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CHAPTER 5.8 HAZARDOUS OPERATIONS: SAFE PRACTICES AND CERTIFICATION

5.8.1. Applicability of this chapter

You are required to follow this chapter if you do or oversee any hazardous operations at JSC or JSC field sites. Paragraph 5.8.21 lists the responsibilities of supervisors, JSC managers, safety representatives, certified confined space supervisors, contracting officers, the Safety and Test Operations Division, Occupational Health, and the Employee Development Branch.

5.8.2. Hazardous operations

A hazardous operations involve hazardous materials, conditions, or equipment that could result in injury or property damage if you don't follow special precautions.

5.8.3. Requirements for any hazardous operation

5.8.3.1 Employees who do or oversee hazardous operations shall:

- a. Decide which category—I, II, III, or IV—the operation belongs in and follow the appropriate certification requirements. See paragraphs 5.8.4, 5.8.5, 5.8.6, and 5.8.7.
- b. Inform their organizational director of the risks involved in any new or non-routine hazardous operation with the potential for death, serious injury, or loss of critical high-dollar-value hardware before you start.
- c. As a supervisor, make sure everyone follows any requirements applicable to the operation or listed on the permit.
- d. As a supervisor, use a JHA to evaluate each hazardous operation where the risk is high, to determine if using a “buddy system” applies. Concurrence from the Safety and Test Operations Division is required for a determination of “non-applicable.” When applicable, use the “buddy system” with at least one standby person in one of these ways:
 - (1) One does the job and the other watches from the immediate area of the job to make sure the “worker” is safe.
 - (2) Two do the job and keep in constant contact with a standby person electronically, mechanically, or visually. The standby person shall remain in the immediate area where the other two are working.
 - (3) Two do the job and keep in contact with a standby person by coded lifeline signals, even though they may be out of sight of the standby person. The responsible safety representative will decide how many worker and standby person combinations there need to be.
- e. Take extra care, as a supervisor, to recognize and respond to dangerous situations when:
 - (1) Employees work in hazardous areas where they aren't normally assigned.
 - (2) Employees are working near public access areas.

5.8.4. Requirements for Category I hazardous operations

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5.8.4.1 Category I operations involve operations that are likely to either cause death or serious injury or high-dollar property damage and require management certification. Category I operations include, but are not limited to, those listed in the table on the following page. Chapter numbers given are for chapters in this JPR. Employees who do Category I operations, shall have at least the following:

- a. Classroom or on-the-job training or both for initial certification, and then as needed.
- b. Written examination. Many chapters in this JPR and other requirements list training requirements for certain operations.
- c. Annual retraining that will include review of emergency response and first-aid procedures.
- d. Recertification as required or as necessary.
- e. Permits (hazardous operations procedure, hot work permit (HWP), or confined space entry permit).
- f. Physical examination, if required by Occupational Health. See Chapter 3.6, "Occupational Healthcare Program," for more details on physical examinations. Physiological training may also be required, see paragraphs 5.8.8 and 9.

<i>For these personnel or operations . . .</i>	<i>Permit required . . .</i>	<i>Physiology Training required?</i>	<i>Medical Exam required?</i>	<i>Follow requirements in . . .</i>
Working as part of an aircrew	none	yes***	yes	n/a
Operating aircraft engine test cells (T-38 aircraft sound suppression facility)	none	no	yes	n/a
Operating a crane	Procedure, for heavy lifts	no	some, see Chapter 3.6	Chapter 8.5
Handling or using explosives or pyrotechnics (ordnance category)	Procedure	no	yes	Chapter 9.5
Handling propellants	Procedure	no	yes	Chapter 9.5
Rescue personnel	none	yes***	yes	n/a
SCAPE operators	none	no	yes	n/a
Scuba diving and operating neutral buoyancy tanks	Procedure	no	yes	Chapter 6.5
Handling pesticides, insecticides, or herbicides	Procedure	no	yes	Chapter 9.3
Test directors and subjects	none	yes*	yes	Chapter 6.8
Test conductors and engineers	none	yes*	yes	Chapter 6.8
Washing windows on multistoried buildings	none	no	no	Chapter 8.7
Handling lithium cells or batteries	none	no	no	Chapter 6.1

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Working in Permit Required Confined Spaces	CSE Procedure and Permit	no	yes**	Chapter 6.9
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*Required for human occupied hyperbaric and hypobaric activities only, see paragraph 5.8.8.

