S.02-90

SIMON FRASER UNIVERSITY
University Secretariat
MEMORANDUM

To: Senate

From: Alison Watt, Director, University Secretariat

Subject: **Policy on Non-Ionizing Radiation**

Date: 19 November, 2002

FOR INFORMATION

SCAR has determined that this policy should be forwarded to Senate for information at its meeting on December 2, 2002.

B.P. Clayman
J.-C. Brodovitch

Attachment

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SIMON FRASER UNIVERSITY

OFFICE OF THE VICE-PRESIDENT, RESEARCH

Memorandum

TO: Ms. Alison J. Watt, Director
University Secretariat

FROM: Bruce P. Clayman
Vice-President, Research

SUBJECT: Proposed Policy R20.05

DATE: 22 October, 2002

Re: Proposed SFU Policy R 20.05 - NON-IONIZING RADIATION SAFETY

I am pleased to recommend approval of this proposed policy, a copy of which is attached.

A new policy in this area is required since clear lines of authority from the SFU Board of Governors for implementing safety measures in this area are needed to comply with WCB and other regulations. Radiation Safety Policy (R20.04) - to which there is reference in R20.05 - does not cover non-ionizing radiation and there are sufficient differences that an expansion of R20.04 did not prove adequate.

The policy has been through two previous drafts and has been sent to all employee groups and all affected offices for comment. Comments were received and incorporated into this third draft.

Please note that the attached Laser Safety Manual is not part of the Policy *per se* and will be completed once the Policy is approved. At this point, it is in outline form.

I would be pleased to provide any further information that may be required.

Bruce Clayman

Attach.

c. J-C Brodovitch

2.

(DRAFT 3 OCTOBER 20, 2002)

Proposed Simon Fraser University Policy R 20.05
NON-IONIZING RADIATION SAFETY

1. PURPOSE

The use of non-ionizing radiation (NIR) occurs in a number of research, teaching, learning and work activities at Simon Fraser University. There are risks associated with exposure to NIR and the University is committed to minimizing these risks and providing a safe research, teaching, learning and work environment. The purpose of this document is to establish terms of reference for the installation, operation and maintenance of equipment emitting NIR. It is designed to:

a) protect University personnel and the general public from hazards associated with the use of equipment emitting NIR within the University context;
b) comply with the Workers' Compensation Board (WCB) requirements and regulations, and other standards and safety codes that apply to the use of NIR;
c) indicate the units within the University having the responsibility ensuring that these goals are achieved.

2. DEFINITIONS

Non-ionizing radiation (NIR) is defined as any form of electromagnetic radiation not covered by Policy R20.04 – Radiological Safety; for practical purposes this comprises the electromagnetic radiation spectrum from radio frequencies through microwaves to visible and ultra-violet light.

University is defined as locations on or away from the campuses of Simon Fraser University where personnel associated with Simon Fraser University use NIR for teaching, research or other activities related to their association with Simon Fraser University.

Supervisor is defined as the person responsible for a project using equipment emitting non-ionizing radiation.

User is defined as a person who works with equipment emitting NIR and reports to a supervisor.

3. APPLICABILITY AND SCOPE

This Policy applies to all personnel at Simon Fraser University who work with equipment emitting NIR, including but not limited to faculty members, students, research associates, and staff members, and to personnel and to the general public who may be exposed to NIR resulting from this equipment. The scope of this Policy does not include radiation from the sun and does not apply to exposure to NIR from consumer products used outside the requirements of the workplace and beyond the control of the University.

4. ROLES AND RESPONSIBILITIES

The recognized and documented hazards associated with exposure to NIR vary enormously depending on the type of NIR, from insignificant hazard (low power, low frequency radio waves) to extreme hazards (high power lasers). This Policy applies to the full range and the term "NIR safety" will be used throughout to cover safety issues. NIR safety is the responsibility of the University Radiological Safety Committee (URSC) and the NIR Safety Officer (NRSO).

4.1 NIR SAFETY

The URSC is responsible for the overall supervision, review and audit of the NIR safety program at Simon Fraser University. The NRSO operates under authority delegated by the URSC and is responsible for the day-to-day administration of NIR safety.

The URSC and the NRSO develop and implement an NIR safety program at Simon Fraser University. The purpose of the program is to monitor both teaching and research facility design, procedures and equipment, and to implement and enforce the policies, regulations and procedures for the control and safe use of all lasers. The details of this program that are specific to lasers are described in the SFU Laser Safety Manual.

