DEPARTMENT OF THE NAVY
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IN REPLY REFER TO
BUMEDINST 6470.23A
BUMED-N3
10 Jan 2023

BUMED INSTRUCTION 6470.23A

From: Chief, Bureau of Medicine and Surgery

Subj: OPERATIONAL NON-IONIZING RADIATION HEALTH PROTECTION

Ref: (a) DHA memo of 11 Aug 2021 (NOTAL)
(b) OPNAVINST 5100.23
(c) OPNAVINST 5100.27B/MCO 5104.1C
(d) DoD Manual 6055.05, Occupational Medical Examinations: Medical Surveillance and Medical Qualification, 31 August 2018
(e) OPNAVINST 5100.19F
(f) American National Standards Institute, ANSI Z-136.1 Series of Laser Safety Standards (NOTAL)
(g) Institute of Electrical and Electronics Engineers C95.1-2345 (NOTAL)
(h) Joint Trauma System Clinical Practice Guideline 79, Ocular Evaluation and Disposition after Suspected Laser Exposure (NOTAL)
(i) NMCPHC-TM OM 6260
(j) American National Standards Institute, ANSI/IEEE C95.1-2345-2014, Standard for Military Workplaces-Force Health Protection Regarding Personnel Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz to 300 GHz (NOTAL)
(k) DoD Instruction 6055.07 of 31 August 2018
(l) DoD Instruction 6055.15 of 31 August 2018
(m) OPNAVINST 5102.1D
(n) DoD Instruction 6055.11 of 12 May 2021

Encl: (1) Laser Medical Surveillance Program
(2) Recommended Equipment and Supplies for Evaluating Laser Beam Exposure
(3) Laser Incident Questionnaire
(4) Laser Overexposure Incident Actions
(5) Radiofrequency Surveillance Program
(6) Radiofrequency Radiation Overexposure Incident Actions
(7) Non-Ionizing Radiation Overexposure Incident Guidelines

1. Purpose. To issue medical surveillance requirements and casualty management procedures for personnel exposed to non-ionizing radiation. This revision includes updates to the medical surveillance requirements and procedures for the management of personnel overexposed to non-

ionizing radiation, and provides recommended equipment, supplies, and questionnaires for use during exposure incidents per references (a) through (n). This instruction is a complete revision and should be reviewed in its entirety.

2. Cancellation. BUMEDINST 6470.23.

3. Scope and Applicability. This instruction applies to all Department of the Navy (DON) activities using sources of non-ionizing radiation that may affect the safety or health of personnel. Personnel not employed by the DON will fully comply with this instruction when engaged in a Navy sponsored program or operation, or when visiting Navy ships, aircraft, or stations. This instruction does not apply to the exposure of individuals to non-ionizing radiation when used for the diagnosis or treatment of medical or dental conditions.

4. Background

a. Due to the propagation of lasers and radio frequencies in military applications, it is becoming more likely that one will encounter weapon and stand-off systems incorporating such technologies. Non-ionizing radiation predictably harms human health in proportion to the dose received. Non-ionizing radiation primarily causes harm by overheating, rapid expansion, or burning. Individuals working with non-ionizing radiation must be protected from overexposure and, depending on the job, may require occupational medical surveillance to ensure they have not experienced an exposure-related adverse health effect. Individuals overexposed to non-ionizing radiation require a medical evaluation (and follow-up, if necessary) focused on the specific injury possibly sustained. When a non-ionizing radiation overexposure occurs, a thorough medical evaluation of the patient and the conditions under which the overexposure occurred is required.

b. It is important for medical providers to understand the nature and impact of non-ionizing radiation on human health, its effects and how to screen and assess individuals over exposed to non-ionizing radiation. Occupational medicine physicians, Navy aerospace optometrists, and aerospace and operational physiologists are useful sources of information as they are specially trained in these areas. In the case of eye injuries, ophthalmologists may be available at level three in-theater care and are available at out-of-theater definitive care sites. Optometrists may be available at level two in-theater care, usually available at level three in-theater care, and are available at out-of-theater definitive care sites.