** Required only for entry into Permit-Required confined spaces.

*** See paragraph 5.8.8

5.8.5. Requirements for Category II hazardous operations

Category II operations involve operations that, if not done correctly, could create a severe hazard to the operator or user, other personnel, or property, and require management certification. The requirements for Category II operations are similar to those for Category I operations. Directorate organizations may reduce the levels of physical examination, training, and testing because of the lower hazard levels. Directorate organizations shall determine the certification and recertification requirements with the concurrence of the Safety and Test Operations Division or Occupational Health. Category II operations include, but are not limited to, those listed in the following table. Chapter numbers given are for chapters in this JPR.

<i>For these personnel or operations . . .</i>	<i>Permit required . . .</i>	<i>Physiology Training required?</i>	<i>Medical Exam required?</i>	<i>Follow requirements in . . .</i>
Operating altitude chambers	Procedure	yes	yes	Chapter 6.8
Operating heavy equipment and rigging loads	none	no	yes	Chapter 8.5 and equipment manuals
Operating high-pressure liquid, vapor, or gas systems	none	no	no	n/a
Working with high-voltage electricity	Procedure	no	no	Chapters 8.1 and 8.2
Servicing and maintaining equipment with hazardous energy & Performing Lockout/Tagout	none	no	no	Chapter 8.2
Operating hyperbaric chamber	Procedure	yes*	yes	Chapter 6.8
Operating powder-actuated tool	Procedure	no	noise only	Chapter 8.6
Using radioactive materials or radiation-producing equipment (ionizing and nonionizing)	Procedure	no	no	Chapter 7.3 and Chapter 7.5
Operating boiler plants	none	no	noise only	n/a
Operating aerial baskets and truck platforms	Procedure	no	no	Chapter 8.7
Working with insulation	None	no	yes	n/a
Operating Class 3B and 4 lasers or solar simulators	Procedure	no	yes	Chapter 7.5 (laser only)

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Handling cryogenics	Procedure	no	no	Chapter 6.4
Pressure suit technicians	None	yes*	yes	n/a
Welding (fusion) on flight ground-support equipment	HWP	no	no	Chapter 8.4 and JSC 18323
Hand or automated wire wrapping	None	no	no	MIL-STD-1130b NASA STD-8739.4 & NASA STD-8739.5 for spaceflight
Hand soldering for flight and ground-support equipment	None	no	yes	NASA STD-8739.3
OSHA Class I, II, or III asbestos work	JF 644	no	yes	Chapter 5.7 and Part 12
Using Self Contained Breathing Apparatus	None	no	yes	n/a

* See paragraph 5.8.8

5.8.6. Requirements for Category III hazardous operations

5.8.6.1 Category III operations involve handling, transporting, and packaging of hazardous materials that do not disturb the integrity of the basic shipping container. Operations involving the reduction of palletized or otherwise combined items of packaged hazardous materials qualify as handling. Category III operations require training, certification, and a hazardous operations procedure as described in paragraph 5.8.15. Directorate organizations shall determine the certification period with concurrence from the Safety and Test Operations Division, or Occupational Health if none is required by state or federal laws. Employees who do Category III operations shall:

- a. Have specific training in federal, NASA, and JSC rules for preparing, packaging, marking, and transporting the material. Training shall include instruction in how to find both the specific hazards of the material(s) and the standard emergency and first-aid procedures to follow if a spill or exposure to the material occurs. This shall also include a review of the Safety Data Sheets (SDSs) before handling or transporting any material.
- b. Pass a written test to demonstrate the necessary knowledge and skills.
- c. Obtain a certification card or other written proof of certification and carry it. The card shall include name, date, materials handled, signature of certifying officer, and expiration date.

5.8.7. Requirements for Category IV hazardous operations

Category IV operations require a hazardous operations procedure as described in paragraph 5.8.15. Controlled areas require a hazard analysis and may require a procedure. Medical examinations are only required for certain operations. See Chapter 3.6 for more information on medical examinations. Category IV operations include, but are not limited to, those listed in the following table.

