

MWI 8715.3
REVISION C

EFFECTIVE DATE: September 10, 2004
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MARSHALL WORK INSTRUCTION

QD01

HAZARD WARNING SIGNS AND BARRICADES

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DOCUMENT HISTORY LOG

Status (Baseline/ Revision/ Canceled)	Document Revision	Effective Date	Description
Baseline		12/13/99	
Revision	A	5/15/01	<p>Renumbered document in accordance with MPG 1410.2; changed Purpose to read "This document establishes the requirements for a uniform visual system and an effective means of communicating information to the employee so that injury related to potential hazards in the work environment at MSFC can be avoided"; added MWI 8715.2 and ANSI Z535.1-1991 to section 3; added 4.2 through 4.4; added 5.1, 5.2, 5.2.1, 5.3.1, 5.4, 5.4.1 & 5.4.2, 5-5.5.2, 5.6, 5.7, 5.8, 5.9, 5.10.1, 5.11-5.17, 5.19, 5.20, 5.22, 5.23, 5.25, and 5.26; revised 5.1 to read "...or path to identify and restrict..."; revised 5.3 to read "Biological Hazard Signs/Tags. These signs and tags shall...containers, material, and rooms...with viable hazardous..."; revised 5.4 to read "Caution Signs/Tags. These signs and tags are used to indicate potentially minor hazardous situations that, if not avoided, may result in minor or moderate injury. These signs or tags may also be used to call...practices. Caution tags shall...injury. Caution tags are used for property damage only mishaps"; revised 5.5 to read "Danger Signs/Tags. These signs or tags shall be used to indicate imminently major hazard situations that, if not avoided, will result in death...Danger tags should not be considered for property damage mishaps unless personal injury risk appropriate to this level is also involved"; revised 5.10 to read "Notice Signs/Tags. These signs and tags are used to indicate a statement or company policy or indirectly relate...These signs or tags are not..."; deleted paragraph "5.f"; revised 5.12 to read "...These signs are a visual alerting device that advises the observer of the nature and degree of the potential hazard(s) that can cause injury or death. It can also provide safety precautions, general instructions relative to safety work practices, reminders or proper safety procedures, evasive actions to take, or provide other directions to eliminate or reduce the hazard"; revised 5.15 to read "Warning Signs/Tags. These signs and tags shall be used to indicate a potentially hazardous situation that, if not avoided, could result in death or serious injury. Warning tags should not be considered for property damage accidents unless personal injury risk appropriate to this level is also involved"; deleted "5.i"; revised paragraph 6 NOTE to read "SIGNS, TAGS, AND BARRICADES"; revised 6.1 to read "...supervisors, or building managers shall...danger signs and tags as a means of...an area that is restricted or considered hazardous or unsafe...'Specifications for Accident Prevention Signs and Tags,' 29 CFR 1926.200, 'Accident Prevention Signs and Tags,' 29 CFR 1926.202, 'Barricades,' and ANSI Z535.1, 'Safety</p>

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			<p>Color Code'"; added 6.2; revised 6.3 to read "When an employee recognizes a...shall notify the area supervisor and/or building manager of the hazard or unsafe condition"; revised 6.4 to read "The area supervisor and/or building manager shall evaluate the hazard or unsafe condition, secure the area if required and inform any affected employees of the hazard or unsafe..."; added 6.5; revised 6.6 to read "The area supervisor and/or building manager shall indicate any actions necessary to correct the hazardous or unsafe..."; added 6.7; deleted section 6.e; added 6.8 through 6.9.5; revised 6.9.9 to read "...Department (EED) and/or the Occupational Medicine and Environmental Health Services (OMEHS) representative"; revised 6.10.1 to read "...placed by any organization to identify and/or deny access to hazardous areas...unsafe areas and comply with section 5 (definitions) and the following:"; changed 6.10.3 to read "Physical barricades used shall be constructed of a physical means such as a wooden structure, orange polyethylene fencing with the grid or diamond mesh design or similar"; added 6.10.4 through 6.10.6; added "PSD" to 6.10.7; added records under section 9; and added "This training may be accomplished by reviewing this MWI during a group safety meeting. This training will be required every 2 years" to section 10.</p>
Revision	B	5/6/2004	Major rewrite
Revision	C	9/10/2004	Major rewrite in accordance with HQ rules review, added sections 5.15, 6.10 & 6.13.

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1. PURPOSE

This instruction establishes the requirements for a uniform visual system for identifying/markings potential hazards, and provides an effective means of communicating hazard information to the employees, in order to reduce the likelihood of injury from potential hazards in the Marshall Space Flight Center (MSFC) work environment

This instruction defines the types of signs, tags, and barricades to be used in controlling exposure to potential hazards, and specifies requirements for design uniformity to promote employee recognition and avoidance of hazards.

2. APPLICABILITY

This instruction applies to all MSFC controlled facilities and operations.

3. APPLICABLE DOCUMENTS

- 3.1 29 CFR 1910.145, "Specifications for Accident Prevention Signs and Tags"
- 3.2 29 CFR 1910.1200, "Hazard Communication"
- 3.3 ANSI Z136.1, "American National Standard For the Safe Use of Lasers"
- 3.4 ANSI Z535.1, "Safety Color Code"
- 3.5 ASME A13.1, "Scheme for the Identification of Piping Systems"
- 3.6 MPR 1840.2, "MSFC Hazard Communication Program."
- 3.7 MPD 1860.1, "Laser Safety"
- 3.8 MPD 1860.2, "Radiation Safety Program"
- 3.9 MWI 8715.2, "Lockout/Tagout Program"
- 3.10 NPR 1441.1, "NASA Records Retention Schedule" (NRRS)

4. REFERENCES

- 4.1 29 CFR 1910.144, "Safety color code for marking physical hazards"
- 4.2 29 CFR 1926.200, "Accident Prevention Signs and Tags"
- 4.3 29 CFR 1926.202, "Barricades"

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- 4.4 ANSI Z535.1, “Safety Color Code”
- 4.5 ANSI Z535.2, “Environmental and Facility Safety Signs”
- 4.6 ANSI Z535.3, “Criteria for Safety Symbols”
- 4.7 ANSI Z535.5, “Accident Prevention Tags (For Temporary Hazards)”
- 4.8 MPR 1840.3, “MSFC Hazardous Chemicals in Laboratories Protection Program”
- 4.9 NPR 8715.3, “NASA Safety Manual”

5. DEFINITIONS

5.1 Barricade. A physical barrier placed across a path of travel to identify and restrict persons and/or vehicles from passing through and accessing hazardous areas or locations.

