



**Johnson Space Center
Procedural
Requirements**

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Compliance is Mandatory

JSC SAFETY AND HEALTH HANDBOOK
Change 2 – May 2016

Responsible Office: Safety and Mission Assurance Directorate

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Change Record Log

Revision	Date	Originator	Description of Changes
Baseline, Revision G	8/1/1996	D. L. Clem, extension 34272	Change log was not maintained before Revision G
Change 1 to Rev G	11/14/1997	D. L. Clem, extension 34272	Adds process for reporting international mishaps, Chapter 106 Removes requirement for bicycle helmets, Chapter 203 Updates lifting requirements, Chapter 505
Administrative Changes	7/10/1998	D. L. Clem, extension 34272	Revises JSC Safety Policy per ESC direction
Change 2 to Rev G	8/6/1998	D. L. Clem, extension 34272	Updates safety committee structure, Changes time to serve on committees and allows for volunteer members, Chapter 114

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Revision H	2/3/1999	D. L. Clem, extension 34272	Includes upgrades from comparing JPG 1700.1 with NASA requirements Includes upgrades from comparing JPG 1700.1 with 29 CFR 1960 requirements Includes upgrades from comparing JPG 1700.1 with VPP and PEP requirements Includes other changes suggested by various JSC organizations
Change 1 to Rev H	3/1/1999	D. L. Clem, extension 34272	Update URL to on- line version and paragraph 5 Include JSC Safety Policy and rearrange chapter Update cross references Clarify "enough time" to "3 - 5 days before TRR"
Administrative Changes	7/1/2000	D. L. Clem, extension 34272	Changed "Job Safety Analysis" to "Job Hazard Analysis" to be consistent with Chapter 111.
Revision I	7/1/2002	D. L. Clem, extension 34272	Reorganizes program requirements around VPP elements. New Lockout/Tagout and Chemical alarm chapters. Updates to other chapters.
Change 1 to Rev I	11/7/2002	D. L. Clem, extension 34272	Changes to medical exam requirements, Chapter 3.6. Clarifies storage requirements, Chapter 5.1. Clarifies requirements for space heaters, Chapter 5.2 New safe work practices and design requirements, Chapter 6.8. Added responsibility for radiation equipment, Chapter 7.3. Changed Oxygen Enriched Atmosphere definition. Clarifies emergency number for the Sonny Carter Training Facility.
Change 2 to Rev I	5/11/2004	D. L. Clem, extension 34272	Changes to accommodate new Part 12, Chapter 5.7 Adds new Part 12, "Asbestos Control Requirements." This is a revision of the Asbestos Control Manual
Change 3 to Rev I	6/2/2005	D. L. Clem, extension 34272	Changed number to JPR 1700.1 New chapter on Weather Safety, Chapter 5.9 Updates emergency eyewash & shower requirements, Chapter 6.1 Updates emergency eyewash & shower requirements, Chapter 6.5 Updates emergency eyewash & shower requirements, Chapter 6.8 New chapter on breathing gases, Chapter 6.13

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			<p>Adds inspection program for forklifts & slings, eliminates duplicate requirements, Chapter 8.5, Appendix 8B</p> <p>Adds inspection program for power tools, Chapter 8.6</p> <p>Adds inspection program for ladders, Chapter 8.7</p> <p>Updates several hazardous material requirements, Chapter 9.1</p> <p>Updates several hazardous material requirements, Chapter 9.2</p> <p>Updates emergency eyewash & shower requirements, Chapter 10.1</p> <p>Clarifies applicability to JSC field sites, Part 12</p> <p>Removes advisory language and updates organizational titles & document numbers in several other chapters, Part 12</p>
Change 4 to Rev I	9/25/2006	D. L. Clem, extension 34272	<p>Adds reference to NASA Facility System Safety Guidebook, Chapter 2.4</p> <p>Updates mishap investigation products to reference NASA mishap reporting and investigation requirements, Chapter 2.7</p> <p>Adds requirement not to wear jewelry during maintenance or troubleshooting on any electrical or mechanical system, Chapter 5.2</p> <p>Revises processes for handling and disposing of batteries, Chapter 6.1</p> <p>Revises food safety requirements, Chapter 6.4</p> <p>Adds a requirement to test oxygen and oxygen enriched gas systems with oxygen or oxygen-enriched gas before introducing a human into the loop, Chapter 6.11</p> <p>Adds requirement to allow the Safety and Test Operations Division to waive cleanliness requirements, Chapter 6.13</p> <p>Adds construction safety requirements as a result of a mishap investigation and updates requirements for construction barriers, Chapter 10.1</p> <p>Adds provisions for a less-rigorous Use Readiness Review, Chapter 10.3</p> <p>Adds requirements for construction contracts as a result of a mishap investigation, Chapter 11.2</p>

