

Ministry of the Solicitor GeneralPublic Safety Division
Public Safety Training Division25 Grosvenor St.
12th Floor
Toronto ON M7A 2H3Telephone: (416) 314-3377
Facsimile: (416) 314-4037**Ministère du Solliciteur général**Division de la sécurité publique
Division de la formation en matière
de sécurité publique25 rue Grosvenor
12^e étage
Toronto ON M7A 2H3Téléphone: (416) 314-3377
Télécopieur: (416) 314-4037

MEMORANDUM TO: All Chiefs of Police and
Commissioner Thomas Carrique
Chairs, Police Services Boards

FROM: Stephen Waldie
Assistant Deputy Minister
Public Safety Division and Public Safety Training Division

SUBJECT: **Revised Guidance Note on X-ray Equipment Used in Policing**

DATE OF ISSUE:	August 2, 2019
CLASSIFICATION:	General Information
RETENTION:	Indefinite
INDEX NO.:	19-0056
PRIORITY:	Normal

At the request of the Ministry of Labour, I am sharing a communication regarding a revision to *Guidance Note #10: Health and Safety Requirements for X-ray Equipment Used in Policing*, as made by the Ontario Police Health and Safety Committee (OPHSC).

For further details, please review the memo from Assistant Deputy Minister Peter Augruso and the OPHSC Guidance Note, both attached.

Sincerely,

A handwritten signature in black ink, appearing to read "Waldie".

Stephen Waldie
Assistant Deputy Minister
Public Safety Division and Public Safety Training Division

Attachments

Memorandum



July 2019

To: Stephen Waldie
Assistant Deputy Minister, Public Safety Division
Ministry of the Solicitor General

From: Ontario Police Health and Safety Committee
Labour and Management Co-Chairs

Re: *Guidance Note (GN) #10: Health and Safety Requirements for X-ray Equipment Used in Policing - revised*

The Ontario Police Health and Safety Committee (OPHSC) is appointed by the Minister of Labour under Section 21 of the *Occupational Health and Safety Act* for the purpose of advising the Minister of Labour and making recommendations on occupational health and safety issues that affect police personnel across Ontario.

As you know, police personnel face unique occupational health and safety hazards that may not specifically be addressed in Ontario's *Police Services Act*, its regulations, or in supporting policing guidelines.

The OPHSC has revised *Guidance Note (GN) #10: Health and Safety Requirements for X-ray Equipment Used in Policing* to include information on the use of body-scanners. The guidance note includes information on the *X-ray Safety (Regulation 861)* requirements under Ontario's *Occupational Health and Safety Act (OHSA)*.

The OPHSC is seeking your support in ensuring this guidance note is distributed broadly within the policing community.

Sincerely,

A handwritten signature in black ink, appearing to read 'Mark Baxter'.

Mark Baxter
Labour Co-Chair
Police Association of Ontario

A handwritten signature in blue ink, appearing to read 'Bryan Larkin'.

Bryan Larkin
Management Co-Chair
Ontario Association of Chiefs of Police

Ministry of Labour

Office of the
Assistant Deputy Minister
Operations Division

400 University Ave.
14th Floor
Toronto, Ontario
M7A 1T7

Telephone: (416) 326-7667
Fax: (416) 212-4455

Ministère du Travail

Bureau du
sous-ministre adjoint
Division des opérations

400, avenue University
14^e étage
Toronto (Ontario)
M7A 1T7

Téléphone : (416) 326-7667
Télécopieur : (416) 212-4455



DATE:

July 24, 2019

MEMORANDUM TO:

Stephen Waldie
Assistant Deputy Minister, Public Safety Division
Ministry of the Solicitor General

FROM:

Peter Augruso
Assistant Deputy Minister, Operations Division
Ministry of Labour

SUBJECT:

**Revised Police Section 21 Committee Guidance Note
GN #10: Health and Safety Requirements for X-ray Equipment
Used in Policing**

The Ontario Police Health and Safety Committee (OPHSC) is appointed by the Minister of Labour under Section 21 of the Occupational Health and Safety Act for the purpose of advising the Minister and making recommendations on occupational health and safety issues that affect police personnel across Ontario.