5.2 Barricade Tape. Tape, red or yellow in color, installed to communicate the need for caution or warn of danger. Tape may be imprinted with hazard specific symbols or text. Barricade tape is not categorized as a physical barrier.

5.3 Biological Hazard or Biohazard. Infectious agents presenting a risk of death, injury, or illness to employees.

5.4 Biological Hazard Signs/Tags. Signs and tags installed to identify the actual or potential presence of a biological hazard, and to identify equipment, containers, material, and rooms that contain or are contaminated with viable hazardous biological agents. Also referred to as “biohazard” signs/tags.

5.5 Caution Signs/Tags. Signs and tags installed to call attention to potentially minor hazards and/unsafe practices which, if not avoided, could result in injuries with severity ranging from minor to moderate or property damage

5.6 Danger Signs/Tags. Signs and tags installed to call attention to potentially major hazards that, if not avoided, could result in injuries with severity that range from serious to fatal. Use of these hazard warnings is mandatory where conditions expose personnel to imminent danger. Danger tags can also be used in association with mishap scenes, including property damage incidents, which expose personnel to risks of serious or fatal injury.

5.7 Fire Safety Signs. Signs installed to indicate the location of emergency fire fighting equipment.

5.8 Label or Placard. A visual alerting device installed to communicate the nature of degree of a potential hazard. It can also describe safety precautions or evasive actions to take, or

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provide directions on reducing or eliminating the hazard. Can take the form of a decal, or markings created by embossing, stamping, etching, or other manufacturing process.

5.9 Hazardous Materials Information System (HMIS). A system that uses standard labels to communicate hazards through the use of colors, numbers, letters of the alphabet, and symbols. The HMIS provides identification of the chemical, acute health hazard, flammability, reactivity, personal protective equipment requirements, and chronic health hazard information.

5.10 Lockout/Tagout Tags. Tags installed to communicate a warning against actuation or re-energization of a powered system, machine, or equipment item, due to the potential for serious to fatal injury of personnel performing service or maintenance tasks on the equipment in question. Lockout/Tagout tags can also be referred to as “tagout devices.” Reference MWI 8715.2, “Lockout/Tagout Program,” for more information.

5.11 Major Message. That portion of a tag’s inscription that is more specific than the signal word and that indicates the specific hazardous condition or instruction to be communicated to the employee. Examples include: “High Voltage”, “Close Clearance”, “Do Not Start”, or “Do Not Use”, or a corresponding pictograph used with a written text or alone.

5.12 Message Panel. That portion of the sign, label, or tag containing written text to identify the hazard, tell how to avoid the hazard, and/or indicate the probable consequence(s) of exposure to the hazard. The panel can include a hazard symbol or a pictograph, as well.

5.13 Mishap. Any unexpected occurrence, event, or sequence of events that result in injury or death to employees or visitors or damage to NASA equipment or property.

5.14 Mishap Prevention Tag. All accident prevention tags are installed to identify hazardous conditions and provide a message to employees with respect to hazardous conditions, or to meet the specific tagging requirements of OSHA standards.

5.15 National Fire Protection Association (NFPA) 704 label. A system that uses a color-coded diamond with four quadrants in which numbers are used in the upper three quadrants to signal the degree of emergency health hazard (blue), fire hazard (red), and reactivity hazard (yellow). The bottom quadrant is used to indicate water reactivity, radioactivity, biohazards, or other special hazards.

5.16 Notice Signs/Tags. Signs and tags are installed to communicate a statement of MSFC or company policy, or messages indirectly relate to the safety of personnel or protection of property.

5.17 Panel. A portion of a sign, label, or tag having a distinctive background color different from adjacent areas, or being clearly delineated by a line, border, or margin. Signs, labels, and tags can have up to three (3) panels: signal word, message, and symbol. Signs, labels, and tags have either a message panel or a symbol/pictorial panel.

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5.18 Pictograph. A pictorial representation used to identify a hazardous condition or to convey a safety instruction.

5.19 Radiation Signs/Tags. Signs and tags installed to identify areas where sources of radiation are or can be present.

5.20 Safety Alert Symbol. Symbol used to indicate text identifying a potential personnel injury hazard, composed of an equilateral triangle surrounding an exclamation point. This symbol is not used to alert personnel to potential property damage hazards only.

5.21 Safety Instruction Signs. Signs installed where there is a need for general instructions and suggestions relative to safety measures (e.g., safety precautions, safe work practices or instructions for hazard avoidance, reduction, or elimination).

5.22 Sign. A surface prepared with imprinted text, symbols, and/or colors for the warning of, or safety instruction of, industrial workers or members of the public who may be exposed to hazards. Excluded from this definition, however, are news releases, displays commonly known as safety posters, and bulletins used for employee education.

5.23 Signal Word. That portion of a sign or tag bearing an inscription containing a word or phrase intended to capture the employee's immediate attention. Signal words typically convey the degree or level of hazard awareness and attention to safety required of the employee (e.g., Caution, Danger, Notice, or Warning). Signal words are always imprinted in a distinctive panel located in the uppermost portion of a sign or tag.