5. Policy

a. Commands must maintain a Laser Medical Surveillance Program (LMSP) for laser users when there is a possibility of exceeding the maximum permissible exposure (MPE) and follow the guidance in enclosure (1) to carryout the program requirements. Enclosure (2) provides a list of supplies to complete the evaluation of laser beam exposure, and enclosure (3) should be used as a tool to thoroughly investigate laser incidents. In the event of any suspected or known

overexposure to laser energy, the incident must be investigated and reported using the guidelines in enclosure (4). In the event of an anomalous health incident, it should be handled per reference (b).

b. Commands must maintain a Radiofrequency Surveillance Program when activities or operations involving recurrent overexposures to radio frequency radiation are more than five times the MPE or exposure reference level, following the guidance in enclosure (5). In the event of any suspected or known overexposure, an investigation into the causes and circumstances of the overexposure must be performed following the guidelines in enclosure (6).

c. The medical officer or senior medical provider, in conjunction with the platform industrial hygiene officer, environmental health officer, radiofrequency safety officer, and laser safety officer, will familiarize themselves with the guidelines in enclosure (7) and should actively participate in education sessions designed to teach pertinent crew members about non-ionizing radiation's effects and the personal protective equipment available.

6. Records Management

a. Records created as a result of this instruction, regardless of format or media, must be maintained and dispositioned per the records disposition schedules located on the DON Directorate for Administration, Logistics, and Operations, Directives and Records Management Division portal page at https://portal.secnav.navy.mil/orgs/DUSNM/DONAA/DRM/Records-and-Information-Management/Approved%20Record%20Schedules/Forms/AllItems.aspx.

b. For questions concerning the management of records related to this instruction or the records disposition schedules, please contact the local records manager or the DON Directorate for Administration, Logistics, and Operations, Directives and Records Management Division program office.

7. Review and Effective Date. Per OPNAVINST 5215.17A, Fleet Programs (BUMED-N35) will review this instruction annually to ensure applicability, currency, and consistency with Federal, Department of Defense, Secretary of the Navy, and Navy policy and statutory authority using OPNAV 5215/40 Review of Instruction. This instruction will be in effect for 10 years, unless revised or cancelled in the interim, and will be reissued by the 10-year anniversary date if it is still required, unless it meets one of the exceptions in OPNAVINST 5215.17A, paragraph 9. Otherwise, if the instruction is no longer required, it will be processed for cancellation as soon as the need for cancellation is known following the guidance in OPNAV Manual 5215.1 of May 2016.

8. Forms and Information Management Control

a. Forms. In the event of an over exposure to non-ionizing radiation, copies of electromagnetic frequency overexposure medical forms are available via a common access card (CAC) accessible Web site, https://hpws.afrl.af.mil/dhp/OE/ESOHSC.

b. Information Management Control. The reports required in enclosure (4), subparagraph 1a and paragraphs 3 and 4 and enclosure (7) paragraph 1 of this instruction are exempt from reports control, per Secretary of the Navy Manual 5214.1 of December 2005, part IV, subparagraph 7k.

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Releaseability and distribution:
This instruction is cleared for public release and is available electronically only via Navy Medicine Web site, https://www.med.navy.mil/Directives

LASER MEDICAL SURVEILLANCE PROGRAM

1. Laser safety officers (LSO) require training per reference (c). Certification is required along with an endorsement from the commanding officer to be appointed as LSO.

2. The LMSP limits enrollment to those personnel who are recognizably at risk from overexposure to laser radiation. The unit LSO and medical officer or senior medical provider will determine personnel enrollment in the LMSP based upon the probability of overexposure to laser radiation. Individuals routinely working with class 3B or class 4 lasers with a high probability of overexposure to laser radiation will require medical surveillance. Examples of personnel requiring enrollment in a LMSP include:

a. Research, development, and laboratory personnel routinely working with unenclosed class 3B or 4 laser systems.

b. Maintenance personnel who routinely repair, align, or boresight exposed or open class 3B or 4 laser systems.

c. Operators and down-range personnel who routinely work with class 3B or 4 engineering laser transits, geodimeters, and alignment laser devices.

d. Operators who routinely work with class 3B and 4 industrial lasers where access to an energized systems laser hazard zone is possible.

e. Personnel who routinely work with class 3B and 4 lasers for target designation or aiming purposes or both on crew-served and personnel carried laser system weapons.