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			<p>Updates the definition of “oxygen enriched” consistent with the changes to Chapter 6.11, Glossary</p> <p>Updates title of the Occupational Health Branch, several chapters</p>
Change 5 to Rev I	11/2/2007	D. L. Clem, extension 34272	Temporary change via JSC Announcement to update Lockout/Tagout requirements in Chapter 8.2, pending a complete revision of JPR 1700.1. Also deletes Attachment 8.2A and revises Attachment 8.2B of Appendix 8B.
Revision J	4/16/2008	D. L. Clem, extension 34272	Complete revision to several chapters
Change 1 to Rev J	6/1/2010	D. L. Clem, extension 34272	<p>Update process for getting prescription safety glasses.</p> <p>Updates to laser safety consistent with higher level requirements.</p> <p>Make physical exam requirements consistent with Chapter 3.6.</p> <p>Update to gas cylinder requirements</p>
Change 2 to Rev J	6/9/2011	D. L. Clem, extension 34272	<p>Change process for waivers and changing the handbook to be consistent with revised higher-level requirements, Chapter 1.4</p> <p>Revised list of required hazard analyses. Added clarification on verification methods. Clarified JHA content. Added list of approvals for hazard analyses. Clarified RAC criteria, Chapter 2.4</p> <p>Added reference to NPR 8705.6 for Headquarters audits, Chapter 2.5</p> <p>Added requirement to notify Headquarters of injury reports to OSHA, per NPR 8621.1 Made mishap levels consistent w/NPR 8621.1, Chapter 2.7</p> <p>Mishap levels consistent w/NPR 8621.1, Attachment 2.7D</p> <p>Added clarification to ensure feet are clear of floor obstacles and to contact Logistics for help with furniture, Chapter 5.2</p> <p>Updates to be consistent with NPR 8715.3. Includes hard requirement for written tests, adding SCBA certification, clarification of training for category III jobs, and clarification of work shift limitations, Chapter 5.8</p>