5.24 Signals. Moving signs, provided by workers such as flagmen, or by devices such as flashing lights, to warn of possible or existing hazards.

5.25 Safety color code for marking physical hazards. OSHA specifications are to use red and yellow to communicate the presence of physical hazards. At MSFC yellow is commonly used to warn employees of the presence of any physical hazard.

5.26 Symbol/Pictorial Panel. That portion of a sign or tag bearing a graphic representation intended to convey a message without use of words. The imprint can represent a hazard category, hazard avoidance action, consequence or exposure to a hazard, or a combination of these. The pane can also be combined with a text message, as well.

5.27 Tag. A device used to identify a hazardous condition, usually made of card, paper, pasteboard, plastic, or other material. In the construction industry, a temporary sign, usually attached to a piece of equipment or part of a structure to warn of existing or immediate hazards.

5.28 Warning Signs/Tags. Signs and tags installed to represent hazard level greater than that indicated by "Caution" signal word, but less than that indicated by "Danger" signs/tags. Warning tags can be used in association with mishap scenes, including property damage incidents that expose personnel to risks of this magnitude.

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6. INSTRUCTIONS

NOTE: SIGNS, TAGS, AND BARRICADES ARE NOT CONSIDERED AS A COMPLETE WARNING METHOD, BUT SHALL BE USED TO HELP COMMUNICATE HAZARDOUS CONDITIONS. THE MARKING OF A PHYSICAL HAZARD BY A STANDARD COLOR WARNING SHOULD NEVER BE ACCEPTED AS A SUBSTITUTE FOR THE REDUCTION OR ELIMINATION OF THE HAZARD.

6.1 This MWI provides specifications for the design, application, and use of barricades, signs, tags, and symbols intended to indicate and define specific hazards. This instruction defines a systematic approach to using these devices to effectively communicate information concerning potential hazards to all MSFC workers and visitors. This communication system addresses hazards which, if unrecognized, could lead to accidental injury to workers and/or visitors, or to property damage.

6.2 Any employee may post or hang the appropriate sign, tag, or barricade if the hazardous or unsafe condition cannot be corrected. The sign or tag shall contain the appropriate signal word and/or message or symbol/pictorial panel for the potentially hazardous or unsafe condition in accordance with section 5 (Definitions).

6.3 Safety signs and tags may be purchased from the MSFC Retail Store or contact the Industrial Safety Department (ISD) for a list of vendors.

6.4 All new and all replacement signs and tags shall meet these specifications, unless the sign or tag requirements for a specific operation, process, or material are addressed in another specification or instruction.

6.5 Due to the critical importance of consistency and uniformity in establishing and maintaining an effective hazard notification system compliance is mandatory in all MSFC facilities, and in all operations performed under MSFC control.

6.5.1 The responsible MSFC directorate or office shall assure all contractors/ subcontractors under their direction obtain and use compliant notification devices when needed.

6.5.2 All personnel working on site at MSFC shall use the specified signs, labels, placards, and tags in compliance with the hazard notification system defined in this MWI. These devices shall be used to inform others of potentially hazardous conditions, equipment, and operations involving tools, equipment, materials, and processes that could become unsafe. Barricades shall be utilized to designate potentially hazardous areas where safety depends on limiting access to authorized competent personnel only.

6.6 Hazardous Notification System

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6.6.1 The installation of barricades and/or warning signs and tags shall only be used as the initial step in the MSFC hazard notification process.

6.6.2 Any employee who identifies a potentially hazardous condition at MSFC, which cannot be corrected on the spot, is authorized to install an appropriate sign, label, placard, tag, or barricade in accordance with this MWI.

6.6.3 The employee shall immediately notify the supervisor(s) responsible for the work areas in the vicinity of the hazardous condition, and the responsible building manager. Responsibility for building manager notification may be transferred to a supervisor, provided that transfer of responsibility is agreed upon.

6.6.4 The responsible area supervisor(s) and/or building manager(s) shall visually examine and evaluate the potentially hazardous condition. If the condition cannot be eliminated they shall complete the following additional hazard notification actions:

6.6.4.1 Secure the areas, if appropriate, using a barricade and/or other appropriate methods of deterring personnel access to the potentially hazardous condition.

NOTE: Barricade tape shall be used as a temporary means of barricading a potential hazard, until a physical barricade can be erected.

6.6.4.2 Install additional hazard warning signs, labels, placards, or tags, as needed to effectively communicate the hazard warning. The signs, labels, placard, or tags shall be affixed as close as safely possible to their respective hazards, by a positive means such as a string, wire, or adhesive that prevents their loss or unintentional removal.

6.6.4.3 All tags installed shall contain the person's name and phone number who placed the tag.

6.6.4.4 The person, or their designee, that placed the tag to identify the hazard shall remove the tag after the hazard has been corrected.

6.6.4.5 Verbally inform all affected employees of the potentially hazardous condition, and special safety precautions to be implemented (if any).

6.6.4.6 Take appropriate action to effectively communicate the hazard warning to all employees who may encounter the potentially hazardous condition.

6.6.4.7 Initiate action to have the potentially hazardous condition corrected, or permanent access controls and warnings installed, as appropriate to the circumstances.

6.6.4.8 When the potentially hazardous condition has been corrected or permanently controlled, remove barricades, signs, labels, placards, and tags that were installed to identify and draw attention to the hazard. In some cases, more permanent versions of these devices may be

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installed as components of a permanent hazard control strategy. All tags shall have the person's name and phone number who placed the tag.