The OPHSC has revised *Guidance Note #10: Health and Safety Requirements for X-ray Equipment Used in Policing* to address a variety of portable or fixed types of X-ray equipment used by municipal and provincial police personnel, e.g. X-ray body scanners, portable bomb detection machines and security baggage scanners.

The Ministry of Labour is seeking the continued support of SOLGEN in raising awareness of health and safety issues by distributing the attached guidance notes to police personnel at all levels within the policing community.

Yours sincerely,

A handwritten signature in blue ink that reads "Peter Augruso".

Peter Augruso
Assistant Deputy Minister
Operations Division
Ministry of Labour

Attachments



Ontario Police Health and Safety Committee

Guidance Note # 10

Health and Safety Requirements for X-ray Equipment used in Policing

This guidance note has been developed to provide information to employers, supervisors, workers, joint health and safety committees and health and safety representatives to raise awareness about the health and safety requirements for X-ray equipment used in policing and to protect workers from the risk of exposure to ionizing radiation.

Introduction

A variety of portable or fixed types of X-ray equipment are used by municipal and provincial police personnel, e.g. X-ray body scanners, portable bomb detection machines and security baggage scanners.

The Radiation Protection Services (RPS) at the Ministry of Labour enforces the Regulation respecting X-ray Safety (Regulation 861) under *Ontario's Occupational Health and Safety Act* (OHSa) that sets out specific requirements where X-ray machines or certain X-ray sources are present or used.

In Regulation 861 an "X-ray worker" is defined as a worker who, as a necessary part of the worker's employment may be exposed to X-rays and may receive a dose greater than the limit set out in the regulation. Operators of bomb detection X-ray machines meet the definition of an "X-ray worker". Operators of X-ray baggage inspection security machines generally do not meet the definition of an "X-ray worker" because this type of X-ray source is typically shielded by a cabinet and as such a worker would not be exposed to radiation that exceeds the limit. Operators of X-ray body scanners generally do not meet the definition of an "X-ray worker" as the operator should operate the machine while located outside of an exclusion zone. An exclusion zone is an area that must be established surrounding an X-ray body scanner where there will be exposure to radiation that exceeds the limit while the scanner is on, and which no worker (or member of the public) shall occupy while the X-ray source is on.

The Ministry of Labour considers X-rays to be a physical agent. Therefore, sections of the OHSa that refer to a physical agent apply with respect to X-rays.

Hazards associated with exposure to X-rays include cancer induction, genetic damage, tissue damage and developmental defects in an irradiated embryo or fetus. As with all workplace hazards, there are specific duties assigned to the employer, the supervisor and the worker.

Duties and Responsibilities of an Employer under the *Occupational Health and Safety Act*

Please Note: These are not exhaustive lists. Workplace parties should refer to the OHS Act and its regulations, including but not limited to Regulation 861, to ascertain their legal rights and obligations.

