Safety and Health Requirements for Minors

NIST S 7101.04
Document Approval Date: 12/23/2020
Effective Date: 05/23/2013

1. PURPOSE

To define the safety and health requirements specific to NIST employees and Guest Researchers under age 18, *i.e.*, minors.

2. BACKGROUND

Under certain conditions, qualified minors work at NIST as employees or Guest Researchers. As Guest Researchers, minors participate in the Student Volunteer Program (SVP), including the Summer High School Intern Program (SHIP). If they are college students, minors can also participate in the Summer Undergraduate Research Fellowships Program (SURF) and the Professional Research Experience Program (PREP; Boulder only).

3. APPLICABILITY

a. This suborder applies to all NIST employees and Guest Researchers under age 18 who could be exposed to hazards while present or conducting work in NIST work areas *other than* offices and office-like spaces (see definition of "Office-Like Space").

b. This suborder does not consider regulatory requirements related to hours of work or non-safety-and-health-related conditions of employment.

4. REFERENCES

a. 29 Code of Federal Regulations (CFR) 570, Child Labor Regulations, Orders, and Statements of Interpretation;

b. Code of Maryland, Labor and Employment Article, Title 3, Subtitle 2, Employment of Minors;

c. Colorado Revised Statutes 8-12-110, Hazardous Occupations for Minors;

d. South Carolina Child Labor Statute, §41-13-20;

e. 10 CFR 20.1201, Occupational Dose Limits for Adults;

f. 10 CFR 20.1207, Occupational Dose Limits for Minors; and

g. 10 CFR 20.1301, Dose Limits for Individual Members of the Public.

5. APPLICABLE NIST DIRECTIVES

a. NIST S 7101.20: *Work and Worker Authorization Based on Hazard Reviews*

6. REQUIREMENTS

a. General

To work at NIST as an employee, a minor must be at least 16 years of age. To work at NIST as a Guest Researcher, a minor must be at least 14 years of age.

b. Presence in Work Areas

Minors working at NIST as employees or Guest Researchers are *prohibited* from:

(1) Being exposed in any work area to recognized hazards that pose a higher than nominal risk to their safety or health (see definition of "Nominal Risk")[1].

(2) Being exposed in any work area to ionizing-radiation hazards that could result in their receiving an ionizing radiation dose exceeding the dose limits for members of the public *unless* they have been authorized in accordance with the requirements of the NIST ionizing radiation safety program to engage in work involving ionizing radiation, in which case the occupational dose limits for minors apply (see definition of "Occupational Dose Limits for Minors").

[1] Note that this does *not* mean that minors cannot be present or work in work areas in which activities are performed that involve hazards that pose a *higher* than nominal risk to safety or health. Minors *may* be present or work in such areas *provided* that (a) the activities in question are not being performed while the minor is present, (b) additional controls are implemented while the minor is present to reduce the risk to the minor's safety or health to a level that is no higher than nominal, or (c) the minor is asked to leave the work area when those activities are being performed.

c. Work

(1) Minors aged 14 or 15 working at NIST as Guest Researchers are expressly *prohibited* by regulation from engaging in the following:[2]

(a) Work involving operating, tending, setting up, adjusting, cleaning, oiling, or repairing hoisting apparatus;

(b) Work performed in or about boiler or engine rooms or in connection with the maintenance or repair of machines or equipment;

(c) Work involving operating, tending, setting up, adjusting, cleaning, oiling, or repairing any power-driven machinery, including lawnmowers, golf carts, trimmers, cutters, weed-eaters, and edgers;

(d) Work involving working from window sills or the use of ladders, scaffolds, or their substitutes;

(e) Work involving the loading and unloading of goods or property onto or from motor vehicles;

(f) Occupations in connection with warehousing and storage;

(g) Occupations in connection with construction, including demolition and repair; and

(h) Work prohibited for minors aged 16 or 17 (see below).