6.6.4.9 If additional help or assistance is needed contact the Industrial Safety Department.

6.7 Marking of physical hazards with standard color warnings is not an acceptable substitute for the reduction or elimination of the hazard. Engineering and/or administrative controls, in combination with procedural training, should be utilized to eliminate or reduce hazards whenever feasible; any remaining hazard should be marked in accordance with this MWI.

6.8 Personnel are strongly encouraged to consult with the MSFC Industrial Safety Department (ISD) and/or Occupational Medicine and Environmental Health Services (OMEHS) for assistance in evaluating potentially hazardous conditions, and determining appropriate control measures to be implemented. This is particularly important in situations where the attempt to devise a strategy for eliminating the hazard has not been successful.

6.9 All employees shall be informed as to the meaning of the various tags used throughout the workplace and what special precautions are necessary.

6.10 MSFC Specifications for Hazard Notification Signs, Tags, and Barricades.

6.10.1 General Sign Specifications

6.10.1.1 All signs shall be furnished with rounded or blunt corners and free from sharp edges, burrs, splinters, or other sharp projections. The ends or heads of bolts on other fastening devices shall be located in such a way that they do not constitute a hazard.

6.10.1.2 The wording of any sign shall be concise and easily read at a minimum distance of 5 feet, or a greater distance as warranted by the nature of the hazard. The sign shall contain sufficient information to be easily understood by all persons who may be exposed to the identified hazard. The wording shall make a positive, rather than negative suggestion and should be accurate in fact.

6.10.2 General Tag Specifications: All required tags shall meet the following criteria:

6.10.2.1 Tags shall contain a signal word and a major message.

6.10.2.1 The signal word shall be either "DANGER", "WARNING", "CAUTION", "BIOLOGICAL HAZARD", "BIOHAZARD", the biological hazard symbol, or "NOTICE".

6.10.2.2 The major message shall indicate the specific hazardous condition or the instruction to be communicated to the employee.

6.10.2.3 The signal word shall be readable at a minimum distance of 5 feet or a greater distance as warranted by the nature of the hazard.

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6.10.2.4 The tag’s major message shall be presented in either pictographs, written text or both.

6.10.2.5 The signal word and the major message shall be understandable to all employees who may be exposed to the identified hazard.

6.10.2.6 Mishap (accident) prevention tags shall have letters, markings, symbols, or a combination thereof, to effectively indicate the presence of a temporary hazard. These devices may be made of card stock, paperboard, plastic, or other imprinted material. Tags shall be attached by string or wire, and shall be removed when the hazardous condition no longer exists.

6.10.3 Danger Signs and Tags

6.10.3.1 Danger signs shall have the signal word “DANGER” in white letters on a red oval background with a white border, within a black rectangular background located in the uppermost portion of the sign. No other signal word or symbol shall be used within the distinctive color and shape arrangement. The symbol panel, if used, shall be square having a black or red symbol on a white background, or a white symbol on a red background. The message panel shall be printed in black or red letters on a white background.

6.10.3.2 Danger sign colors of red, black, and white shall be those of opaque glossy samples as specified in ANSI Z353.1, Table 1, “Fundamental Specification of Safety Colors for CIE Illuminant C.”

6.10.3.3 Danger tags shall have the signal word “DANGER” imprinted in white letters on a red oval background, within in a black rectangular background located near the top of the tag.

6.10.3.4 Danger signs and tags may vary slightly in design depending on the manufacturer.

6.10.3.5 Danger signs and tags shall only be used in situations where an immediate hazard exists and presents a threat of death or serious injury to employees.

6.10.4 Caution Signs and Tags

6.10.4.1 Caution signs shall have the signal word “CAUTION” printed in yellow letters within a black rectangular background located in the uppermost portion of the sign. This distinctive color and signal shape arrangement shall be reserved for caution signs only. The symbol pattern, if used, shall be square with the black symbol printed on a yellow background. The message panel shall be printed in black letters on a yellow background.

6.10.4.2 Caution sign colors shall be those of opaque glossy samples specified in ANSI Z353.1, Table 1, “Fundamental Specification of Safety Colors for CIE Illuminant C.”

6.10.4.3 Caution tags shall have the signal word “CAUTION” printed in yellow letters within a black rectangular background located near the top of the tag.

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6.10.4.4 Caution signs and tags may vary slightly in design depending on the manufacturer.

6.10.4.5 Caution signs and tags shall be used in minor hazard situations where a non-immediate or potential hazard or unsafe practice presents a lesser threat of employee injury.

6.10.4.6 Caution tags shall not be used when there is any potential for death or severe injury, reference 5.6 for the appropriate sign/tag.

6.10.5 Warning Signs and Tags

6.10.5.1 Warning signs shall have signal word “WARNING” printed in black letters on an orange truncated diamond, within a black background located on the uppermost portion of the sign. No other word or symbol shall be used with this distinctive shape or color arrangement. The symbol panel, if used, shall be a square with a black symbol on an orange background. The message panel shall contain an appropriate major message printed in black letters on a orange background.

6.10.5.2 Warning sign colors shall be those of opaque glossy samples specified in ANSI Z353.1, Table 1, “Fundamental Specification of Safety Colors for CIE Illuminant C.”

6.10.5.3 Warning tags shall have the signal word “WARNING” printed in black letters on an orange truncated diamond, within a black rectangular background, or on an orange rectangular background delineated with a black border. The signal panel shall be located on the uppermost portion of the tag.

6.10.5.4 Warning signs and tags may vary slightly in design depending on the manufacturer.

6.10.6 Notice Signs and Tags

6.10.6.1 Notice Signs and tags shall have the signal word “NOTICE” printed in white letters on a blue rectangular background located in the uppermost portion of the sign or tag. No other signal work or symbol shall be used within this distinctive shape or color arrangement. The symbol panel, if used, shall be square with a blue or black symbol on a white background, or white symbol on a blue background. The message panel shall be imprinted with blue or black letters on a white background.