- Acquaint a worker or a person in authority over a worker with any hazard in the work and in the handling, storage, use, disposal and transport of any article, device, equipment or a biological, chemical or physical agent (OHS Act clause 25(2)(d)).
- Accurately keep and maintain and make available to the worker affected such records of the exposure of a worker to biological, chemical or physical agents as may be prescribed (OHS Act clause 26(1)(d)). Section 12 of Regulation 861 specifically requires the employer to provide a suitable personal dosimeter to each X-ray worker, furnish to the worker a record of their radiation exposure and keep the worker's personal dosimeter record for a period of at least three years.
- Notify a Director¹ of the use or introduction into a workplace of such biological, chemical or physical agents as may be prescribed (OHS Act clause 26(1)(e)). More specifically Regulation 861 requires registration before using an x-ray source (section 5), an application to review the installation of an X-ray source (section 6) and notice when an employer comes into possession of an X-ray source that is designed and used for portable or mobile use (section 7).
- Monitor at such time or times, or at such interval or intervals the levels of biological, chemical or physical agents in a workplace and keep and post accurate records thereof as prescribed (OHS Act clause 26(1)(f)).
- Comply with a standard limiting the exposure of a worker to biological, chemical or physical agents as prescribed (OHS Act clause 26(1) (g)). Refer to sections 10, 12, 13 and 14 of Regulation 861 to ensure that the dose equivalent annual limits found in the Schedule of the Regulation are not exceeded. Not only are X-ray dose limits prescribed in the Schedule to Regulation 861, but section 10 specifies that the dose equivalent received or may be received shall be as low as reasonably achievable.

¹ When used in this X-ray Safety Guidance Note, "Director" refers to the Director of the Ministry of Labour's Occupational Health and Safety Branch, in care of the Radiation Protection Service.

Duties and Responsibilities of Workplace Parties under Regulation 861 respecting X-ray Safety

Regulation 861 respecting X-ray Safety applies to all workplace parties (owner, employer, supervisor and worker) where an X-ray source is present or used. An employer in possession of an X-ray source has specific responsibilities under OHSA and Regulation 861. "Possession" is described by the technical guide (pages R-25 to R-76 in the hard copy print version of the Regulation) as having "discretionary authority over its use". In a scenario where the employer leases or borrows an X-ray source, and the X-ray source is located at the workplace, the OHSA requires that the owner of the workplace ensure that:

- workplace facilities are provided and maintained as prescribed [subclauses 29(1)(a)(i) and (ii)];
- the workplace complies with the regulations [subclause 29(1)(a)(iii)];
- no workplace is constructed, developed, reconstructed or altered except in compliance with the OHSA and regulations [subclause 29(1)(a)(iv)]; and
- workplace drawings, plans or specifications are given to a Director of the Ministry of Labour, as prescribed [clause 29(1)(b)].

As per subsection 6(1) of Regulation 861, an X-ray source **shall not** be installed, or used in a permanent location or used regularly in one location unless an application for review together with plan location drawings of the installation, have been reviewed by the Ministry of Labour, Radiation Protection Services and are acceptable to an inspector.

The application form approved by the Ministry of Labour for the purpose of subsection 6(1) is [Application for Review of Permanent X-ray Location \(Form 2011E\)](#).

The X-ray source to which the application relates must be installed in accordance with the application and plan location drawings as accepted by the inspector.

Employer:

- Under section 4 of Regulation 861, an X-ray source **shall not** be operated for the irradiation of a worker except as permitted under the Healing Arts Radiation Protection Act (for diagnostic or therapeutic purposes).
- Under section 5 of Regulation 861, an X-ray source shall not be used at a workplace unless the employer who has possession of the X-ray source is registered (Form 2010E) with the Director¹.
- Under section 7 of Regulation 861, where an employer comes into possession of an X-ray source that is designed for portable or mobile use, and that is so used, notice thereof shall be given to the Director¹.

Complete and submit Form 2010E [Application for Registration with the Radiation Protection Service](#) to register (section 5) and/or provide notice (section 7).

- Under section 8 of Regulation 861, an employer is required to designate a person, for each X-ray source, who is competent because of knowledge, training or experience in X-ray sources and radiation safety to exercise direction over its safe operation and use. The employer must also advise the Director¹ in writing of the designated person's name.
- Under section 9 of Regulation 861, an employer must inform an X-ray worker in writing that he or she is employed as such and inform the worker of what the permitted dose limits are. Female X-ray workers must be informed of the permitted dose applicable to a pregnant X-ray worker. A sample X-ray Worker Notification letter is attached as an Appendix to this Guidance Note.
- Under section 12 of Regulation 861, an employer shall provide a suitable personal dosimeter to each X-ray worker that accurately measures the dose equivalent received.