(2) Minors aged 16 or 17 working at NIST as employees or Guest Researchers are expressly *prohibited* by regulation from engaging in the following:[2,3]

(a) Occupations involving the manufacturing, storing, or use of explosives, including articles containing explosive components;

(b) Occupations involving the manufacturing, storing, or use of radium-containing self-luminous compounds;

(c) Occupations of motor-vehicle driver and outside helper;

[2] These prohibitions are headings in 29 CFR 570; for details regarding their meaning, see 29 CFR 570.
[3] Exemptions to some of these prohibitions are possible under certain circumstances, e.g., if the work is conducted in connection with an established apprenticeship program. For further information, contact OSHE.

(d) Work involving the operation of power-driven woodworking machines;

(e) Occupations involved in the operation of power-driven hoisting apparatus;

(f) Work involving the operation of power-driven metal forming, punching, and shearing machines;

(g) Work involving the operation of circular saws, band saws, guillotine shears, chain saws, reciprocating saws, wood chippers, and abrasive cutting discs;

(h) Work involving the erection or repair of electrical wires;

(i) Occupations involved in wrecking or demolition;

(j) Work involving roofing operations and being on or about a roof; and

(k) Work involving excavation operations.

(3) Minors aged 16 or 17 working at NIST as employees and minors aged 14 to 17 working at NIST as Guest Researchers are *permitted* to engage in work not prohibited above provided that:

(a) Recognized hazards associated with the work and other activities in the work area pose no higher than a nominal risk to their safety and health;

(b) The work is conducted in full compliance with all applicable NIST and OU safety and health requirements; and

(c) The work, if it involves ionizing radiation, is conducted in a manner in which occupational radiation dose is kept As Low As is Reasonably Achievable (ALARA) and does not exceed the annual occupational dose limits for minors.

d. Forms

Forms applicable to minors working at NIST as employees or Guest Researchers must be completed by the minors, their parents or guardians, and the NIST OUs in accordance with requirements maintained by the Office of Workforce Management (employees) and the International and Academic Affairs Office (Guest Researchers).

7. DEFINITIONS

a. Dose Limits for Members of the Public – A total effective dose equivalent from licensed operation of 100 mrem (1 mSv) in a year, or a dose in any unrestricted area from external sources of 2 mrem (0.02 mSv) in any one hour (for details, see 10 CFR 20.1301).

b. Employee – An individual employed by NIST who has been issued a NIST employee badge.

c. Guest Researcher – A type of NIST associate.

d. Host – A NIST employee who is responsible for overseeing the activities of a minor working at NIST as a NIST Guest Researcher.

e. Minor – Any individual under age 18.

f. NIST Associate – An individual working at but not employed by NIST. Types of NIST associates include, but are not limited to, foreign and domestic guest researchers and NIST facility users (see NAIS Guest Researchers).

g. Nominal Risk – (a) A risk that is assessed as "Low" or "Minimal" in a hazard review based on the risk-assessment matrix in Appendix A[4] (or equivalent), or (b) a risk that is assessed as "Medium" and with additional documentation to support accepting the risk for minors.[5] In both cases, the assessed risk is the risk with all controls[6] implemented.

h. Occupational Dose Limits for Adults – (a) The more limiting of a total effective dose equivalent of 5 rem (0.05 Sv) in a year and the sum of the deep-dose equivalent and the committed dose equivalent to any individual organ or tissue other than the lens of the eye of 50 rem (0.5 Sv) in a year; (b) a lens dose equivalent to the eye of 15 rem (0.15 Sv) in a year; and (c) a shallow-dose equivalent of 50 rem (0.5 Sv) to the skin of the whole body or to the skin of any extremity in a year (for details, see 10 CFR 20.1201).

i. Occupational Dose Limits for Minors – 10% of the annual occupational dose limits for adult workers (see 10 CFR 20.1207 and the definition of "Occupational Dose Limits for Adults").

---

[4] Adapted from ANSI/AIHA Z10-2005, American National Standard – Occupational Health and Safety Management Systems.

[5] Such documentation could address considerations such as the qualifications of the minor and the implementation of additional controls to reduce the risk to levels that are as low as reasonably achievable, recognizing that the "Medium" level of risk spans a wide range of hazards and risks and that distinctions between "Medium" and "Low" levels of risk are subjective. Such documentation could be part of the hazard review or an addendum to a hazard review.