3. While a LMSP is required per references (d) and (e), medical surveillance is not necessarily required for some laser users when it is possible but unlikely, for them to exceed the maximum permissible exposure, per reference (f) (available via subscription at Web site, https://www.lia.org/store/product/ansi-z1361-2014-safe-use-lasers-electronic-version).

4. There are three types of examinations for the LMSP: baseline, situational, and termination laser examinations. LMSP examinations will clearly state the type and purpose of medical examination.

a. Baseline examinations are used to measure damage in the event of an injury and to identify certain workers who may be at special risk from chronic exposure to select laser systems. Conduct a baseline examination before initial assignment involving the laser radiation exposure risk. Examinations for other purposes that include the required information satisfy the requisites of this instruction.

b. Periodic medical examinations are not required.

c. Situational examinations are required when an actual or suspected laser induced injury occurs. The injury should be evaluated by a medical professional as soon as possible after the exposure. Referral for medical examinations will be consistent with the medical symptoms and the anticipated biological effects based upon the laser system in use at the time of the incident. For laser-induced injury to the eye, the initial medical evaluation must be performed by a qualified medical provider with follow-up by an ophthalmologist or optometrist if indicated. Reference (g) (available via subscription at https://jts.amedd.army.mil/assets/docs/cpgs/Ocular_Evaluation_Disposition_After_Laser_Exposure_14_Feb_2020_ID79.pdf) provides up to date clinical practice guidelines for ocular evaluations following suspected laser eye exposure. Skin injuries should be evaluated by a medical provider as soon as practicable.

d. Termination examinations provide evidence and documentation of retinal health and any ocular damage that an employee may have when they exit the LMSP. Photo-documentation should be performed for retinal health at the time of the examination. Termination examinations will be administered after the Service member or employee has been permanently excused from duties requiring inclusion in the LMSP. When constrained by ship operations or deployment, perform the examination as soon as possible.

e. For personnel who have been removed from the laser surveillance program with a termination exam and have a documented reason they need to be returned to the LMSP, a new baseline examination must be performed prior to resumption of duties. A second termination exam will be administered as near as practical to the date the individual will again be terminated from duties requiring inclusion in the LMSP.

5. LMSP examinations must include:

a. Ocular histories with special emphasis on photosensitizing medications, lens surgery, unusual sensitivity to sunlight, and skin diseases. Record current refraction prescription and the date of the most recent examination.

b. Visual acuity for far and near vision.

c. Color vision test.

d. Amsler grid or other tests of macular function for distortions or scotomas.

e. Retinal photos to document pre-existing conditions.

f. Any deviation from the acceptable norms must be evaluated to determine the reason. This may be done by ocular funduscopic examination or other tests as deemed appropriate by the eye care professional. Baseline funduscopic photography may be useful for documenting the retinal status.

g. As deemed necessary by the medical examiner, dilated, direct view ophthalmoscopic examinations of the retina and slit lamp examinations of the cornea and lens to describe any pathology or deviations from the normal. Refer any questionable ocular or retinal lesions discovered by the medical examiner to an ophthalmologist or optometrist for evaluation and photographic documentation.

h. Skin examinations are recommended for individuals with a history of photosensitivity or who are working with lasers emitting accessible ultraviolet radiation or infrared radiation within the laser system's identified skin hazard distance. A history of skin conditions, including photosensitivity, current complaints concerned with the skin, and medication usage, particularity concentrating on those drugs that are potentially photosensitizing.

i. Perform medical surveillance procedures, per reference (h). A list of recommended equipment and supplies for evaluating laser beam exposure is included as enclosure (2).

RECOMMENDED EQUIPMENT AND SUPPLIES FOR EVALUATING LASER BEAM EXPOSURE

1. Suggested Equipment. Below is a suggested list of equipment and supplies that may be useful in evaluating laser beam exposure. It is recommended that there is at least one blue or ultraviolet light source to evaluate the corneal surface with fluorescein.