Note: There are three dosimetry service providers approved by the Canadian Nuclear Safety Commission: Landauer Inc. (1-800-323-8830), National Dosimetry Services (1-800-261-6689) and Mirion Technologies (1-800-251-3331).

- Under subsection 15(2) of Regulation 861 (applicable to bomb detection X-ray machines) the X-ray machine shall be used by or under the direct supervision of a competent person (MOL recognizes a competent person as certified to or equivalent to a level 1 industrial radiographer under the Canadian General Standards Board. Source: page R-46 in the hard copy print version of the regulation).

Additional Employer Requirements:

- Under subsection 5(4) of Regulation 861, an employer must notify the Director¹ when the employer ceases to have possession of an X-ray source.
- Under subsections 6(7) of Regulation 861, an employer must notify the Director¹ of any change that may possibly result in an increase in the exposure of a worker to X-rays. The X-ray source must not be used unless the change has been reviewed by, and is acceptable to, an inspector.
- Under section 13 of Regulation 861, an employer must forthwith investigate and report in writing to the Director² and joint health and safety committee or health and safety representative, if any, regarding any worker receiving a dose equivalent exceeding annual limits over a three-month period.

- Under section 14 of Regulation 861, an employer must immediately notify the Director and joint health and safety committee or health and safety representative, if any, of an accident or failure that may have resulted in a worker receiving a dose equivalent exceeding annual limits.

Supervisor (unit supervisor of x-ray source operators):

(See “competent” person designated under section 8 and requirements of subsection 15(2) of Regulation 861)

- Must be competent in the use and operation of X-ray sources and in radiation safety practices, to exercise direction over the safe operation and use of an X-ray source.

Worker:

- Under subsection 12(2) of Regulation 861, an X-ray worker shall use the personal dosimeter as instructed by the employer.

Advancing a culture of health and safety together

Employers, supervisors, workers, joint health and safety committees/health and safety representatives can all work together to ensure that workers are kept safe from hazards arising from the use of X-ray equipment.

Additional Information

Regulation 861: X-ray Safety

http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_900861_e.htm

ANSI Standard N43.17-2009 - Radiation Safety for Personal Security Screening Systems Using X-rays.

[Service Ontario Forms Repository \(Form 2010 E and Form 2011E\)](#)

Ministry of Labour Radiation Protection Services Radiationprotection@ontario.ca
or call 1-888-999-3921 (toll free) or 416-235-5922.

This document should be shared with the workplace Joint Health and Safety Committee or Health and Safety Representative, incorporated into the workplace occupational policy and program and posted on the police service’s intranet.

The Public Services Health and Safety Association may be contacted for assistance in the development and implementation of an occupational health and safety program, training and specialized services: <http://www.pshsa.ca/>

For general information or to report a workplace injury, fatality or work refusal contact the Ministry of Labour Health & Safety Contact Centre toll free at 1-877-202-0008.

For additional information on the requirements under the Occupational Health and Safety Act (OHSA), refer to http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90o01_e.htm

This guidance note has been prepared to assist the workplace parties in understanding some of their obligations under the *Occupational Health and Safety Act* (OHSA) and the regulations. It is not intended to replace the OHSA or the regulations and reference should always be made to the official version of the legislation.

It is the responsibility of the workplace parties to ensure compliance with the legislation. This advisory does not constitute legal advice. If you require assistance with respect to the interpretation of the legislation and its potential application in specific circumstances, please contact your legal counsel.

While this guidance note will also be available to Ministry of Labour inspectors, they will apply and enforce the OHSA and its regulations based on the facts as they may find them in the workplace. This guidance note does not affect their enforcement discretion in any way.

