Northern Territory Government

DEPARTMENT OF HEALTH

RADIATION PROTECTION

GUIDELINE ON SHIELDING DESIGN FOR NEW OR OLD MEDICAL FACILITIES

March 2011

Disclaimer

This document has been prepared in good faith for general information. No warranty, either express or to be implied, is given in relation to the relevance, accuracy, completeness or fitness for purpose of the information in this document.

Users of this document should satisfy themselves concerning its application to <topic> and where necessary seek expert advice about their situation. The Northern Territory of Australia shall not be liable to any person for any loss or damage caused or alleged to have been caused directly or indirectly as a result of reliance upon this publication.

Copyright

Enquiries

General enquiries about this publication should be directed to:

Manager Radiation Protection
Department of Health
PO Box 40596
CASUARINA NT 0811

Phone: (08) 8922 7152

Fax: (08) 8922 7334

Email: envirohealth@nt.gov.au

An electronic version of this document is available at www.nt.gov.au/health/radiationprotection.

Document Control		
Version Number	**Date**	**Status**
Version 1	February 2011	Draft
Version 2	March 2011	Final

Title:	**Environmental Health: Guideline on Shielding Design for New or Old Medical Facilities**		
Type	Guideline	**Approved by**	Xavier Schobben
Division	Health Protection	**Branch**	Environmental Health
Author	Russell Robinson	**Position**	Director

Table of Contents

1. Introduction

The Northern Territory has a simple model for radiation shielding design for medical facilities. Only authoritative and well established methods may be used to calculate the required thickness of shielding in walls and panels. Appropriate outcomes must be achieved because duty of care of the operator is not reduced because of this guideline.

1.1 Target Audience

It is recommended that a current occupier of a radiation place read this document. For a proposed facility, the intended occupier should read this document.

1.2 Purpose

After reading this document, an occupier of a radiation place will be familiar with the need to obtain a certificate of compliance for the radiation place. This certificate must be issued every three years or when shielding at a radiation place is changed.

Certificate of compliance, for a radiation place, means a certificate of compliance issued under section 20 of the *Radiation Protection Act* by the holder of a certificate of accreditation authorised to issue it for the source or place.

Radiation place means a place at which a radiation source is used or is to be used to carry out a radiation practice.

Radiation protection plan is an application for a licence to possess a radiation source and acts as the principal licence for a practice.

Qualified expert is a holder of a certificate of accreditation under the *Radiation Protection Act.*

1.3 Key aligned documents

Northern Territory Code of Practice called *Certificate of Compliance for a Radiation Place.*

1.4 Key Legislation, Acts and Standards

Radiation Protection Act and Radiation Protection Regulations

2. Northern Territory Model

The occupier of a radiation place is required to contact Manager Radiation Protection to advise that new work is planned. It may be appropriate for an inspection of the proposed facility before any work is undertaken. Contact details are as follows...

Manager Radiation Protection
2nd Floor, Casuarina Plaza
258 Trower Road
Casuarina NT

PO Box 40596
Casuarina NT 0811

Ph: (08) 8922 7152
Fax: (08) 8922 7334

A qualified expert must determine appropriate shielding using design goals that are specified in the Northern Territory *Code of Practice called Certificate of Compliance for a Radiation Place*. This code is available, on the internet, at the following location: www.nt.gov.au/health/radiationprotection.

3. Design Goals

New and modified facilities are to be designed with goals in accordance with ambient dose equivalent rates of the following:

- less than 0.1 mSv per week (fraction of 5 mSv per year) for controlled areas
- less than 0.02 mSv per week (fraction of 1 mSv per year) for uncontrolled areas
- less than 0.1 mSv for radiographic film storage for a period of about one month
- less than 0.5 µSv for film stored in cassettes for a period less than 1 week.

In writing this guideline, reference was made to the National Council of Radiation Protection and Measurements (NCRP) that has produced the document NCRP 147 – *Structural Shielding Design for Medical X-ray Imaging Facilities (2004)*.

A third party, who holds a certificate of accreditation, must provide a certificate of compliance for the radiation place. This means that the shielding design is appropriate. The holder of a certificate of accreditation must be a suitable person for this purpose and this certificate is restricted according to suitability.

A list of holders of a certificate of accreditation is available. Only appropriate methods may be used for the calculations for shielding and radiation dose must be limited according to the *National Standard for Limiting Occupational Exposure to Ionizing Radiation (1995)* and the current version of the *National Directory for Radiation Protection*.

The operator may provide proof of third party assessment through the submission of calculations or diagrams, appropriately. The supplied information may be assessed and recommendations provided to the operator. The responsibility for the inadequacy of any shielding remains with the operator because the Northern Territory does not approve these assessments or issue certificates of compliance for shielding-design. This is the responsibility of the holder of a certificate of accreditation.

Please note that personal monitoring is required following any change to shielding design. Personal monitoring may be a requirement of an approved code of practice or guideline.

The application to register a new radiation place or re-register an existing radiation place must be made at the same time as an application for a licence to possess the radiation source. This latter application is called radiation protection plan. A current certificate of compliance for the radiation place must be enclosed with these applications. A fee for each application is required and is currently $100 each.

4. Chiropractic and Dental Practices

Similar design goals may be used to calculate required shielding of walls and panels in both chiropractic and dental practices. A certificate of compliance for the radiation place must then be issued by a holder of a certificate of accreditation.

5. Detection of Non-compliance

Inspections of premises are planned that will detect non-compliance that is not in accordance with the *National Standard for Limiting Occupational Exposure to Ionizing Radiation (1995)* and the current edition of the *National Directory for Radiation Protection*.

The responsibility for adequate shielding design resides with the operator. If the outcome from this design is that radiation dose is in accordance with these documents, then appropriate radiation protection goals are met.

It is recommended that these design goals are included in the application for the principal licence holder as risk constraints for the practice. Risk constraints may be included in Section 13 of this radiation-protection-plan application.