Note: Establishing a memorandum of understanding with a local medical treatment facility for support with equipment and supplies may be beneficial.

a. Ultraviolet (blue) light source to evaluate corneal surface using fluorescein. This should include a penlight with detachable blue light filter, direct ophthalmoscope with blue light filter, and Wood's lamp if slit lamp is not available.

b. Fluorescein sodium ophthalmic strips.

c. Sodium fluorescein strips.

d. Artificial tears.

e. Sterile eye pads and bandage tape.

f. Proparacaine 0.5 percent.

g. Tropicamide 1 percent.

h. Phenylephrine 2.5 percent.

i. Topical ophthalmic antibiotic drops or ointment.

j. Pinhole occlude.

k. Near and far visual acuity charts.

l. Amsler grid tests.

m. Computerized color vision testing, such as the cone contrast test.

n. Pseudoisochromatic plates (armed forces color plates, ishihara, waggoner psuedoisochromatic plates (PIP24, etc.).

o. Optec vision tester.

2. Additional Equipment. The equipment listed in subparagraphs 2a through 2c is optional but would be very useful if a high number of laser beam exposure cases are anticipated.

a. Digital camera (for documenting external burns, lesions, etc.).

b. Hand-held Tonopen® and disposable tip covers.

c. Hand-held retinal camera.

LASER INCIDENT QUESTIONNAIRE

1. Laser Incident Questions. The questions listed in subparagraphs 1a through 1c are designed to gather information to assist medical, operational, and intelligence personnel in analysis of laser beam exposure incidents. It should be anticipated that further questions and information will be sought as time allows. Finally, remember to call the Tri-Service hotline at (800) 473-3549 or defense switched network (DSN) 798-3764 as soon as possible.

a. Describe the light you saw:

(1) What color(s) was the light(s)?

(2) How bright was it?

(3) How long was it on?

(4) Was it uniform in appearance?

(5) Did the intensity of the light change?

(6) Was it constant or did it pulse or flicker? If so, how fast did it pulse or flicker?

(7) How wide (perhaps using finger widths at arm's length) was the beam at origin?

(8) How wide on exposure was the light? Did the light fill your cockpit or compartment?

(9) Was the light emanating directly from a source or was it reflected off a surface?

(10) Were there any other unusual light sources?

(11) Have you seen this light(s) before?

b. Date, location, and circumstances:

(1) Date and time (local and Zulu using a 24-hour clock) the exposure occurred.

(a) Local: DDMMYYYY hh:mm.

(b) Zulu: DDMMYYYY hh:mm.

(2) Location of exposure (if unclassified), classified debriefs are available via the DoD Tri Service Laser Injury Hotline. Describe location preferably using degrees decimal (DD), degrees-minutes-seconds, universal transverse mercator, or Military Grid Reference System.

(3) How far and in what direction was the light source? Was it airborne or surface based?

(4) What was between the light source and your eyes?

(5) What were the atmospheric conditions: clear, overcast, rainy, foggy, hazy, and sunny?

(6) Was any equipment such as windscreens, visors, night vision goggles, goggles or sensors affected by the light?

(7) What evasive maneuvers did you attempt and did the beam follow you as you tried to move away?

c. Effects:

(1) How long did you look into the light beam?

(2) Did you look straight into the light beam or off to the side?

(3) What tasks were you doing when the exposure occurred? Did the light(s) hamper you from doing those tasks?

(4) Were both eyes exposed? If not, describe the difference between the light exposure (for example, one eye was shielded or closed, or on the side away from the light beam). Describe any difference in the effect on either eye.

(5) Was the light so bright that you had to blink or squint, close your eyes, or look away? Was the light painful? Describe the pain. How long did the pain persist after the light exposure?

(6) Was vision affected while the light was on? How much of your visual field was affected? What types of things could you see or not see? Did you notice the color of instruments or targets change? Did the changes to your vision remain constant or vary during the exposure? If the light source was mounted on a platform (e.g., aircraft, ground vehicle, or building) how much of the platform was obscured?

(7) Did your vision remain affected after the light was extinguished? If so, for how long and how did you estimate the time? What types of things could you see or not see? Did you notice afterimages (spots before your eyes)? If so, describe them.

(8) Was there any lingering (e.g., hours or days) visual effects? If so, were the effects continuous or intermittent? Did you have problems reading or seeing in low-light conditions? How long until you were able to see normally again?

(9) Did you notice any reddening, warming, or burns to your skin?

(10) Describe the condition of your vision before the incident. Do you wear glasses? Are you taking any medications?