6.10.6.2 Notice sign colors shall be those of opaque glossy samples specified in ANSI Z353.1, Table 1, “Fundamental Specification of Safety Colors for CIE Illuminant C.”

6.10.6.3 Notice signs and tags may vary slightly in design depending on the manufacturer.

6.10.6.4 Notice signs and tags shall be used to provide general information.

6.10.7 Biohazard Signs and Tags

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6.10.7.1 Biohazard signs and tags shall have a signal word “BIOHAZARD” located near the top of the sign or tag. Use of the biological symbol is optional, as long as there is sufficient contrast for the symbol to be clearly defined. The symbol color shall be a fluorescent orange or orange-red. There is no standard color for lettering or background; however there must be sufficient contrast between the lettering and the sign or tag background to make the imprinted symbol or lettering legible.

6.10.7.2 The symbol design for biological hazard signs and tags shall conform to the design specification of 29 CFR 1910.145 (f)(8)(ii).

6.10.7.3 Biohazard signs and tags may vary slightly in design depending on the manufacturer.

6.10.7.4 Biohazard signs and tags shall be used to identify the actual or potential presence of a biological hazard and to identify equipment containers, rooms, materials, experimental animals, or combination thereof, which contain, or are contaminated with hazardous biological agents. This shall also include infectious agents presenting a risk or potential risk to the well being of humans.

6.10.8 Radiation Signs and Tags

6.10.8.1 Radiation signs and tags shall have the signal word “RADIATION” printed in reddish purple (magenta) panel with yellow letters on a yellow background located in the uppermost portion of the sign or tag. The symbol panel shall have the standard reddish purple (magenta) abstract three bladed object with one blade pointed downward and centered on the vertical axis. The standard symbol shall be a reddish purple on a yellow background. The message panel shall be imprinted with black letters on a yellow background.

6.10.8.2 Radiation signs and tags may vary slightly in design depending on the manufacturer.

6.10.8.3 Radiation signs and tags shall be used to identify the presence of a radiation hazards and to identify equipment, containers, rooms, or a combination thereof, that contain or are contaminated with hazardous radiation hazards. Reference MPD 1860.2 “Radiation Safety Program”.

6.10.9 Safety Instruction Signs

6.10.9.1 Safety instruction sign shall have a signal word conveying general safety messages printed in white letters on a green rectangular background located in the uppermost portion of the sign. The signal words “DANGER”, “CAUTION”, “WARNING”, “NOTICE” shall not be used on these signs. The symbol panel, if used, shall be square with a green symbol on a white background, or a black symbol on a white background having a green border. The message panel shall be imprinted with green or black letters on a white background.

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6.10.9.2 Safety Instruction sign colors shall be those of opaque glossy samples specified in ANSI Z353.1, Table 1, “Fundamental Specification of Safety Colors for CIE Illuminant C.”

6.10.9.3 Safety Instruction sign shall be used where there is a need for general instructions and suggestions relative to safety measures.

6.10.9.4 Safety Instruction signs shall not use “Danger”, “Warning”, or “Caution” as signal words, and shall not be installed where this MWI requires use of danger, warning, or caution signs.

6.10.10 Slow Moving Vehicle Emblems and Placards

6.10.10.1 Slow moving vehicle (SMV) emblem consists of a fluorescent yellow-orange triangle, with a dark red reflective border. The yellow-orange fluorescent triangle is a highly visible color for daylight exposure. The reflective border defines the shape of the fluorescent color in daylight, and creates a hollow red triangle in the path of motor vehicle headlights at night. Neither the color film pattern and its dimensions nor the backing shall be altered to permit use of advertising or other markings. The SMV emblem will be constructed of a rustproof and waterproof material of sufficient thickness to assure a permanent flat surface and allow permanent adhesion of pressure-sensitive materials.

6.10.10.2 The SMV Emblem shall be mounted pointing upward, 3 to 5 feet above the ground, on the center rear of the vehicle or as near left center as possible.

6.10.10.3 The orange fluorescent pressure-sensitive material in the center of the SMV Emblem shall be replaced when it is no longer visible in normal sunlight for a distance of 500 feet. The red reflective pressure sensitive material on the border of the SMV Emblem shall be replaced when it is no longer visible at night from a distance of 500 feet when illuminated by the lower beam of motor vehicle headlights.

6.10.10.4 The SMV Emblem shall be used on horse drawn vehicles as well as all other vehicles designed for speeds of less than 25 miles per hour.

6.10.11 Laser Signs

6.10.11.1 Laser signs will have one of two signal words, “CAUTION” with black letters on a yellow background or “DANGER” with white letters in a red border on a white background. An International Safety Alert Symbol (equilateral triangle) surrounding and exclamation mark placed left of the signal word located in the uppermost portion of the sign. The symbol panel shall contain a red or yellow radiating sunburst (laser burst symbol) and line. The message panel shall contain warning statements imprinted with black letters depending on the 4 laser classes.

6.10.11.2 Laser sign colors shall be those of opaque glossy samples specified in ANSI Z353.1, Table 1, “Fundamental Specification of Safety Colors for CIE Illuminant C.”

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6.10.11.3 Laser signs shall be used to identify the presence of a radiation hazards with the potential for causing biological damage. Reference MPD 1860.1, "Laser Safety."

6.10.11.4 Laser signs may vary slightly in design depending on the manufacturer.

6.10.12 Other Signs and Tags

6.10.12.1 Fire safety signs do not have a standard signal word, and typically have a white symbol on a red background, or a black image on a white background with a red border. The symbol panel, if used, shall be red on white, or white on red. The message panel shall be printed in red letters on a white square or rectangular background.