4.1.1 University Radiological Safety Committee (URSC)

The responsibility to implement and enforce the NIR safety program rests with the University Radiological Safety Committee. The URSC derives its authority from the Simon Fraser University Board of Governors, through the Office of the Vice-President, Research. Policy - R20.04 Radiological Safety - specifies the composition of the URSC. In the context of NIR safety, there will be one member representing NIR users and the NRSO, who will sit as an *ex officio* non-voting member of the URSC (see below for details of the appointment of the NRSO).

With respect to NIR safety, the URSC has a mandate to:

a) Supervise the development of a NIR safety program and to ensure that the installation, operation and maintenance of NIR sources are performed accordingly, regardless of the source of authorization at the University;
b) Review annually, the NIR safety program to determine if all activities meet the conditions of the WCB and other recommended safety codes and regulations;
c) Receive reports from the NRSO and recommend remedial action to correct any deficiencies;
d) Review actions taken by the NRSO for non-compliance with regulations and procedures;
e) In general, act as the internal auditor of the functioning of the NIR safety program at Simon Fraser University;
f) Ensure that changes to the SFU NIR Safety Manual are consistent with this Policy, and monitor the implementation of these changes;
g) Recommend changes to this Policy to the Vice President, Research.

4.1.2 NIR Safety Officer (NRSO)

4.1.2.1 Appointment

An individual shall be designated the NIR Safety Officer (NRSO) with the authority and responsibility to monitor and enforce the control of NIR hazards. The NRSO shall have working knowledge of NIR including laser systems.

The NRSO is appointed by the Vice-President, Research upon the recommendation of the URSC. The NRSO reports to the Director of Radiation Safety (DRS). The NRSO sits as an *ex officio*, non-voting member of the URSC. Depending on the extent and number of NIR installations, the NRSO may be a full-time or part-time employee or the NRSO functions may be assigned as part of the responsibilities of a full-time employee. The NRSO shall not be a person whose activities are subject to the approval of the URSC or NRSO.

4.1.2.2 Role and Responsibilities

The NRSO represents the executive body of the URSC and is responsible for the day-to-day implementation of the NIR safety regulations and procedures. In particular, the NRSO has the responsibility to:

a) Advise the URSC on matters regarding NIR safety;
b) Advise the Vice-President, Research on matters related to NIR hazards and NIR safety, including the resources necessary to set up and maintain an adequate NIR safety program;
c) Be available for consultation on problems dealing with NIR sources and potential hazards of such equipment.
d) Develop, update, recommend and implement policies and procedures for the safe use of lasers and other NIR-emitting equipment in accordance with the current WCB guidelines and those of other pertinent regulatory agencies and safety codes;
e) Maintain an inventory of laser and other NIR-emitting equipment at SFU;
f) Classify or verify the classifications of lasers and laser systems used at SFU;
g) Review and approve specific operating procedures for each application for use of lasers; these shall be consistent with the requirements of SFU NIR safety policies and procedures;

h) Evaluate potential hazards of laser work areas, including the establishment of Nominal Hazard Zones (NHZ);
i) Ensure that prescribed control measures are in effect and recommend alternatives where necessary; perform periodic audits of the functionality of these control measures;
j) Approve laser installation facilities and laser equipment prior to use; approve modification of existing facilities and equipment;
k) Approve standard operating procedures, laser alignment procedures, and other procedures that may be necessary for administrative and procedural control measures;
l) Approve area warning signs and equipment labels;
m) Ensure that education and training is provided in accordance with ANSI standards;
n) Determine personnel categories for medical surveillance in accordance with ANSI standards;
o) Ensure that the appropriate records are maintained regarding training and medical examinations where applicable;
p) Investigate accidents and incidents and initiate appropriate action;
q) Review at least annually the SFU Laser Safety Manual and revise it as needed;
r) Prepare and submit an annual report of his/her activity to the URSC;
s) Sit as an *ex officio*, non-voting member of the University Radiological Safety Committee.

4.1.2.3 Resources

The Vice-President, Research shall ensure that the NRSO receives appropriate training and resources to conduct the NIR safety program, either directly or through arrangement with relevant Departments.

4.1.3 Responsibilities of Supervisors

The supervisor is an employee of the University with proven training and/or experience acceptable to the URSC in the safe handling of NIR sources. The responsibilities of the supervisor are to:

a) Notify the NRSO that he/she possesses a NIR source;
b) Notify the NRSO about any changes to the status of his/her NIR equipment that may affect the safety of its operation;
c) Develop operating procedures specific to the NIR equipment under his/her control that are acceptable to the NRSO;
d) Ensure that safe laboratory practices are followed in compliance with the SFU NIR safety policies and procedures and the specific operating procedures;
e) Ensure that all personnel (Users) under his/her supervision are properly trained to work safely near, and/or operate safely, NIR sources and associated equipment.