<i>For these personnel or operations . . .</i>	<i>Follow requirements in . . .</i>
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Hot work	Chapter 8.4 and paragraph 5.8.11 below
Working in acoustic and vibration chambers	Chapter 6.8
Working in acceleration facilities	Chapter 6.8
Working in impact testing facilities	Chapter 6.8
Working in oxygen-enriched or oxygen-deficient atmospheres	n/a
Demolition	29 CFR 1926.850
Using pneumatic and power-actuated devices that incorporate projectiles	Chapter 8.6
Excavation	29 CFR 1926.650 and 1926.651
Proof pressure-testing components or systems	n/a
Transferring, transporting, using, disposing of, or otherwise exposing personnel to cryogenic substances, explosives, radiation, etiological agents, flammable or combustible liquids or solids, propellants, poisons, corrosive or oxidizing materials, or compressed gases	Chapter 5.1 Chapter 8.5 Chapter 9.1
Transporting oversized loads or trailers that would require special permits on public roadways	Chapter 5.3
Working at heights of 20 feet or more	Chapter 8.7
Using "heavy lift" material handling equipment	Chapter 8.5
Working in a non-permit confined space or controlled area	Chapter 6.9
Doing hazardous waste operations	29 CFR 1910.120 40 CFR Parts 260–279

5.8.8. Requirements for physiological training

The positions mentioned in the table below require physiological training, both initial and refresher as indicated.

Position	Physiological Training		
	Initial	Refresher	Academic Only ¹
Astronauts, Aircrew (pilot, copilot, navigator, flight engineer, flight directors, and flight surgeons)	Yes ^{2,4}	5 Years ^{3,4}	No
Chamber lock and inside observers, rescue personnel, test or suited subjects, and others who are exposed to hypobaric environments greater than 10,000 ft. (less than 10.1 psi)	Yes ⁵	3 Years ⁶	No
Test directors and conductors, medical monitors, crew support conductors, flight controller, test articles environmental operators, pressure suit engineers and technicians who support hypobaric chamber test	Yes ^{5,7}	No	No

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operations or pressure suit and life support system testing in facilities that may expose humans to reduced barometric pressure including hypobaric chambers at the Crew and Thermal Systems Division.			
Other personnel not mentioned above who have direct responsibility for external hypobaric chamber operations and for the health and safety of individuals exposed to reduced barometric pressure	No	No	Initial Training Only
Ambient environment suited subjects with a test delta pressure above 2psi	No	No	3 years

Notes:

- ¹Academics only is a 4-hour course with no chamber flight.
- ² Initial Astronaut/Aircrew Physiological Training is a 9-hour course to include a Type I altitude chamber flight and rapid decompression.
- ³ Refresher Astronaut/Aircrew Physiological Training is a 2 ½ hour course to include a-Type III altitude chamber flight.
- ⁴ WB-57 Physiological Training is a 4.5-hour course to include a Type III chamber flight and a Type V Full Pressure Suit Rapid Decompression chamber flight.
- ⁵Initial Physiological Training is an 8-hour course to include a Type I altitude chamber flight and rapid decompression.
- ⁶Refresher Physiological Training is a 6-hour course to include a Type III altitude chamber flight.
- ⁷Personnel in this category are not expected to have exposure to hypobaric environments. The Type I altitude chamber flight and rapid decompression is voluntary with informed consent.

5.8.9. Requesting physiological training

- a. Ensure the applicant has a current Chamber Operations physical examination. Please refer to Chapter 3.6 for requesting physical examinations.
- b. Schedulers or Applicant should contact the Human Test Support Group by email (isc-htsq-staff-scheduling@mail.nasa.gov) or call (281-792-5722/281-483-8322). When requesting training, provide the following information:
 - (1) Applicant’s full name, organization and/or company affiliation
 - (2) Applicant’s work phone number
 - (3) Date and type of last physical examination
 - (4) Type of training requested and justification to attend training per JPR 1700.1, paragraph 5.8.8.
 - (5) Scheduler or supervisors name and phone number.