6.10.13 Lockout/Tagout tags

6.10.13.1 Shall consist of the colors white, red, and black.

6.10.13.2 Shall have a white background with red diagonal stripes.

6.10.13.3 Shall have the signal word "DANGER" in a red oval within a black border near the upper most portion of the tag.

6.10.13.4 Shall have the words "LOCKOUT/TAGOUT" printed on the red diagonal stripes.

6.10.13.5 Shall have the major message words "DO NOT OPERATE".

6.10.13.6 Reference MWI 8715.2, "Lockout/Tagout Program," for more information.

6.10.13.7 Lockout/Tagout tags may vary slightly in design depending on the manufacturer.

6.10.14 Piping Signs and Labels

6.10.14.1 Piping signs and labels are recommended for the identification of piping systems used in commercial and institutional installations, and in buildings used for public assembly. Piping systems are divided into three categories: High Hazard Materials, Low Hazard Materials and Fire Suppression Materials.

6.10.14.2 High Hazard Material piping systems should have signs or labels with black letters imprinted on a yellow background. Materials in these piping systems include corrosive and caustic materials; substances that are toxic or capable of creating toxic gases; explosive and flammable materials; radioactive substances; and materials that if released would be hazardous due to the extreme pressure or temperatures.

6.10.14.3 Low Hazard Material piping systems are divided into two different color schemes. Materials in these piping systems are not inherently hazardous and have a small chance of harming employees through mild temperatures and low pressures. Piping systems containing

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liquids or liquid mixtures should have signs or labels with white letters imprinted on a green background. Piping systems containing gases or gaseous mixtures should have signs or labels with white letters imprinted on a blue background.

6.10.14.4 Fire Suppression Materials piping systems should have signs or labels with white letters imprinted on a red background. Materials in these piping systems include fire protection materials such as foam, carbon dioxide (CO₂), Halon and water.

6.10.14.5 Piping labels should be positioned on the pipes so they can be easily read. The proper placement is on the lower side of the pipe if the employee has to look up to the pipe, on the upper side of the pipe if the employee has to look down towards the pipe, or directly facing the employee if on the same level as the pipe.

6.10.14.6 Piping Labels should be located near valves, branches, where a change in direction occurs, on entry/re-entry points through walls or floors, and on straight segments with spacing between labels that allows for easy identification.

6.10.14.7 Piping sign and label colors shall be those of opaque glossy samples specified in ANSI Z353.1, Table 1, "Fundamental Specification of Safety Colors for CIE Illuminant C."

6.10.14.8 Reference ASME A13.1, "Scheme for Identification of Piping Systems," for additional information.

6.10.15 Chemicals and Hazardous Materials

6.10.15.1 Chemical and hazardous material containers shall be identified using HMIS or NFPA 704 or other MSFC approved signs, labels and tags in accordance with MPG 1840.3, "MSFC Hazard Communication Program."

6.10.15.2 All chemical containers (excluding small transfer containers for an employee's own immediate use) shall be labeled or tagged in accordance with 29 CFR 1910.1200. As a minimum the label shall identify the chemical as it appears on the Material Safety Data Sheet (MSDS) and contain the appropriate hazard warning.

6.10.15.3 Laboratory areas that have special or unusual hazards should be posted with warning signs. These hazards may be radiation, x-ray, laser operations, flammable materials, biological hazards, or other special situations.

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6.11 Barricades

6.11.1 Temporary physical barricades shall be constructed of substantial material capable of impeding entry or deny access to an area. These barricades can be constructed of a wooden structure, orange polyethylene fencing with a grid or diamond mesh structure, concrete barriers, etc.

6.11.2 Barricade tape and traffic cones are not categorized as physical barricades, due to the ease with which they may be bypassed.

6.11.3 A barricade shall not be categorized as permanent unless constructed of extremely durable material (e.g., metal, concrete or wood), and installed in a manner that effectively prevents removal by unauthorized personnel.

6.11.4 Barricades shall be installed to identify and restrict access to hazardous locations, areas, operations, or processes. If authorized personnel will be permitted to cross the barricades, a sign or tag shall be posted on or near to the barricade bearing the message “Authorized Personnel Only.”

6.11.5 When a barricade will be left unattended by the responsible organization, a sign or tag shall be posted on or near to the barricade identifying a point of contact name, phone number, and organization. Depending on the circumstances, posting of a hazard notification sign or tag may also be required.

6.11.6 Barricades shall be installed by any employer at MSFC to provide hazard notification to personnel working at MSFC. The MSFC Protective Services Department shall be responsible for installing barricades at accident scenes, and for controlling site access (authorized personnel only).

6.11.7 Temporary barricades shall be maintained by the organization that erected them. This includes periodic verification that the barricade installation continues to effectively deter unauthorized employee access to the hazard.

6.11.8 Barricade tape is one method used to block or restrict access to hazardous areas. This tape will also be used by Security and other organizations to restrict access to mishap scenes, for purposes of preserving evidence. This tape may be used as a temporary barricade until a physical or permanent barricade is erected.

6.11.9 Barricade tape can be used to block or restrict access to hazardous areas for a maximum period of five (5) consecutive workdays. If a barricade is required for a longer time period, a physical barricade shall be erected.

6.11.10 Barricade tape imprinted with hazard identification (e.g., asbestos or biohazard) shall only be used to deter access to areas characterized by the specified hazard category.

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6.11.11 The organization that erected a temporary barricade shall be responsible for removing the barricade when the hazard has been corrected, operation has been completed, or a permanent access control has been installed or implemented.

6.11.12 Barricades erected during lifting operations shall be placed in accordance with Appendix B, "Guideline for Falling Object Safety Zone."

6.12 Color Code for Marking Physical Hazards

6.12.1 Red shall be the basic color for the identification of: Danger; Fire protection equipment and apparatus; Safety cans or other portable containers of flammable liquids having a flash point at or below 80 deg. F, excluding shipping containers, shall be painted red with some additional clearly visible identification either in the form of a yellow band around the can or the name of the contents conspicuously stenciled or painted on the can in yellow; Emergency stop bars and Stop buttons used for emergency stopping of machinery.