LASER OVEREXPOSURE INCIDENT ACTIONS

1. In the event of any suspected or known overexposure to laser energy, immediately seek medical attention. The Service member in charge will ensure each exposed Service member receives an initial examination by a qualified medical provider.

a. Medical Examination. Personnel involved in a suspected or known laser overexposure incident must be evaluated as soon as possible to identify and treat injuries. The U.S. Air Force School of Aerospace Medicine operates the DoD Tri-Service Laser Injury Hotline, per reference (i). In the event of a suspected injury or exposure to DoD Service members from lasers, health risk consultants are available to assist with investigating and reporting incidents at (800) 473-3549 or DSN 798-3764.

b. For ocular injuries, a full retinal examination will be administered by an ophthalmologist or optometrist as soon as possible. Reference (g) provides updated clinical practice guidelines for managing suspected ocular laser exposure. If an ophthalmologist or optometrist is not immediately available, a qualified medical provider will perform a full retinal examination immediately. If no injury is apparent, personnel will be referred to an ophthalmologist or optometrist as soon as practicable for follow-up. If an injury is identified, personnel must be treated by a qualified medical provider immediately. Many lesions begin to fade or heal with time making diagnosis of injury more difficult and symptoms or physical signs of eye injury unapparent. Further, delay in evaluation may later reduce medical treatment options. Documentation of the injury requires color retinal photographs and, if available, ocular coherence tomography. If the capability for photography is unavailable, make a diagram of the eye documenting the injury and pathology. Medical providers can obtain guidance from the Tri-Service Laser Injury Hotline by calling 1-800-473-3549 or DSN 798-3764.

c. For skin injuries from shock or burns, or both, examinations should be evaluated and treated based upon the type of laser present in the individual's work environment.

d. For those whose experience to overexposures to non-ionizing radiation have accompanying behavioral health symptoms (e.g., anxiousness, fears) a referral to behavioral health may be warranted.

2. Notify appropriate safety and command personnel. The Service member in charge will make appropriate notifications to the unit laser safety officer and commander.

3. Report the laser radiation incident to the groups listed in subparagraphs 3a through 3h, as soon as practical.

a. DoD Tri-Service Laser Injury Hotline, (800) 473-3549 or DSN 798-3764 and CAC accessible Web site, https://hpws.afrl.af.mil/dhp/OE/ESOHSC/pages/index.cfm?id=870.

b. Naval Safety Command Risk Management Information (RMI) System available at Web site https://navalsafetycommand.navy.mil/Resources/RMI/ which requires a login account for access.

c. Naval Sea System Command Radiological Controls Program Office at (202) 781-1205.

d. Bureau of Medicine and Surgery Non-Ionizing Radiation Branch (BUMED-M35) for Navy commands (703) 681-9276.

e. Headquarters, U.S. Marine Corps Safety Division for Marine Corps commands (703) 604-4384.

f. Federal Aviation Administration for aviation related incidents available at Web site, https://www.faa.gov/aircraft/safety/report/laserinfo.

g. Local law enforcement for lasers emitted by an unsolicited source.

h. For incidents involving classified lasers, please contact the Environmental, Safety, and Occupational Health (ESOH) Service Center via e-mail at esoh.service.center@us.af.mil or telephone at (888) 232-3764 or DSN 798-3764 for additional reporting instructions.

4. Investigate the incident per references (l) and (m). To the maximum extent practical, complete and submit the laser injury reporting documentation from the ESOH service center using a CAC accessible Web site, https://hpws.afrl.af.mil/dhp/OE/ESOHSC/laserinjury/.

RADIOFREQUENCY SURVEILLANCE PROGRAM

1. Personnel who are clearly identified as at risk from duties concerning activities or operations involving required, intentional, and recurrent overexposures to radiofrequency radiation (RFR) more than five times the maximum permissible exposure (MPE) or exposure reference level (ERL) will be enrolled in the Radiofrequency Surveillance Program (RFSP), per reference (j). The command radiofrequency safety officer or medical officer or senior medical provider will determine personnel enrollment in the RFSP. RFSP consideration would likely come from the groups listed in subparagraphs 1a and 1b:

a. Personnel who repair or maintain high energy RFR systems while energized.

b. Personnel who may be required to enter areas of known RFR fields to perform mission essential duties, with a risk of exceeding five times the MPE or ERL.

