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Ames Procedural Requiements

APR 8715.1

Effective Date: July 12, 2012
Expiration Date: March 31, 2018

COMPLIANCE IS MANDATORY

NASA Ames Health and Safety Manual

Chapter 20 - Fire Protection

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20.1 Overview

This chapter provides fire protection requirements for personnel and property.

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20.2 References

1. NPR 8715.3C, NASA General Safety Program Requirements
2. NASA Technical Standard 8719.11A, Safety Standard for Fire Protection
3. National Fire Protection Association (NFPA) Latest Codes and Standards
4. Unified Facilities Criteria (UFC) Design: Fire Protection Engineering for Facilities, UFC 3-600-01, Department of Defense

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20.3 Responsibilities

20.3.1 Occupational Safety, Health and Medical Services

The Safety, Health and Medical Services Division shall be responsible for oversight of fire protection engineering functions, which consists of the following:

1. Provide consultation on fire protection issues,
2. New construction design/plan review and authorization,
3. Facility modification design/plan review and authorization,
4. Witness fire suppression and fire alarm acceptance testing,
5. Oversight and management of fire extinguisher maintenance for facilities occupied by NASA and/or by NASA contractors.
6. Provide guide specifications for fire protection equipment and systems.
7. Provide periodic Center-wide assessments of fire protection.

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20.3.2 Protective Services Office

The Authority Having Jurisdiction (AHJ) is the individual at the Center responsible for implementation the fire safety provisions of NASA-STD 8719.11 and has the authority for **◆**approving/concurring**◆** associated installations, procedures, and equipment. At Ames Research Center the Fire Marshal in Code JP has been designated as the Authority Having Jurisdiction.

The Protective Services Office has responsibility for the fire prevention program development and implementation, which includes the following:

1. Conduct formally scheduled fire prevention inspections of all facilities at least annually, and more frequently for special and high-hazard occupancies (i.e., conduct quarterly inspections of aircraft hangars).
2. Notify NASA supervisors of inspection findings and recommendations.
3. Track inspection recommendations through abatement and resolution of failure to abate issues.
4. Serve as focal point for resolution of fire safety issues from the Fire Department (other than from routine inspections) and other base personnel.
5. Resolve Multi-tenant occupancy fire prevention issues.
6. Coordinate with facility management for the conduct of annual fire drills of each facility and site familiarization activity for the Fire Department.
7. Establish and maintain adequate Fire Department manpower and equipment.
8. Issue Hot Work Permits.
9. Ensure appropriate occupancy classification for changes in use.

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20.3.3 Plant Engineering Branch

The Plant Engineering Branch shall be responsible for inspection and maintenance of the following:

1. Installed fire suppression, fire detection and fire alarm systems.
2. Water distribution system.
3. Fire doors, fire dampers, fire windows and penetration seals in fire barriers.

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20.3.4 Supervisor

Supervisors shall be responsible for the following items:

1. Ensure that Hot Work Permits are obtained for all hot work operations as outlined in section 20.4.
2. Ensure that construction permits are obtained for all facility modifications.
3. Inspect fire extinguishers monthly.
4. Ensure workers evacuate during fire drills in buildings conducted at least once per year.
5. Keep exit routes clear of obstructions and fire doors closed when not in use or held open by magnetic devices activated by the fire alarm system.
6. Provide training to employees in the Building Emergency Action Plan (BEAP).
7. Comply with housekeeping requirements in paragraph 11.6 of NASA-STD-8719.11A.

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20.3.5 Employees

Employees are responsible for the following:

1. The first responsibility of each employee shall be to immediately evacuate and assist others to evacuate the scene of a fire. Employees shall warn others in danger, while evacuating.
2. The second responsibility of each employee is to summon emergency services immediately. This is accomplished by activating the installed fire alarm system or by phoning emergency services at 9-1-1 or from mobile phones (650) 604-5555.
3. Employees are prohibited from using fire extinguishers unless trained, competent and authorized. Center records shall include current certification of training.
4. File a report on all fires after they have been extinguished via the mishap reporting procedures in Chapter 4 of this manual.

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20.4 Hot Work Permits

A signed hot work permit is required 24 hours in advance of any welding, cutting or burning operations. The permit will not be issued until:

1. It has been determined that the work can be safely conducted at the desired location.
2. Combustibles have been moved away or covered by an approved tarpaulin.
3. The atmosphere is nonflammable.
4. Precautions have been taken so that building fire detection and suppression systems will not be adversely affected.
5. If required by the permit issuer, provide a fire watch (with dedicated extinguisher) for the

duration of the work and for 30 minutes thereafter (60 minutes for torch-applied roofing operations) to ensure that sparks or drops of hot metal do not start fires. All cracks and openings in floors shall be safely covered or closed.

The permit shall be requested by contacting the Ames Fire Marshal, 4-4302. See Appendix A for a sample copy of the Hot Work Permit Form.

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20.5 Fire Protection Controls

20.5.1 Facility Fire Protection

Facility fire protection shall be managed at Ames in accordance with NASA-STD-8719.11, Safety Standard for Fire Protection and NFPA standards. Additional guidance shall be obtained from UFC 3-600-01, Design: Fire Protection Engineering for Facilities. Application of UFC 3-600-01 is mandatory for work in Army, Air Force, Navy and Air National Guard occupied facilities.