6.12.2 Yellow shall be the basic color for designating caution. Alternating yellow and black stripes or squares may be used for maximum contrast with a specific background. Yellow shall used for marking physical hazards such as: Striking against; stumbling; falling; tripping; caught between; Flammable material storage cabinets; Containers for corrosive or unstable materials. Such containers shall be yellow, or identified by a yellow band around their middle and placed at least ¼ of the container's height. The container shall be labeled to identify its contents.

6.12.3 Orange shall be the basic color for designating warning and for representing a level of hazard less that that requiring the danger signal, but more than that requiring the caution signal. Orange shall be used for marking such as; Machinery hazards such as parts having the potential to cut, crush, or otherwise injure personnel; Machinery hazards such as open or removed enclosure doors and/or guards, where personnel could be exposed to unguarded hazards; Moveable parts have the potential to injure personnel such as: movable guards; pulleys; gears; rollers; cutting devices; power jaws. Marking the edges of such parts will assist in drawing employee attention to the most hazardous system component.

6.12.4 Green shall be the basic color for designating safety instructions and information. Green shall be used for marking items such as: storage location of protective and other safety equipment; safety bulletin boards and safety information signs.

6.12.5 Blue shall be the basic color for designating employee notices. Blue shall be used for identifying parking areas for physically challenged persons, handicap accessible facilities, loading dock instructions.

6.12.6 Combinations of black and white shall be the basic colors for designating traffic and facility information such as: traffic markings; housekeeping markings; floor load limits, etc.

6.13 Low Oxygen Alarms

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6.13.1 Locations where a low oxygen alarm condition exist; or a toxic release occurs; or a combustible gas alarm condition exists; personnel shall take action in the following sequence:

6.13.1.1 In the event of an alarm immediately evacuate the area to a designated safe location.

6.13.1.2 Report the emergency condition to the MSFC Protective Services by calling 911.

6.13.1.3 Keep non-emergency personnel from entering the affected area. No one shall be allowed to enter the area without wearing self-contained breathing apparatus (SCBA) or using an oxygen meter.

6.13.1.4 Contact Environmental Health Services if an oxygen deficiency assessment is required in your area.

7. NOTES

7.1 Instructions for the use of lockout/tagout are found in MWI 8715.2, "Lockout/Tagout Program."

7.2 Examples of the various signs and tags found at MSFC are shown in Appendix A.

8. SAFETY PRECAUTIONS AND WARNING NOTES

Observe and follow all sign and tag warnings.

9. RECORDS

9.1 The record for training is the attendance sheet for the monthly safety meeting with the topic "Hazard Warning Signs and Barricades." This attendance sheet shall be maintained by the supervisor in the Supervisors Safety Web Page (SSWP) database in accordance with NRRS 3/33 (G.2) [3400] for the length of employment then destroy when no longer needed.

10. PERSONNEL TRAINING AND CERTIFICATION

10.1 Employees shall be provided with training in accordance with the requirements of 29 CFR 1910.145, "Specifications for accident prevention signs and tags."

10.2 This training will describe the alerting methods (signs, tags, barricades, color codes, etc.) used to warn employees of the potential personal injury hazards inherent in the work environment and facilities at MSFC.

10.3 This training will be provided by the Safety and Mission Assurance (S&MA) Directorate every two (2) years to the supervisors via the Supervisors Safety Web Page (SSWP) and given to all employees during a monthly safety meeting.

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11. FLOW DIAGRAM

None

12. CANCELLATION

MWI 8715.3C dated May 6, 2004

Original signed by
Robin N. Henderson for

David A. King
Director

APPENDIX A

Example Danger Sign and Tag



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Example Warning Sign and Tag



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Example Caution Sign and Tag



CHEC

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USE

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Example Notice Sign and Tag

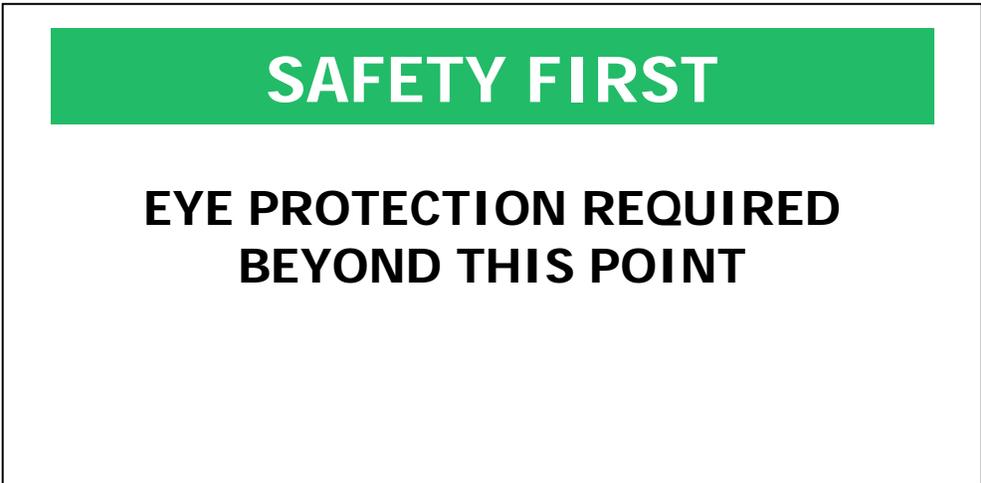


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Example Safety Instruction Sign