2. Medical surveillance is generally not required for other personnel working on or around conventional radiofrequency systems when it is possible, but unlikely, for them to exceed five times the MPE or ERL.

3. There are three types of examinations for the RFSP: baseline, situational, and termination radiofrequency examination. RFSP examinations will clearly state the type and purpose of medical examination.

a. Baseline examinations are required to establish a baseline against which damage can be measured in the event of an injury and to identify certain workers who may be at special risk from exposure to select RFR systems at greater than five times the MPE or ERL. Conduct a baseline examination before initial assignment involving the radiofrequency radiation exposure risk. Examinations for other purposes that include the required information satisfy the requisites of this instruction.

b. Periodic medical examinations are not required.

c. Situational examinations are required when an actual or suspected radiofrequency induced injury occurs. The injury should be evaluated by a medical professional as soon as possible. Referral for medical examinations will be consistent with the medical symptoms and the anticipated biological effect(s). For radio frequency-induced injury to the eye, the initial medical evaluation must be performed by a qualified medical provider with follow-up by an ophthalmologist or optometrist, as indicated. Auditory and skin injuries should initially be evaluated by a medical provider with applicable follow-up by an audiologist or dermatologist, as needed.

d. Termination examinations provide evidence and documentation of health conditions that the employee may have at the time of being removed from the RFSP. Termination examinations

will be administered after the Service member has been permanently excused from duties requiring inclusion in the RFSP. When constrained by ship operations or deployment, perform the examination as soon as practical.

e. In the event of a situational exam and optometry and ophthalmology are not immediately available, exams may include, but are not limited to the following as deemed appropriate by the senior medical provider: amsler grid or other tests of macular function for distortions or scotomas; dilated, direct view ophthalmoscopic examinations of the retina; slit lamp examinations of the cornea and lens to describe any pathology or deviations from the normal; and retinal photos to document any lesions or pre-existing conditions. Sites where overexposures to RFR pose potential risk to the eye must have ready access to equipment required for such tests.

f. For personnel who have been removed from the RFSP with a termination exam and have a documented reason why they must return to the RFSP, a new baseline examination will need to be performed prior to resumption of duties. A second termination exam will be administered as near as practical to the date the individual will again be terminated from duties requiring inclusion in the RFSP.

4. RFSP examinations must include:

a. Ocular histories with special emphasis on including a record of the current refraction prescription and the date of the most recent examination.

b. Visual acuity for far and near vision.

c. External ocular and fundus examination.

d. Audiometric examination (separate from the hearing conservation program) for the establishment of a baseline.

e. Evaluations of unusual skin sensitivity, skin diseases, or both.

f. As deemed necessary by the medical examiner, refer examinee to ophthalmology or optometry for additional evaluation.

g. As deemed necessary by the medical examiner, perform any additional examinations based on radiofrequency system risk assessment.

RADIOFREQUENCY RADIATION OVEREXPOSURE INCIDENT ACTIONS

1. In the event of any suspected or known overexposure to electromagnetic field (EMF) radiation, immediately discontinue EMF radiation operations. Suspected overexposures will be reported to the command safety officer (industrial hygiene, environmental health, radiation health, radiation safety, or radiofrequency safety officers), who will investigate and document incidents involving personnel exposure that may exceed the zone 0 exposure reference level (ERL) or maximum permissible exposure (MPE) in reference (k) available at Web site, https://webstore.ansi.org/Standards/IEEE/ieeec9523452014.

2. All injuries or suspected injuries must be reported immediately to the supervisor. Symptoms of microwave and radiofrequency radiation (RFR) overexposure are caused by heating body tissue. However, most overexposures to microwave and RFR are asymptomatic.

3. The safety officer will conduct an investigation to include calculations to determine the level of exposure received by the exposed individual. Assistance can be obtained by contacting the radiological hazards environmental characterization group from the Electromagnetic Measurements and Engineering Branch (Code B55) at Naval Surface Warfare Center Dahlgren at DSN 249-1419 (commercial (540) 653-1419). Accidents and incidents will be reported to the DoD EMF Injury Hotline at DSN 798-3764 (commercial (937) 938-3764), (888) 232-ESOH (3764), and Naval Safety Command Risk Management Information (RMI) System, with an electronic copy to BUMED-N35.