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			<p>New chapter describing JSC Automatic External Defibrillator program, Chapter 5.10</p> <p>Removed requirement for eyewash & shower for cryogenic areas. Chapter 6.5</p> <p>Assigned responsibility for annual audits to the Safety & Test Operations Division. Changed Med Ops Branch to Space Medicine Division, removed redundant requirements, Chapter 6.6</p> <p>Clarified requirements for operating procedures. Clarified that tests may proceed after TRR action item are complete. Revised time frame for submitting test documentation to Safety. Clarified mishap reporting requirements. Removed requirements for safety to sign detailed test procedures and to monitor physiological training. Added requirement for biosafety. Added reference to paragraph 1.14.2.b of NPR 8715.3 for offsite tests. Updated organizational titles and document numbers, Chapter 6.9</p> <p>Added requirements for controlled areas. Clarified defining of JSC space. Added other clarifications, Chapter 6.10</p> <p>Added clarification for commercial off-the-shelf flex hoses. Added clarification to requirements for gas cylinders, Chapter 6.11</p> <p>Added JSC Form 1023, Appendix 6A</p> <p>Clarified LO/TO exception for plug and cord electrical equipment, Chapter 8.2</p> <p>Removed reference to JPD 8719.1, Chapter 8.5</p> <p>Added requirement for training in the manufacturer's instructions, Chapter 8.6</p> <p>Added clarification that fall protection is not required for small jobs from ladders, Chapter 8.7</p> <p>Added URL for JSC list of restricted and prohibited chemicals, Chapter 9.1</p> <p>Deleted due to on-line list, Attachment 9.1A</p> <p>Updated document references, Chapter 9.5</p> <p>Clarified coverage of URRs and ORIs. Added flowchart for criteria on URRs and ORIs. Added other clarifications, Chapter 10.3</p> <p>Added clarification that Center-wide data is an acceptable means of maintaining facility baseline documentation, provided access methods are</p>
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			<p>included in general operating procedures. Moved list in Attachment 10.4A to web page, Chapter 10.4</p> <p>Clarified protective clothing for asbestos work, Chapter 12.5</p> <p>Clarified definition of and added qualifications for a "competent person," Chapter 12.7</p> <p>Added requirements for negative pressure enclosures, Chapter 12.9</p> <p>Reclassified some spot removal of asbestos. Added requirements for removing plaster or sheetrock ceilings below ceiling plenum, Chapter 12.15</p> <p>Updated to be consistent with requirements changes in asbestos chapters, Attachment 12A, 12B, 12D, 12E</p> <p>Replaced "Variance" with "Waiver." Added definition of Test Equipment," Revised mishap levels to be consistent with NPR 8621, Glossary</p>
Administrative Changes	11/13/2011	D. L. Clem, extension 34272	Updated URL in paragraph 3.a.4 & made grammatical correction, Chapter 12.15
Administrative Changes	3/6/2012	D. L. Clem, extension 34272	Replace appendix forms with JSC form numbers, Chapter 5.9, Appendix 5A & 5B
Administrative Changes	4/25/2012	D. L. Clem, extension 34272	Replace obsolete Ellington Field emergency number (x44444) with new emergency number (x33333) to match the emergency number at JSC and SCTF, Chapters 2.7, 3.6, 3.8, 5.8, 5.10, 5.10, 6.1, 6.5, 6.8, 6.10, 7.4, 8.1, 9.1, 9.3, 9.5, 10.1, 12.3, 12.14, Appendix 2B & 3B
Change 3 to Rev J	4/26/2012	D. L. Clem, extension 34272	<p>Corrected outdated references, Preface</p> <p>Added policy paragraph for commercial activities, Chapter 1.0</p> <p>Added option for use readiness review and reference to checklists, Chapter 2.3</p> <p>Updated process for investigation boards and added references to checklists, Chapter 2.7</p> <p>Updated office titles, updated emergency numbers, revised requirement for medical exams, Chapter 3.6</p> <p>Clarified SATERN record of evacuation drills and JF 2150, Chapter 4.4</p> <p>Added considerations for procedures and clarified certification card requirements. Removed limits to suited hard vacuum, Chapter 5.8</p>