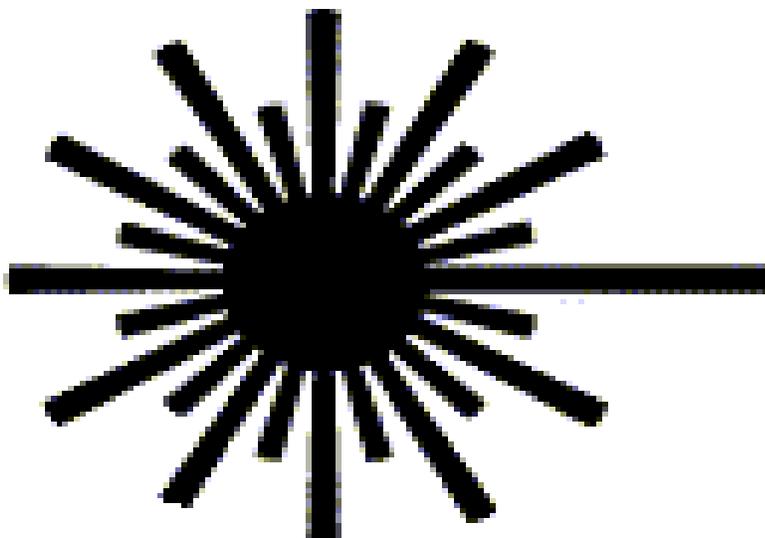
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Example Radiation Hazard Sign



Example Laser Symbol



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Example Biohazard Symbol

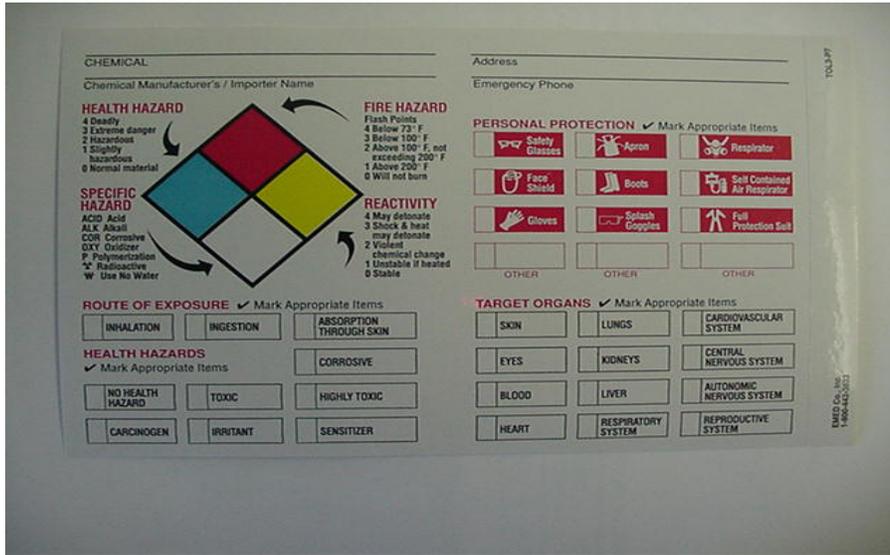


Example Lockout/Tagout Tag

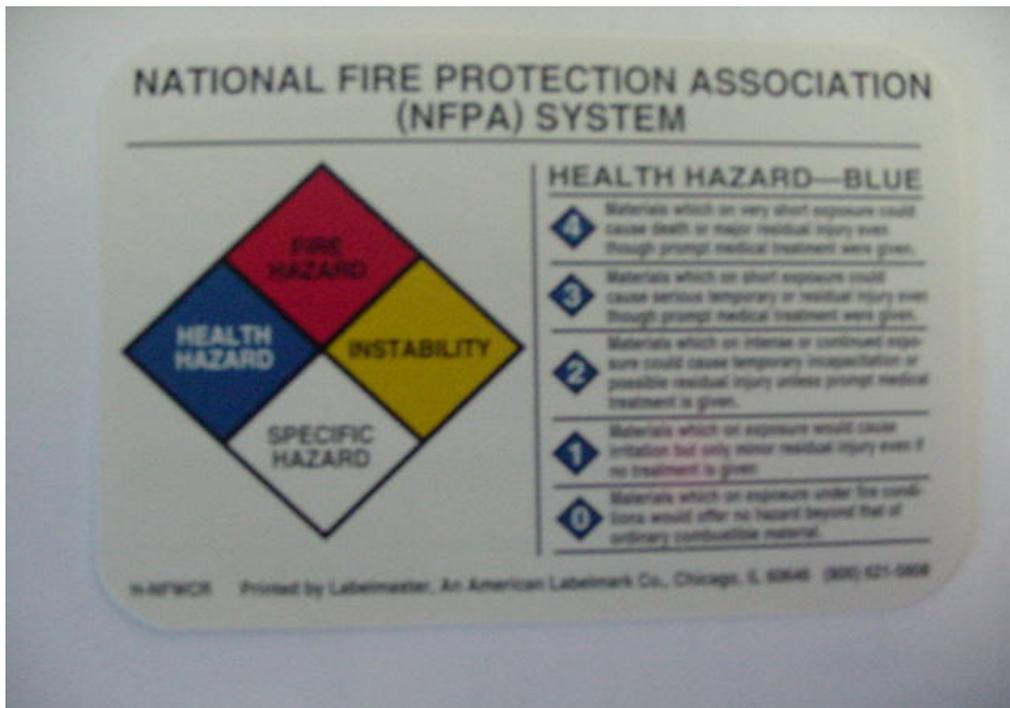


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Example Hazardous Material Identification System (HMIS) label



Example National Fire Protection Association (NFPA) 704 label



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APPENDIX B

GUIDELINE FOR FALLING OBJECT SAFETY ZONE (FLOOR & OFFICE SPACE)
FALLING OBJECT SAFETY ZONE = POTENTIAL FALL HEIGHT / 3