[6] Classes of "controls" include engineering controls, administrative controls, and personal protective equipment. Types of administrative control include, but are not limited to, access controls; procedures; training, including on-the-job training; and supervision at a level warranted by the circumstances.

j. Office-Like Space – A space, such as a conference room, mail room, or computer room that has the same types of hazards as a typical office or office environment.

k. Organizational Unit (OU) – Term used herein to denote any of the following: the Office of the Director; the immediate offices of the three Associate Directors; the two NIST Centers; the four NIST Laboratories; the three Extramural Programs; and the five Chief Offices.

l. Work Area – Any space or part of a space in which NIST work is conducted.

8. ACRONYMS

a. ALARA – As Low As is Reasonably Achievable

b. CFR – Code of Federal Regulations

c. OSHE – Office of Safety, Health, and Environment

d. OU – Organizational Unit

e. PREP – Professional Research Experience Program (Boulder)

f. SHIP – Summer High School Intern Program

g. SURF – Summer Undergraduate Research Fellowships Program

h. SVP – Student Volunteer Program

9. RESPONSIBILITIES

a. NIST Supervisors or Hosts:

(1) Ensure that employees knowledgeable of the hazards to which minors could be exposed while present or working in a work area have performed a hazard review in accordance with the NIST Hazard Analysis and Control Program and applicable OU procedures and have identified the controls necessary to mitigate those risks to the nominal level[7];

(2) Ensure that minors are not permitted to engage in work expressly prohibited above;

[7] Such a hazard review may, if permitted by OU procedures, stand alone, be an addendum to another hazard review, or be part of a hazard review of work of larger scope.

(3) Ensure that work by minors is conducted in full compliance with all applicable NIST and OU safety and health requirements, including requirements resulting from hazard reviews, i.e., for the implementation of controls; and

(4) Ensure that work by minors involving ionizing radiation is conducted in a manner in which occupational ionizing-radiation dose is kept As Low As is Reasonably Achievable (ALARA) and does not exceed the annual occupational dose limits for minors.

b. OU Directors:

(1) When the nominal risk is assessed as "Medium" (see definition of "Nominal Risk"), determining whether the additional documentation provided is sufficient, based on the circumstances, to warrant accepting the risk to the minor, and if it is, signing the documentation indicating their approval.

10. AUTHORITIES

a. OU Directors:

(1) May delegate the authority to accept nominal risks assessed as "Medium" to OU Deputy Directors or Division Chiefs, or, in the case of OUs that do not have Division Chiefs, Division-Chief equivalents[8].

11. DIRECTIVE OWNER

Chief Safety Officer

12. APPENDICES

a. Appendix A. Risk Assessment Matrix

b. Appendix B. Revision History

[8] The NIST Center for Neutron Research and the Center for Nanoscale Science and Technology do not have Division Chiefs.

Appendix A. Risk Assessment Matrix

		POTENTIAL SEVERITY OF HAZARD			
		Catastrophic Death or permanent disability System or facility loss Lasting environmental or public-health impact	**Severe** Serious injury; temporary disability Subsystem loss or significant facility/property damage Temporary environmental or public-health impact	**Moderate** Medical treatment beyond first aid; lost-work-day(s) More than slight facility/property damage External reporting/ requirements; more than routine clean-up	**Minor** First-aid only Negligible or slight facility/property damage No external reporting requirements; routine clean-up
LIKELIHOOD OF OCCURRENCE	**Frequent** Likely to occur repeatedly	**CRITICAL**	**CRITICAL**	**SERIOUS**	**Medium**
	Probable Likely to occur multiple but infrequent times	**CRITICAL**	**CRITICAL**	**SERIOUS**	**Medium**
	Occasional Likely to occur at some time	**CRITICAL**	**SERIOUS**	**Medium**	**Low**
	Remote Possible, but not likely to occur	**SERIOUS**	**Medium**	**Medium**	**Low**
	Improbable Very unlikely; can reasonably assume it will not occur	**Medium**	**Low**	**Low**	**Minimal**

Appendix B. Revision History

Revision	Date	Responsible Person	Description of Change
1	12/23/2020	April Camenisch	Updated links under References and Suborders.