1. Automatic sprinkler systems shall be provided for all new building/facility construction. Sprinklers shall be provided in renovation projects over 2,500 square feet or involving over 50 percent of the building construction. The design, installation, and maintenance of sprinkler systems shall be in accordance with NASA-STD-8719.11, NFPA 13, 13D, 13R, 25, 29 CFR 1910.159, and the additional requirements provided below. All automatic sprinkler plans shall be authorized by the Ames Fire Marshal and AHJ or his/her designee prior to installation.
2. Emergency Voice Alarms Systems shall be installed in new or major renovations of assembly buildings, occupied buildings over 75 feet high, and in all major office-type occupancies over 75,000 square feet.
3. At least two working days prior, all facility partition or wall changes, regardless of size, fire protection system installations and modifications shall be submitted to the Safety, Health and Medical Services Division for review and authorization.
4. The shut-off or outage of any fire protection, life safety system, or feature shall be avoided. Where necessary for maintenance or construction, the disruption of service or feature shall be scheduled in advance with the NASA Fire Department and Ames Fire Marshal.
5. Sprinkler systems shall remain active in all buildings including vacated buildings.

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20.5.2 Magnesium or other Pyrophoric Materials

The following precautions shall be observed when using magnesium, pyrophoric and toxic materials:

1. Accumulation of magnesium chips on or around machines is forbidden. Clean accumulation often and place in a special container marked **◆MAGNESIUM.◆** Keep the container in an open area.
2. Blowing chips with air is forbidden. This practice may produce a future fire-hazard potential.
3. Deliver the container with chips to a supervisor at the end of the shift for proper disposal.
4. While machining magnesium, keep a magnesium fire extinguisher in the immediate area for instant use. Review directions on the extinguisher before beginning machining operation.
5. Machine magnesium DRY. Never use moisture. On occasions some oils are permitted. Check with the supervisor.
6. Never use a vacuum cleaner for chip removal from the machine.

7. Any deviations from these procedures may be made only with supervisory approval.
8. A written Job Safety Analysis (JSA) shall be provided for work tasks described in this paragraph.

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20.5.3 Portable Fire Extinguishers

1. Portable fire extinguishers shall be provided at facilities supporting the NASA mission.
2. Extinguishers shall be provided for use by the Moffett Fire Department.
3. Inspection, service and maintenance shall be in accordance with NFPA 10.
4. The use of extinguishers and restrictions of use shall be in accordance with paragraph 20.3.5, Responsibilities.

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Appendix A: Hot Work Permit Form

NASA Ames Hot Work Permit			Expiration Date:
<p>Seek an alternative/safer method if possible!</p> <p><small>This Hot Work Permit is required for any operation involving open flame or producing heat and/or sparks. This work includes, but is not limited to, welding, brazing, cutting, grinding, soldering, thawing pipe, torch-applied roofing, powder actuated tools or chemical welding.</small></p>			<p>____/____/____</p>
Permit Number:	Permit Valid Date:	Time Started:	Time Completed:
		____/____/____	
1. Requester's name, Organization/Company, Phone Number			
2. Location (Building/Rm #/Outside)			
3. Operation to be Performed			
4. Precautions to follow			
<input type="checkbox"/> Available sprinklers, hose streams, and extinguishers are in service and operable. If buildings or areas are equipped with smoke or flame sensing detectors, <u>the alarm techs shall be notified prior to commencing work</u> (650) 604-5961 or (650) 604-5416.			
<input type="checkbox"/> Hot work equipment is in good working condition in accordance with manufacturer's specifications.			
<input type="checkbox"/> Provide adequate ventilation in areas where smoke and harmful fumes or vapors may be generated.			
Requirements within 35 ft (11 m) of hot work			
<input type="checkbox"/> Flammable liquid, dust, lint, and oily deposits removed.			
<input type="checkbox"/> Explosive atmosphere in area eliminated.			
<input type="checkbox"/> Floors swept clean and trash removed.			
<input type="checkbox"/> Combustible floors wet down or covered with damp sand or fire-resistive/noncombustible materials or equivalent.			
<input type="checkbox"/> Personnel protected from electrical shock when floors are wet.			
<input type="checkbox"/> Other combustible storage material removed or covered with listed or approved materials (welding pads, blankets, or curtains; fire-resistive tarpaulins), metal shields, or noncombustible materials.			
<input type="checkbox"/> All wall and floor openings covered.			
<input type="checkbox"/> Ducts and conveyors that might carry sparks to distant combustible material covered, protected, or shut down.			
Requirements for hot work on walls, ceilings, or roofs			
<input type="checkbox"/> Construction is noncombustible and without combustible coverings or insulation.			
<input type="checkbox"/> Combustible material on other side of walls, ceilings, or roofs is moved away.			
<input type="checkbox"/> Fire watch is provided during hot work on roofs for a minimum of 60 min, after hot work, including any break activity.			
Requirements for hot work on enclosed equipment/system / space			
<input type="checkbox"/> Enclosed equipment is cleaned of all combustibles. Containers are purged of flammable liquid/ vapor.			

- Adequate ventilation equipment provided, operable and intrinsically safe.
- Pressurized vessels, piping, and equipment removed from service, isolated, and vented.

Requirements for hot work fire watch and fire monitoring

- Provided during and for a minimum of 30 min. after hot work, including any break activity.
- Provided with approved type and size of fire extinguishers and, where practical, a fire hose. These have to be immediately available for use.
- Trained in use of equipment and in sounding alarm.
- Required in adjoining areas including above and/or below as applicable.
- Yes No Per the PAI/fire watch, monitoring of hot work area has been extended beyond the 30 min.

5. Immediately report any **FIRE or EMERGENCY** to Moffett Field dispatch. Dial 9-1-1 or **(650)604-5555** from a mobile phone

6. I am fully qualified to perform this operation and understand my responsibilities regarding fire safety on this operation, and will apply and abide by the precautions outlined above.

SIGNATURE of Official-in-Charge or Designated Representative performing Hot Work

7. I verify that the above location has been examined, the precautions marked on the checklist above have been taken, and permission is granted for this work.

Name (print)

SIGNATURE of permit-authorizing individual (PAI)

Date

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