5.8.10. Work shift limits and balancing work-rest cycles

5.8.10.1 Shift limits prevent dangerous situations due to fatigue. Organizations whose employees perform shift work or work unusual shifts with prolonged worktimes shall follow the requirements in NPR 1800.1, NASA Occupational Health Program Procedures, Chapter 2.14, Shift Work and Balancing Work-Rest Cycles. The following requirements apply:

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- a. JSC defines critical positions to include, but are not limited to:
 - (1) Category I and II hazardous operations listed in paragraphs 5.8.4 and 5.8.5.
 - (2) Flight operations and operations with flight hardware.
 - (3) Hazardous tests or hazardous crew training.
 - (4) Working at heights of 20 feet or more.
 - (5) Working with cryogenics, hazardous materials, or hazardous waste.
 - (6) Construction, demolation, or excavation.
 - (7) Working in Controlled Areas.
- b. Employees who directly support tests shall:
 - (1) Never work a shift of more than 12 hours for continuous testing. Normal and desired shifts are 8 hours.
 - (2) Have a qualified relief every 4 hours so they can take rest breaks, unless their position allows them to take comfort breaks and have water and food during the test.
 - (3) Be off for at least 10 hours between shifts.
- c. Employees involved with hypobaric chamber activities shall:
 - (1) Be off for at least 24 hours before the test starts if they work 12-hour shifts during the pretest phase.
 - (2) Never start a test if the combined pretest hours worked and the test hours scheduled to complete the test will exceed 12 hours. Use a fresh test team to staff the duty stations of those whose shifts will exceed 12 hours.
 - (3) Never work more than five 12-hour shifts in a week without a day of rest right after the 60-hour work week.
 - (4) Never work more than 8 hours in a 24-hour period at altitude as an inside lock observer. A standard shift at altitude is 4 hours with a maximum of 6 hours. The medical monitor is responsible for monitoring lock observers for excessive fatigue.
- d. Have waivers for critical positions approved by the JSC Designated Safety and Health Official.
- e. Have waivers for non-critical positions approved by the Division Chief responsible for the facility.
- f. Intermittent hazardous operations may exceed 12 hours on the job if there is rest time between operations, but shall not exceed 16 hours.
- g. Waiver requests shall include, as needed, the rationale for the waiver, the reason you can't fully comply, alternatives, program impact, hazard assessment, and an assessment by the Space and Life Sciences Directorate. Send a copy of the approved waiver to the Safety and Mission Assurance Directorate.

5.8.11. Requirements for “hot work”

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5.8.11.1 “Hot work” is any work involving burning, welding, or similar operations capable of initiating fires or explosions. To do any hot work on cooling towers, anechoic chambers, or mockup areas, first get approval from the Safety and Test Operations Division. Send a written statement to the Safety and Test Operations Division justifying the need for the work for review and approval. Employees involved in any hot work shall:

- a. Never do any hot work outside of a designated hot work area without an approved hot work permit. See subparagraph 5.8.12 for more information on permits. See paragraph 5.8.13 below for information on designated hot work areas.
- b. Notify the facility fire wardens and remove ordinary combustibles to reduce the chance of a fire.

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- c. Post a fire watch to recognize fire hazards, notify appropriate responsible persons in the event of an emergency, start an orderly emergency evacuation when appropriate, and safely use a small portable fire extinguisher. The fire watch shall:
- (1) Take appropriate action if potential fire hazards are observed. This includes notifying responsible persons of the observed hazards.
 - (2) Prevent fires from occurring. For example, be aware of where falling sparks may land and prevent them from falling into any sewer system or onto combustible materials. Maintain adequate clearance between ignition sources and combustible materials.
 - (3) Maintain a close watch on any locations where hot work has been done to make sure there are no imbedded hot spots or flare-ups.
 - (4) Notify the Emergency Operations Center, x33333 or (281) 483-3333, and building occupants of a fire and start an evacuation.
 - (5) Extinguish small fires if it can be done safely.

5.8.12. Permit-required hot work areas

A permit-required area is an area made fire-safe by removing or protecting combustibles from ignition sources. A hot work permit is required for any hot work. See subparagraph 5.8.13.1.c through 5.8.13.1.e. for more information. The Safety and Test Operations Division and Occupational Health shall review permit-required hot work areas during each annual safety, health, and fire protection inspection.

5.8.13. Designated hot work areas

5.8.13.1 A designated hot work area is a permanent location approved for hot work operations that will be done regularly. To set up a designated hot work area, you shall:

- a. Form a team to review the area. The review includes an on-site survey of the area and a meeting to discuss any discrepancies or concerns. The team shall consist of the following individuals, as a minimum:
 - (1) Safety and Test Operations Division representative.
 - (2) Occupational Health representative.
 - (3) Fire Protection engineer.
 - (4) Facility Manager.
 - (5) Contractor Safety Representative for contractor operations.
 - (6) The manager(s) over the proposed area.
- b. Meet the following requirements:
 - (1) The area shall be specifically designed or approved for hot work, such as a maintenance shop or a detached outside location.
 - (2) The structure shall be made of noncombustible or fire-resistive materials, essentially free of combustible and flammable contents, and suitably segregated from adjacent areas.

