by, or under the general supervision of, a qualified expert. The evaluation shall follow nationally recognized standards and tolerances. The evaluation shall be performed within 30 days of the initial installation, at 12 month intervals but not to exceed 14 months, and within 30 days after any change or replacement of components which, in the opinion of the qualified expert, could cause a change in the radiation output or image quality. The facility shall maintain documentation of the established standards and tolerances and testing results.

**The registrant shall follow the quality control recommendations provided by the CBCT manufacturer.** In the absence of manufacturer provided quality control recommendations, the registrant shall implement and document quality control guidelines established by the qualified expert in accordance with nationally recognized guidelines.

#### **The following information shall be readily available to the CBCT operator:**

- instructions on performing routine quality control, including

- the use of the CBCT phantom(s)
- a schedule of routine quality control appropriate for the system
- allowable variations set by the qualified expert, if required, for the indicated parameters, and
- the results of at least the most recent routine quality control completed on the system.

***Exemption. A qualified expert performance evaluation on CBCT systems capable of operating at no greater than 100 kV or 20 mA shall be performed at intervals not to exceed 24 months, or an interval approved by the department.***

**Alternative Quality Assurance Program:**

In lieu of the manufacture's QA program, the registrant may establish their own program. To be approved, an alternative quality assurance program must be shown to be equally effective in achieving consistent high quality imaging while reducing unnecessary radiation to patients and workers. Persons wishing to apply for approval for an Alternative Quality Assurance Program must write to the Department and submit a request for approval for the Alternative Quality Assurance Program. No Alternative Program may be implemented until the Department has granted approval. If approved, the facility must include the alternative procedures and forms in their manual.