APPENDIX

X-ray Worker Notification Letter
[SAMPLE]

(PRINT DOUBLE-SIDED) Name and Address of Workplace here =>

Dear _____ (worker name)

As required by section 9 of the Regulation respecting X-Ray Safety (Regulation 861) made under the *Occupational Health and Safety Act* , I hereby inform you that you are employed as an X-ray worker.

Section 10 imposes limits on the radiation exposure that you may receive as part of your employment, namely, that doses are to be as low as reasonably achievable, and that in any case, as an X-ray worker you shall not receive a dose equivalent in excess of the annual limits set out below.

Part of the Body Irradiated	Exposure Conditions & Comments	Dose Equivalent Annual Limit for X-ray workers (millisieverts)
Whole body or trunk of body	Uniform irradiation	50
Partial or non-uniform Irradiation of body	Limit applies to the effective dose equivalent defined in the Note (see over)	50
Lens of Eye	Irradiated either alone or with other organs or tissues	150
Skin	Limit applies to mean dose equivalent to the basal cell layer of the epidermis for any area of skin of 1 square centimetre or more	500
Individual organs or tissues other than lens of eye or skin	Limit on effective dose equivalent applies, with an overriding limit on the dose equivalent to the individual organ or tissue	500

(If applicable). Your employer shall take every precaution reasonable in the circumstances to ensure that the mean dose equivalent received by the abdomen of a pregnant X-ray worker does not exceed five millisieverts during the full term of the pregnancy.

Sincerely,

_____ dated _____
(name of employer or employer's rep)

(When the worker is given this letter by the employer, it is suggested that the employer retain for its files a copy of the letter signed by the worker, see below)

Your signature here indicates that you have read and understood this document and that you have received the original.

_____ dated _____
(Worker Signature)

NOTE

Effective Dose Equivalent

The “Effective Dose Equivalent” is a way to quantify a worker’s overall risk due to a radiation exposure when only part of the worker’s body is exposed.

The Effective Dose Equivalent is determined by the following formula:

$$H_E = \sum T W_T H_T$$

Where:

H_E is the Effective Dose Equivalent

T is an index for tissue type

H_T is the annual dose equivalent in tissue T

W_T is a weighting factor which has the following values:

0.25 for the gonads

0.15 for the breast

0.12 for the red bone marrow

0.12 for the lungs

0.03 for the bone surface

0.03 for the thyroid

0.06 for each of the five other organs or tissues receiving the highest dose equivalents, but excluding the skin, extremities and eye lenses. The exposure of all other remaining tissues can be neglected. When the gastro-intestinal tract is irradiated, the stomach, small intestine, upper large intestine and lower large intestine shall be considered as four separate organs.

$\sum T W_T H_T$ is the sum of the $W_T H_T$ values for all irradiated tissues which receive more than 1 millisievert in a given year

The annual limits do not include any dose equivalent received by a worker from background sources, or received as a patient undergoing medical diagnostic or therapeutic procedures (e.g. the worker must not be wearing his or her personal dosimeter when undergoing X-ray treatment as a patient).

The annual limits include any dose equivalent received by a worker, as a consequence of his or her occupation, from all sources of ionizing radiation.

EXAMPLE: (for purposes of illustration only)

An X-ray worker has taken a series of exposures over several weeks. The radiation dosimeter (worn outside the leaded apron at the neck) shows an exposure of 1.20 millisieverts. No further exposure is expected that year. Because the worker’s body was protected by the apron, this reported exposure is not a whole body dose (a measure of overall risk). One can calculate the equivalent risk to the worker from this partial exposure (only the head and neck* in this case) using the formula below.

For the purposes of this example, we will assume that no thyroid collar was worn and that investigations reveal that the X-ray collimator was defective and the neck area was exposed.

The Effective Dose Equivalent in our example would be $0.03 * 1.20 = 0.04$ millisieverts
The lenses of the eyes are treated separately with an annual limit of 150 millisieverts.