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- (3) Chapters 5.1, “Fire Safety,” and 8.4, “Welding, Cutting, and Brazing Safely.”
- (4) NASA-STD-8719.11, “Safety Standard for Fire Protection.”
- (5) National Fire Protection Association Standard 1, “National Fire Prevention Code.”
- (6) NFPA 51B, “Standard for Fire Prevention During Welding, Cutting and Other Hot Work.”
- c. Submit a plan to the team in subparagraph a. above. The plan shall include, as a minimum:
 - (1) A description of the process and related activities planned.
 - (2) Location and floor plan, indicating the location of extinguishers, pull stations, phones, emergency egress routes, nearest flammable and combustible materials, etc.
 - (3) The type of fire alarm and suppression systems in the area.
 - (4) A list of any associated hazards and controls.
 - (5) A hazard analysis for the planned activities.
 - (6) A JHA for the planned activities.
 - (7) An Emergency Evacuation Plan.
 - (8) An air quality survey.
 - (9) A list of responsible individuals and contacts.
- d. Attach a signature page to the plan to include concurrence signatures of the review team members (subparagraph (a) above) once their concerns have been identified and addressed.
- e. Present the plan, with concurrences noted on signature page, to the JSC Authority Having Jurisdiction or the Chief, Safety and Test Operations Division, or both, for final approval.
- f. Keep one copy conspicuously posted in the designated hot work area and provide another to the JSC Fire Specialists.
- g. Reevaluate the area yearly.

5.8.14. Permits for hazardous operations

5.8.14.1 Permits are required for certain hazardous operations before work may begin. Fill out the permit form and post the completed permit at the job site until the job is over. Some operations, such as welding in a confined space, require two or more permits. Permits are only good for a limited time, such as one shift, and expire on the date and time shown on the permit. The following permits, when required, shall be posted at the job site along with any procedures used:

- a. A confined space entry permit any time employees enter a confined space. See Chapter 6.9, “Entering Confined Spaces,” for more details.
- b. A hot work permit for any work involving burning, welding, or similar operations capable of initiating fires or explosions outside a designated hot work area. Use JSC Form 1475, “Hot Work-Welding-Cutting Permit,” Appendix D. Electric soldering irons, hot plates, coffee pots, and similar appliances don’t require a permit. Hot work permits are valid for no longer than 1 week. The flowchart in figure 5.8-1 describes the steps to complete a hot work permit.

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NOTE: As a fire warden, contractor safety representative, safety point of contact, or facility manager, you shall contact Occupational Health if you suspect any exposure or health issue with the hot work.

