

National Institutes of Health

Non-Ionizing Radiation Program

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ACRONYMS

DOHS	Division of Occupational Health and Safety
LSAC	Laser Safety Advisory Committee
LSO	Laser Safety Officer
MRI	Magnetic Resonance Imaging
NIH	National Institutes of Health
NIR	Non-Ionizing Radiation
NIRP	Non-Ionizing Radiation Program
NMR	Nuclear Magnetic Resonance
OMS	Occupational Medical Service
ORS	Office of Research Services
PI	Principal Investigator
TAB	Technical Assistance Branch

INTRODUCTION

Non-ionizing radiation (NIR) permeates the world and exists in many forms on the electromagnetic spectrum, from radio waves to near-ultraviolet radiation. Fortunately, unlike ionizing radiation, NIR lacks sufficient energy to remove electrons from atoms and molecules and is therefore generally perceived as less harmful. However, exposure to significant amounts of NIR can result in tissue damage due to heat. For this reason, considering incomplete epidemiological data, care is taken to limit exposure to NIR according to consensus guidelines. NIR includes the spectrum of Ultraviolet (UV), visible light, infrared (IR), microwave (MW), radiofrequency (RF), and extremely low frequency (ELF). Lasers fall within the UV, visible, and IR spectrums. NIR is used in a wide variety of occupational environments and can potentially cause considerable health risks if not properly controlled.

I. PURPOSE

The NIH Non-Ionizing Radiation Program (NIRP) is intended to minimize occupational exposure to NIR by:

- a) Providing employee information regarding the recognition, evaluation, and control of the hazards associated with sources of NIR.
- b) Reviewing plans for the installation of new sources of NIR.
- c) When requested, providing affected employees with information regarding source-appropriate safety principles and best practices; and
- d) Evaluating NIR levels when requested by employees or when sources are identified during safety surveys.

II. SCOPE

Sources of NIR located at NIH facilities include:

- Telecommunication and data transfer antennas.
- Microwave ovens.
- High-intensity magnets, including magnetic resonance imaging (MRI) devices, nuclear magnetic resonance (NMR) devices
- Ultraviolet lamps; and
- Alternating current electromagnetic field sources such as electrical power lines, transformers; electrical panels, and electrical appliances.

Lasers are also a significant source of NIR at NIH but are not within the scope of this program. Instead, Lasers are covered by the NIH Laser Safety Program, under the direction of the Laser Safety Officer (LSO) and Deputy LSO, as well as the Laser Safety Advisory Committee (LSAC). For more information and to view the Laser Safety Program document, visit: <https://go.usa.gov/xRQgW>.

III. RESPONSIBILITIES

The Division of Occupational Health and Safety (DOHS), Office of Research Services (ORS):

- a) The Technical Assistance Branch (TAB) is the functional group within DOHS responsible for managing the NIRP. A TAB industrial hygienist is assigned as the NIRP Manager.
- b) The NIRP Manager:
 1. Provides and facilitates the development, dissemination, and implementation of the NIRP.
 2. Provides consultative services related to the recognition, evaluation, and control of NIR hazards and maintains appropriate NIR policy and guidelines.
 3. Conducts surveys for non-ionizing radiation and if required, recommends exposure control measures.
 4. Review and update the NIR program on an annual basis.
 5. Notifies employees of their non-ionizing radiation exposure when applicable.
 6. In conjunction with the Principal Investigator (PI) or responsible official:
 - a. Ascertains whether warning devices (signs, alarms, etc.) are necessary and assists in the selection of appropriate safety control measures.
 - b. Reviews major NIR equipment purchases (except microwave ovens) and related construction plans to ensure adequate hazard control.
 7. Investigate accidents resulting from NIR operations.
 8. Ensures appropriate corrective actions are taken to prevent employee exposures exceeding recommended occupational levels; and
 9. Maintains an inventory of significant non-ionizing radiation sources.

The Occupational Medical Service (OMS):

The OMS provides medical consultation to employees for any incidents involving exposure to elevated levels of NIR.

The Division Directors, Managers, Supervisors, and Principal Investigators:

- a) Identifies and reports NIR sources to the NIRP Manager.
- b) Assists the NIRP Manager in identifying employees who may be at risk of over-exposure to NIR.
- c) Requests NIRP Manager evaluation of employee NIR exposure.
- d) Ensures maintenance and repair work on or around NIR equipment are performed safely by qualified and trained individuals.
- e) Maintains and informs employees of NIH NIRP policies; and as directed by the NIRP Manager, Occupational Safety and Health Administration regulations.
- f) Provides adequate instruction and training on the proper and safe use of NIR equipment to potentially affected personnel.

- g) Prohibits the operation of NIR equipment without adequate hazard control(s);
- h) Takes appropriate corrective actions to ensure NIR equipment is operating within the manufacturer's parameters.
- i) Notifies the NIRP Manager when an adverse incident resulting from the use of NIR has occurred or is suspected of having occurred; and
- j) Prohibits the modification of NIR equipment or system(s), without prior consultation with the NIRP Manager to avoid the introduction of additional safety hazards.

The NIR Equipment or System(s) Operators and Personnel Working Around NIR:

- a) Follows personnel protection measures related to NIR exposures.
- b) Energizes a NIR system or works with or near a NIR system only when authorized by the responsible PI or the responsible official.
- c) Obtains appropriate training on the procedures and policies related to the safe operation of NIR equipment.
- d) Immediately informs the PI and or immediate supervisor and OMS upon suspicion or knowledge that an exposure exceeding safe occupational levels has occurred; and
- e) Immediately reports to OMS for any work-related injuries/illnesses and health concerns.

IV. REPORTING REQUIREMENTS

- a) NIH employees and contractors must notify the NIRP Manager when a potentially hazardous NIR source is used at NIH facilities.
- b) If NIR equipment or system(s) are modified such that the hazards are substantially increased, the NIRP Manager shall be contacted to evaluate the new modifications to ensure that appropriate safety controls are incorporated into the modified system.

V. APPENDICES

Appendix A: Non-Ionizing Radiation Signage: [UV Light Sign](#).