4.1.4 Responsibilities of Users

The individuals who have been trained to operate an NIR source must:

a) Be familiar with the SFU NIR safety policies and procedures;
b) Follow specific operating procedures;
c) Report promptly to the Supervisor and the NRSO any unsafe incidents or accidents involving the use of NIR sources;
d) Bring to the attention of the Supervisor any defect or potentially unsafe situation in the operation of NIR sources or related equipment.

5. INTERPRETATION

Questions of interpretation or application of this Policy or its procedures shall be referred to the President, whose decision shall be final.

(DRAFT 3 OCTOBER 20, 2002)

Simon Fraser University

Laser Safety Manual

Policy R20.05 is the Non-Ionizing Radiation (NIR) Safety Policy at Simon Fraser University. Lasers emit a form of NIR and this manual complements Policy R20.05 by presenting details of various administrative and operational procedures associated with laser safety.

1. General

The procedures described in this manual are adapted from the American National Standard for Safe Use of Lasers (document ANSI Z136.1-1993) as recommended by the Workers' Compensation Board (WCB).

If any procedures and/or recommendations for the safe use of lasers presented in this manual are in conflict with WCB regulations and recommended standards, the WCB regulations shall prevail.

1.1 University Radiological Safety Committee (URSC)

The URSC composition and mandate are defined in Policy 20.04. One member shall represent NIR users. This individual can be a regular member of the URSC or can be an additional member from one of the SFU Departments most likely to have laser equipment (typically: Chemistry, Engineering Science or Physics). The NIR representative is appointed by the Vice-President, Research upon nomination by the Chairs of the concerned Departments. The term of appointment will be two years with unlimited renewal possible.

1.2 Non-Ionizing Radiation Safety Officer (NRSO)

The NIR Safety Officer (NRSO) has the authority and responsibility to monitor and enforce the control of laser hazards.

The NRSO is appointed by the Vice-President, Research upon the recommendation of the URSC. The NRSO reports to the Director of Radiation Safety (DRS). The NRSO sits as an ex officio, non-voting member of the URSC. Depending on the extent and number of NIR installations, the NRSO may be a full-time or part-time employee or the NRSO functions may be assigned as part of the responsibilities of a full-time employee. The NRSO shall not be a person whose activities are subject to the approval of the URSC or NRSO.

1.2.1 Qualifications and Duties

The qualifications and duties of the NRSO are specified in Policy R20.05.

2. Hazard Evaluation and Classification

See ANSI Z136.1-1993, section 3.

2.1 General

2.2 Laser Considerations

2.2.1 Multi-wavelength Lasers

2.2.2 Repetitively Pulsed Lasers

2.2.3 Parameters determining Laser Hazard Classification

2.3 Laser and Hazard classification

2.3.1 Class 1 Lasers

2.3.2 Class 2a and Class 2 Lasers

2.3.3 Class 3a and Class 3b Lasers

2.3.4 Class 4 Lasers

2.4 Environment in which Laser is used

2.4.1 Nominal Hazards Zones (NHZ)

2.4.2 Indoor operations

2.4.3 Outdoor operations

2.5 Personnel

3. Control Measures

Table 1 presents guideline for measures appropriate to the laser classification. See ANSI Z136.1-1993, section 4.

Table 1.

Laser class	Control Measures
1	Not applicable
2	Applicable
2a	Applicable
3a	Applicable
3b	Applicable
4	Applicable

3.1 General considerations

3.1.1 Applicability

3.1.2 Case of Class 3b or Class 4

3.1.3 Laser for health care use

3.1.4 Associated hazards

3.2 NIR Safety Officer (NRSO)

3.3 Engineering Control

3.3.1 Protective housings

3.3.2 Interlocks

3.3.3 Service access

3.3.4 Key control

3.3.5 Viewing screens and optics

3.3.6 Beam paths

3.3.7 Remote interlock

3.3.8 Beam stop or attenuator

3.3.9 Warning systems

3.3.10 Indoor control area

3.3.11 Outdoor control measures

3.3.12 Temporary controlled area

3.3.13 Remote control

3.3.14 Labels

3.3.15 Postings

3.4 Procedures

5. Medical Surveillance

Table 2 presents guidelines for medical surveillance appropriate to the laser classification. See ANSI Z136.1-1993, section 6.

Table 2.

Laser class	Medical Surveillance
1	Not applicable
2	Not applicable
2a	Not applicable
3a	Not applicable
3b	Applicable
4	Applicable

5.1 General

5.2 Personnel Categories

5.3 General Procedures

5.4 Frequency of Medical Examinations