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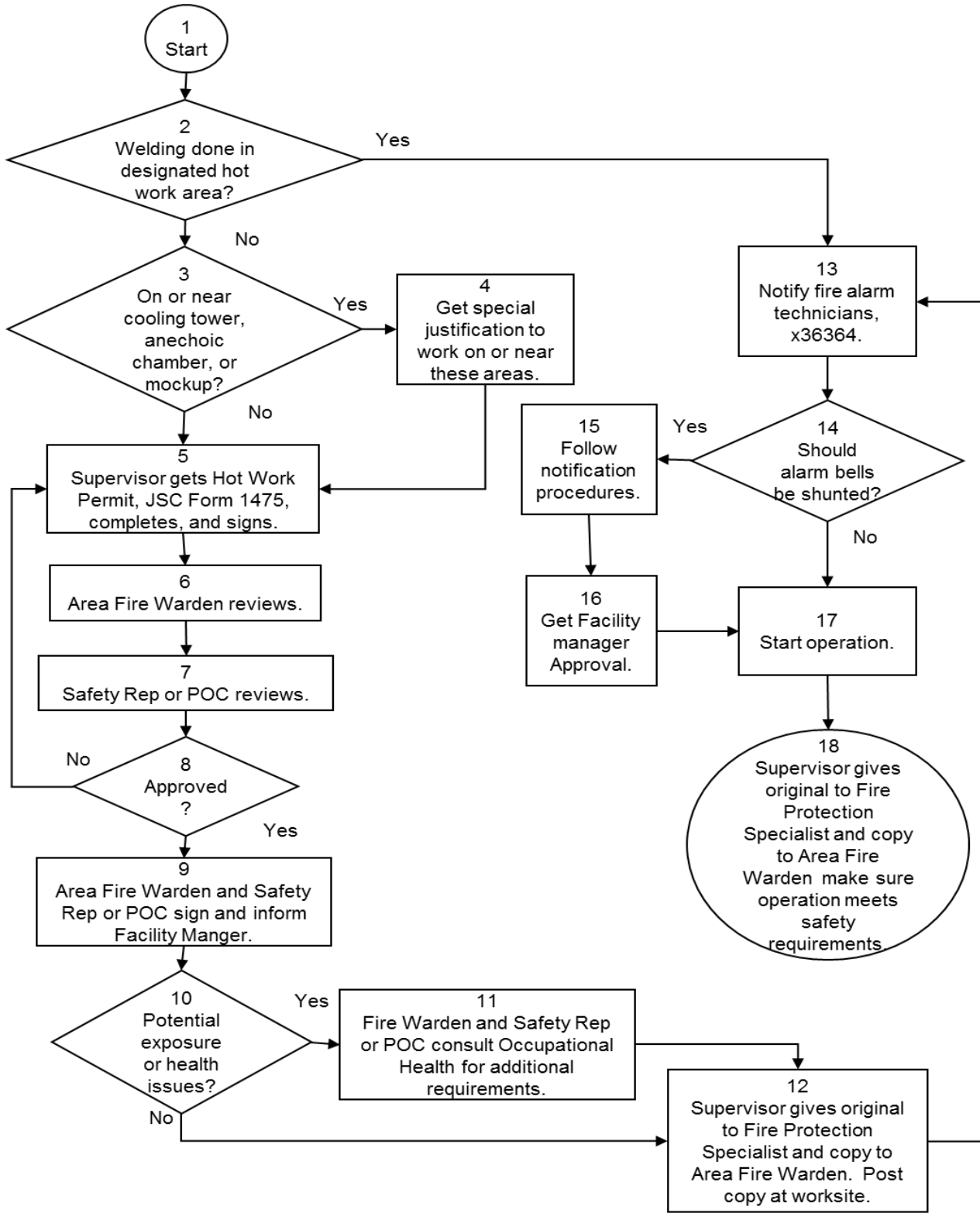


Figure 5.8-1, Hot work permit flow chart

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5.8.15. Hazardous Operations Procedure

5.8.15.1 A written, detailed procedure is required before engaging in any hazardous operations. The procedure requires approval by management and a corresponding hazard analysis that has been reviewed and concurred by required personnel as specified in paragraph 2.3.8 of Chapter 2.3. Confined space entry and hot work permits are always required. Employees who perform hazardous operations procedures shall:

- a. Include the following in the procedure:
 - (1) The statement, "This document contains hazardous operations and strict adherence is necessary for safety and health," conspicuously on the title page.
 - (2) The title and telephone extension of each person who would normally receive a copy of the permit with the procedure.
 - (3) Enough detail to identify residual hazards and warnings to personnel. This includes necessary tools, safe work practices, personal protective equipment, and worker qualifications. Use a JHA to identify hazards and controls.
 - (4) Equipment diagrams to clarify the equipment configurations.
- b. Contact those listed under subparagraph (a) above to let them know about the work before starting.
- c. Post a copy of the procedure at the job site and verify a permit has been posted.
- d. Send any revisions to the procedure to the Safety and Test Operations Division for review and approval.
- e. Review and update the procedures at least yearly.

5.8.16. Certification process

5.8.16.1 To be certified, employees need to demonstrate the necessary knowledge, skills, judgment, and physical ability to do the job safely. Certification shall follow these requirements:

- a. Employees shall be considered certified by their employer when they:
 - (1) Complete the necessary formal or on-the-job training. The employer shall at least outline the on-the-job training needed, state the minimum number of hours required, and refresher training needed. Training shall include applicable requirements from 29 CFR 1910, "Occupational Safety and Health Standards," 29 CFR 1926, "Safety and Health Regulations for Construction," and applicable NASA and JSC requirements.
 - (2) Pass a written test.
 - (3) Get a certification card from their employer to document they have the required safety knowledge and skills. The certifying officer shall sign the card. Use JSC Form 353, Appendix D. Electronic systems that provide on-the-spot verification are also acceptable. See NPR 8715.3, "NASA Safety and Health Programs," paragraph 13.11 for more information.