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			<p>Changed “chest pains” to “heart attack symptoms, updated organization names and training requirements, Chapter 5.10</p> <p>Updated inspection schedules, Chapter 6.4</p> <p>Added considerations for handling process and references to checklists, Chapter 6.7</p> <p>Added visiting product vendors and requests for evaluation of radiation, Chapter 7.3</p> <p>Changed “Biosafety Control Board” to “Biosafety Review Board” and added requirements for the Board, Chapter 7.4</p> <p>Defined elements of JSC electrical safety program per NFPA 70E to address IFO audit findings. Added other references to NFPA 70E, Chapter 8.1</p> <p>Added “operational control” concept for non-LO/TO and referenced appendix. Added clarifications for tagout only, removing locks, group lockout, and training per IFO audit findings. Added provision for orange locks with red shrink wrap for high voltage, Chapter 8.2</p> <p>Clarified process for issuing locks and added attachment for Operational Control. Added prohibition against transporting hazardous materials in POVs or taking them into the office. Clarified transfer of hazardous materials. Added requirements for updating MSDSs and MSDS databases. Updated training requirements. Clarified responsibility for providing information, Appendix 8B</p> <p>Added requirement to ventilate pesticide areas for 10 minutes before entering, Chapter 9.3</p> <p>Changed Uniform Building Code to International Building Code. Clarified a “qualified electrical worker, Chapter 10.1</p> <p>Updated planning and conduct of asbestos operations, Chapter 12.1</p> <p>Added project design, Chapter 12.2</p> <p>Updated sampling requirements, Chapter 12.3</p> <p>Deleted incorrect document reference, Chapter 12.4</p> <p>Updated training requirements, to include offsite contractors, Chapter 12.5</p> <p>Added project design requirements, Chapter 12.6</p>
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			<p>Added requirements for Class III & Class VI competent persons, Chapter 12.7</p> <p>Updated sampling requirements and CFR references, Chapter 12.8</p> <p>Updated barrier requirements, Chapter 12.9</p> <p>Updated disposal instructions, Chapter 12.13</p> <p>Updated contact information for emergencies, Chapter 12.14</p> <p>Added project design. Updated Job Performance Requirements, Chapter 12.15</p> <p>Updated Job Performance Requirements. Added Attachment 12H for Custodial Work, Appendix 12B</p>
Administrative Changes	5/31/2012	D. L. Clem, extension 34272	<p>Updated document number of the JSC Emergency Preparedness Plan, Chapters 2.7, 3.8, 6.12, Appendix 1</p> <p>Updated asbestos definitions, Appendix 12B</p>
Revision K	11/25/2013	D. L. Clem, extension 34272	<p>Revised entire document</p> <p>Distributed chapter 1.0 among JPD 1700.3, chapter 1.1, and chapter 1.6</p> <p>Combined chapters 1.2 and 1.5 into chapter 1.1</p> <p>Combined chapters 1.3 and 1.6 into chapter 1.2</p> <p>Combined chapters 2.1 and 2.3 into chapter 2.1</p> <p>Combined chapters 4.2, 4.3, and 4.6 into chapter 4.1</p> <p>Added requirement for safety review of educational products in chapter 2.1.</p> <p>Added new chapter 8.8, "JSC's Fall Protection Program"</p> <p>Added new chapter 9.6, "Reproductive and Developmental Hazards"</p> <p>Added new chapter 9.7, "Working Safely with Nanotoxicology"</p>
Change 1 to Rev K	4/18/2014	D. L. Clem, extension 34272	<p>Chapter 3.8 – Revised responsibilities and measurements for Emergency Action Plans.</p> <p>Chapter 6.1 – Rewritten to conform with current best practices.</p>
Administrative Changes	11/21/14	D. L. Clem, extension 34272	<p>Chapter 2.1 – Updated links to checklists</p> <p>Chapter 2.4 – Added link to inspection checklists</p>

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			<p>Chapter 2.6 – Updated links to checklists and corrected cross references</p> <p>Chapter 3.5 – Corrected cross reference</p> <p>Chapter 6.2 – Corrected reference to NPR 8715.3</p> <p>Chapter 6.5 – Corrected cross reference</p> <p>Chapter 6.7 – Updated link to checklists</p> <p>Chapter 6.13 – Corrected cross reference & deleted outdated document reference</p> <p>Chapter 8.8 – Updated links to checklists</p> <p>Appendix A – Corrected mishap definitions to conform to NPR 8621.1</p> <p>Appendix F – Updated link to checklists in Attachment 2.6C</p>
Change 2 to Rev K	5/26/16	D. L. Clem, extension 34272	<p>Chapter 1.3 – Added requirement for the Director, Health and Human Performance to concur on health-related requirements and health-related waivers.</p> <p>Combined chapters 11.1 and 11.2 into chapter 1.5; Moved “how-to” material to a guidance document.</p> <p>Chapter 1.7 – Clarified JSC, SCTF, and Ellington Field as separate sites under OSHA VPP. Added responsibility for annual report to OSHA and NPR references.</p> <p>Chapter 2.6 – Added clarification on classifying mishaps; Changed reference to JF 1627.</p> <p>Chapter 3.4 – Removed audit requirement.</p> <p>Chapter 3.5 – Removed audit requirement.</p> <p>Chapter 5.2 – Clarified that power strips are only designed for use with a high concentration of low-powered loads.</p> <p>6.10 – Added reference to OSHA construction requirements (29 CFR 1926, Subpart AA).</p> <p>8.2 – Added requirement to test test equipment for proper operation immediately before and immediately after testing a circuit.</p> <p>8.8 – Added clarifications on fall protection equipment, training, and rescue.</p> <p>9.5 – Added exceptions to hazardous operations permits. Added requirements for inventory, compliance audits, unserviceable pyrotechnics, transportation, and certification. Added</p>