4. Include measurements or analysis, appropriate medical examinations, a detailed description of the circumstances surrounding the incident to determine root cause, and recommendations for preventing recurrence of similar incidents. Guidance for recording data, system operating characteristics, and medical outcomes are available from reference (l). Similar DoD Component-specific forms may be used. Medical providers should obtain further guidance from the DoD EMF Injury Hotline at (888) 232-3764 or commercial (937) 938-3764 or DSN 798-3764 or email.

5. For suspected overexposures in excess of the ERLs or MPE listed in references (k) and (n):

a. To shut down system, contact the local safety officer, and preserve or record the system settings.

b. Contact the DoD EMF Injury Hotline. This is recommended to be done by the medical provider but may also be performed by the LSO.

c. Use a trained EMF professional designated by the DoD component to measure EMFs and document the exposure using appropriate hazards of electromagnetic radiation to personnel surveys.

d. Contact the cognizant medical treatment facility for assessment and treatment, as needed. Arrange for transportation to cognizant treatment facility if necessary.

e. Prepare documentation that includes descriptions of the circumstances surrounding the exposure incident, statements from personnel involved in the incident, and recommendations to prevent similar occurrences.

f. To the maximum extent practical, complete and submit the EMF injury reporting documentation from the Environmental, Safety, and Occupational Health Service Center (available at CAC accessible Web site, https://hpws.afrl.af.mil/dhp/OE/ESOHSC/pages/index.cfm?id=335).

g. Maintain a file of all investigations and submit it to the EMF overexposure repository via e-mail at esoh.service.center@us.af.mil.

h. Maintain personal exposure assessments, medical exams, and evaluations per the recordkeeping guidelines of reference (c), chapter 4.

6. Refer for medical examination and follow-up, all personnel reporting physical symptoms or those suspected of exposure to levels more than five times the MPE or ERLs as soon as possible. Treat symptomatically and resolve any fears or anxieties of the patient by providing information on potential biological effects of RFR, potentially a referral to behavioral health may be warranted.

7. Implement the applicable investigative and reporting requirements for exposure incidents that meet the mishap criteria of references (l) and (m).

NON-IONIZING RADIATION OVEREXPOSURE INCIDENT GUIDELINES

1. An overexposure incident occurs when personnel are exposed beyond the non-ionizing radiation maximum permissible exposure for controlled or uncontrolled environments. Reporting individuals will follow the mishap reporting procedures outlined in references (b) through (n). The command exercising operational control has primary responsibility of investigation, notification, and reporting if necessary. Enclosure (4) can be used as a guide to gather applicable information following a known or suspected laser incident to assist in incident analysis and reporting.

2. Due to the propagation of laser and radiofrequency in military applications it is becoming more likely that one will encounter weapon and stand-off systems incorporating such technologies. Therefore, medical providers should be aware that the use of such weapons has the potential for psychological impact on Service members. Those who experience overexposure to non-ionizing radiation and have accompanying behavioral health symptoms can seek help from mental health professionals. Much of this impact can be alleviated by proper and well-directed education efforts. Most effects are only temporary and non-injurious. Localized overheating should be treated by immediate cooling of the area, similar to first or second degree burns. Whole body exposure resulting in an increased core body temperature (greater than 101 degrees Fahrenheit) should be treated with immediate cooling measures, similar to heat stress exposure. Reference (g) contains instructions for laser eye injuries.

3. It is important to remind patients that acute visual loss due to laser injury may improve with time. In addition, they should be reassured that it is unlikely that they will lose all vision resulting in blindness. The chief source of expert knowledge and education for commanders and their crew members will be medical personnel, particularly medical officers or senior medical providers, ophthalmologists, and optometrists. The medical officer, in conjunction with the platform industrial hygiene officer, environmental health officer, radiofrequency safety officer, and laser safety officer will actively participate in education sessions designed to teach pertinent crew members about non-ionizing radiation effects and subsequent personal protective equipment to protect themselves. Occupational medicine physicians, Navy aerospace optometrists, and aerospace and operational physiologists are productive sources of information, as they are specially trained in these areas.

4. In the case of eye injuries, ophthalmologists may be available at level three in-theater care and are available at out-of-theater definitive care sites. Optometrists may be available at level two in-theater care, usually available at level three in-theater care, and are available at out-of-theater definitive care sites.