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- b. The employer shall keep a record of employee certifications on JSC Form 209, “Application and Record of Qualification for Personnel Certification,” Appendix D, or a form or database containing the same information.
- c. Certifying officers shall:
 - (1) Know the requirements of the operation they will certify.
 - (2) Be at least one organizational level higher than the employee to be certified.
 - (3) Be appointed by the Center Director or his or her designated representative for civil servants, or the contract Project Manager or designated representative for contractors to certify Category I operations.
 - (4) Be appointed by a directorate-level official or representative from the organization or contractor responsible for the operations to certify Category II or III operations.
- d. Certification is good for 3 years, or less if necessary. The certifying officer and employer may request recertification or retesting:
 - (1) Any time they question an employee’s knowledge or skills.
 - (2) When an employee has to do any new hazardous operation.
- e. Have a physical examination when required by paragraphs 5.8.4 or 5.8.5 or by Occupational Health to be certified or recertified.

5.8.17. Exceptions to the requirements in paragraph 5.8.16 above

Certifications for operations other than the categories of hazardous operations mentioned in this chapter are exempt from the requirements of this chapter.

5.8.18. How an employee could lose certification

5.8.18.1 Employees will lose certification if they:

- a. Leave JSC or the company.
- b. Fail the recertification exam or fail to retain the required knowledge and skills.
- c. Are transferred or reassigned and no longer do the operations they were certified for.
- d. Fail to pass a required medical examination.
- e. Are past the recertification date.

5.8.19. Exclusions

The certification requirements of this chapter don’t cover:

- a. Operations that already require skill certification by quality assurance organizations, such as soldering, brazing, and welding.
- b. Certification of facilities and equipment.

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- c. Justification for hazardous duty pay, environmental differential pay, or premium pay. See part 10, subpart 2 of the JSC Personnel Handbook for information on hazardous duty or premium pay.

5.8.20. For more information on hazardous operations

- a. 29 CFR 1910.38, “Employee Emergency Plans and Fire Protection Plans”
- b. NPR 8715.3, Chapter 13.

5.8.21. Responsibilities for hazardous operations

- a. As a supervisor, you are responsible for:
 - (1) Obtaining, completing, and distributing required permits.
 - (2) Monitoring hazardous operations to make sure the requirements on the permit and in this chapter are followed for any hazardous operation.
 - (3) Providing detailed safety instructions for safe operations to employees who are authorized access to hazardous areas or who do hazardous operations.
 - (4) Identifying operations that could be hazardous. Analyze these operations to determine the risk to personnel, equipment, and facilities.
- b. As a JSC manager, you are responsible for:
 - (1) Making sure hazardous operations requiring certification are done only by employees with a valid certification.
 - (2) Managing a training and certification program for your organization. This includes providing all training and testing necessary to qualify your employees and certifying them after they show they have the necessary knowledge and skills.
 - (3) Keeping a master list of all operations requiring certified personnel, employees who are certified for those operations, certification examiners, and certification officers in your organization.
 - (4) Keeping completed certificates and supporting records current. Protect employee training records under NPD 1382.17 (current version), “NASA Privacy Policy.”
 - (5) Recommending candidates for certification examiners.
- c. As a safety representative, competent person, or certified confined space supervisor, you are responsible for reviewing each permit to make sure the requirements are followed and personnel listed on permits have valid and current certifications if required.
- d. As a contracting officer, you are responsible for making sure contracts contain hazardous operations requirements as necessary.
- e. The Safety and Test Operations Division is responsible for:
 - (1) Reviewing all operations being done at JSC or JSC field sites yearly to identify those that could be hazardous. Employee safety and health committees and employee representatives will help identify hazardous operations as requested.

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- (2) Monitoring JSC operations to make sure only certified personnel are assigned to the tasks described in this chapter.
- (3) Surveying selected areas to determine the effectiveness of the certification program.
- (4) Keeping metrics on the waivers and mishaps related to the waivers.
- f. Occupational Health is responsible for setting requirements for hazardous operations involving potential health hazards, sampling and monitoring environmental conditions, and providing professional medical support and surveillance as needed.
- g. The Employee Development Branch is responsible for providing training courses for hazardous operations as requested by management and the Safety and Test Operations Division. These courses shall qualify personnel for certification.