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			<p>responsibilities for WSTF and pyrotechnic safety officers, and clarified other responsibilities.</p> <p>10.4 – Provided flexibility by requiring a readiness review (ORI or URR) to determine the baseline documentation necessary for the facility. Changed “Baseline” to “Safety Management Process.”</p> <p>Chapters 11.1 & 11.2 – Marked reserved.</p> <p>Chapter 12.1 – Clarified asbestos activities; Updated cross-references; Updated link to JSC Asbestos Tool; Updated pickup information.</p> <p>Chapter 12.3 – Updated cross-references.</p> <p>Chapter 12.5 – Updated training requirements, Added requirement for JSC Specific training for Class I, II, & III asbestos work on site.</p> <p>Chapter 12.6 – Updated cross-references.</p> <p>Chapter 12.7 – Clarified requirements for JSC specific training; Updated cross-references.</p> <p>Chapter 12.8 – Updated cross-references.</p> <p>Chapter 12.13 – Updated the disposal process.</p> <p>Chapter 12.14 – Updated emergency contacts.</p> <p>Chapter 12.15 – Updated cross-references and links.</p> <p>Moved Job-Specific Performance Requirements from attachments 12A – 12G, Appendix F to new chapter 12.16. Attachments deleted from Appendix F.</p> <p>Appendix A – Added definitions for JSC Team Member, Line Manager, Line Organization, Supervisor.</p> <p>Appendix F, Attachment 8.2B – Removed audit requirement.</p> <p>Deleted Attachment 11.1A from Appendix F.</p>
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PREFACE

Title: JSC Safety and Health Handbook

P.1 PURPOSE

This document defines JSC's Safety and Health Program and provides basic safety and health requirements for the Johnson Space Center (JSC) and for other locations under JSC's jurisdiction. It is important that you follow the safety and health requirements that apply to your job.

P.2 APPLICABILITY

This handbook applies to anyone at JSC or JSC field sites, unless exempted in a specific chapter. For this handbook, "JSC" includes all JSC sites in the Houston area such as Ellington Field and the Sonny Carter Training Facility. "JSC field sites" are sites under JSC control outside the Houston area, such as the White Sands Test Facility and El Paso Forward Operating Location. The handbook applies to operations involving JSC personnel or equipment at non-JSC locations, including foreign countries. See Chapter 1.3, paragraph 6, for more information on following standards at non-JSC locations. This handbook applies to other contractors, grant recipients, or parties to agreements only to the extent specified or referenced in the appropriate contracts, grants, or agreements

- a. In this handbook, all mandatory actions (i.e., requirements) are denoted by statements containing the term "shall." The terms: "may" or "can" denote discretionary privilege or permission, "should" denotes a good practice and is recommended, but not required, "will" denotes expected outcome, and "are/is" denotes descriptive material.
- b. In this handbook, all document citations are assumed to be the latest version unless otherwise noted.
- c. The following table tells you who must follow this handbook.

<i>If you . . .</i>	<i>Then you shall follow . . .</i>
Are a NASA civil service employee	This handbook unless you work at a site that involves unique military equipment and operations
Are a contractor at JSC	This handbook as called out in your contract. Prime contractors must flow down these requirements to subcontractors
Work at a JSC field site as a civil service employee or contractor employee	All chapters that don't exempt you and local requirements that meet the intent of any chapter that exempts you If a chapter exempts you, develop your own requirements that meet the intent of that chapter The local Safety and Mission Assurance Office or equivalent carries out the responsibilities of the Safety and Test Operations Division at your site
Are a non-NASA or non-contract employee	This handbook while you are on JSC property

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- d. If you are a federal employee working in a private employer’s facility, you are covered by the JSC safety and health program. Although NASA may not have the authority to correct hazardous conditions in a private sector workplace, NASA makes sure your working conditions are safe and healthful. NASA does this by administrative controls or personal protective equipment, or your withdrawal from the private employer’s facility.
- e. If you are a private employer, neither Executive Order 12196, “Occupational Safety and Health Programs for Federal Employees,” nor this handbook relieves you or your employees of any rights or responsibilities under the Occupational Safety and Health Administration (OSHA).
- f. This Handbook takes precedence over all other JSC documentation in safety and health, except for more stringent requirements that individual JSC organizations develop. The following requirements apply:
 - (1) If your organization has more stringent requirements than are in this Handbook, you shall follow them.
 - (2) In the case of differences between the requirements of this Handbook and other NASA, federal, state, or local requirements, you shall follow the more stringent requirements.
 - (3) If you find any less stringent JSC requirements than are in this Handbook, or any differences between the requirements of this Handbook and other NASA, federal, state, or local requirements, bring them to the immediate attention of the JSC Director, the Safety and Mission Assurance Directorate, or the Human Health and Performance Directorate.
- g. You don’t need to read this entire Handbook. You need to be familiar with the elements of JSC’s safety and health program, and the requirements that apply to your job. Use the Handbook to find specific requirements, as you need them. This Handbook contains several features to help you find the requirements you need:
 - (1) Table of contents
 - (2) Subject index
 - (3) Chapter titles
 - (4) Chapter introductions that tell you who has to follow that chapter
 - (5) The table below tells you which parts apply to what jobs:

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If your job or facility operations involve . . .

Then you shall follow . . .

Any work at JSC or JSC field sites	Part 5, Safety and health practices for everyone
Working with batteries	Part 6, Safety and health requirements for certain hazardous tasks
Working with lasers	
Working in warehouses	
Preparing or serving food	
Working with cryogenic liquids or gases	
Handling new or unique hardware	
Working in chemical or research laboratories	
Doing test operations	
Entering confined spaces or controlled areas	
Working with compressed gases or breathing gases	
Use chemical alarms in your work area	Part 7, Health protection practices
Working in noisy areas	
Wearing a respirator	
Working with ionizing or nonionizing radiation	
Coming in contact with biohazards, blood, or body fluids	Part 8, Safety and health practices for manufacturing, installation, repair, and maintenance
Working in machine shops	
Working with electricity	
Welding, cutting, or brazing	
Lifting materials	
Working with hand or power tools	
Working on ladders, scaffolds, or elevated platforms	Part 9, Safety and health practices for hazardous materials
Working where fall protection is required	
Working with or transporting hazardous materials	Part 10, Safety and health practices for JSC facilities and facility systems
Designing or constructing JSC facilities	
Operating hazardous or complex facilities	Part 11, Safety and health requirements for JSC contracts and purchases
Overseeing contracts or grants at JSC	
Participating on a Source Evaluation Board	Part 12, Asbestos Control Requirements
Working near or with asbestos-containing materials	

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P.3 AUTHORITY

JPD 1700.3, "JSC Safety and Health Policy"

P.4 APPLICABLE DOCUMENTS AND FORMS

The numerous references cited throughout the Handbook are listed found in Appendix C. The numerous forms referenced are listed in Appendix D.

P.5 MEASUREMENT/VERIFICATION:

Measurements of various items addressed in the Handbook are listed in individual chapters.

P.6 CANCELLATION:

This handbook replaces JPR 1700.1J.

Approved:
Original Signed by

William S. McArthur
Director, Safety and Mission Assurance

Distribution:
JDMS