



Hazardous Energy Control

A. Hazard

1. Potentially hazardous energy is used continuously at NNS to perform various tasks and operate a variety of equipment. If this energy is not channeled and controlled, and personnel come in contact with this energy, the results can be devastating. Examples of such hazardous energy include all sources of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy. Many items of equipment or systems will have multiple energy sources.
2. During the NNS pre-approval process (see General Information), each contractor whose personnel may be exposed to hazardous energy must provide to the NNS EH&S Department a copy of their written Hazardous Energy Control Program. This document must describe the contractor's program for complying with each element of the applicable OSHA standard(s). The contractor shall provide a copy of any changes to their program on an annual basis to NNS.

B. OSHA Regulations and NNS References

1. Where there is potential personnel exposure to hazardous energy, OSHA requires each employer to control this energy to protect employees' health and safety. For non-shipboard operations, personnel at NNS performing facilities work or construction operations must comply with 29 CFR 1910.147 "The Control of Hazardous Energy (lockout/tagout).
2. At NNS, Standard Shipyard Procedure Y-1078, Control of Hazardous Energy, governs the control of hazardous energy in non-shipboard environments. This procedure, Y-1078, is the primary reference for the requirements listed below. These requirements will be updated as necessary when this primary reference is changed.
3. For shipboard operations, there is no particular OSHA regulation, except for a few regulations that apply to very specific operations, such as boilers (29 CFR 1915.162), piping systems (29 CFR 1915.163), propulsion machinery (29 CFR 1915.164), and deck machinery (29 CFR 1915.165).
4. At NNS, Quality Assurance Instruction 604.1 Tagout of Systems/Components governs the control of hazardous energy in shipboard environments. This procedure is the primary NNS reference for the requirements listed below. These requirements will be updated as necessary when this primary reference is changed.

C. Requirements for Tags and Training



1. Contractors shall ensure their employees understand and respect the NNS QAI 604.1 Red Danger tag (NN-54-18), Y-1078 System / Personal Service Tag (54-18NN 7039 (with laminated cover) and NN 7040), Personal Service, System and High voltage locks, and will NEVER:
 - a. Operate equipment or change controls which are secured with any of the above items, or
 - b. Remove any of the above items without proper authorization (Note: If someone does not know what authorization is required, then they are not authorized).
2. Only personnel who have been trained by their employer to understand applicable requirements of their company procedure and authorized to install/remove locks and/or tags shall be allowed to install/remove red tags and/or lockout/tagout equipment.

D. Requirements for Non-Shipboard Hazardous Energy Control

1. NNS Contractors (and subcontractors) performing non-shipboard production work at NNS, including both facilities work and construction operations, shall implement their own lockout/tagout procedure that complies with 29 CFR 1910.147.
2. Locks and tags are required and shall meet the following contractor-specific requirements.
 - a. Contractors shall use the NNS System/Personal Service tag and their company tag that is equivalent to the Newport News' System / Personal Service tag. Contractors shall obtain NNS tags from their Contractor Coordinator. If using a tag for less than two shifts, use NNS tag number NN 7040 (non-laminated). A laminated tag, NN 7039, shall be used if the tag will be in place for more than two shifts.
 - b. A singularly identifiable lock shall be used when locking and tagging out NNS equipment, machinery, or systems. Contractors shall use a red American lock model A1105RED (A1106RED and A1107 RED are also acceptable) when applying a Personal Service tag and lock or a blue American lock model A1105BLU (A1106BLU and A1107BLU are also acceptable) when applying a System tag.
3. The following provides instructions for completing a NNS tag. The information as applicable shall be legibly written with a black Sharpie® (medium, fine point) pen on each tag before it is attached.



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- a. Contractor Name/Phone – If applicable, contractors must legibly write their company name and must include a phone number below the block.
- b. “System Tag”/“Personal Service Tag” - Check either “System Tag” or “Personal Service Tag” as applicable. The tag may only have one block checked.
- c. Equipment/System - Identify the equipment or system to be locked and tagged. Equipment name and asset number shall be provided. System name and location of lock and tag shall be provided. When a system lockout/tagout is not at a specific location, indicate the nearest physical reference point (column, machine, wall, etc.).
- d. Electrical – Check the appropriate box if applicable to the lockout/tagout.
- e. Mechanical / Other - Check the appropriate box if applicable to the lockout/tagout.
- f. Reason for Lockout/Tagout
- g. Testing - Check this block when the equipment / system has been locked and tagged to support testing.
- h. Work in Progress - Check this block when the equipment / system has been locked and tagged to perform service or maintenance
- i. Out of Service – Check this block when the equipment is to remain out of service
- j. Not Operational - Check this block when the equipment / system is not operational and creates a hazard to the equipment and/or personal if operated.
- k. Other - If one of the above categories is not appropriate check this block and provide an explanation for the tag.
- l. Employee Name/Print – Print employees name in this box
- m. Date – Provide the date the tag is hung.
- n. Employee Signature – Provide the employee’s signature in this box
- o. PERNR – Provide the employee’s personal number in this box
- p. Supervisor/Print – Print the employee’s supervisor’s name in this box

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q. Dept. – Provide the employee’s department in this box.

*Additional Information - Authorization to remove a System Lock & Tag, may be noted on the back of the tag.

4. NNS expects contractors to be knowledgeable of the types of hazardous energy sources. Contractors shall identify hazardous energy sources during job planning and ensure that only properly trained and qualified employees perform lockout/tagout.
5. Contractors shall notify their NNS Contractor Coordinator if assistance is required in identifying and/or de-energizing machinery or equipment.
6. Contractor Coordinators and contractors shall work jointly and complete form NN 9372 LOTO Coordination Plan (Figure 4) prior to LOTO taking place.
7. Contractors working on equipment and systems that are out of service, being serviced but currently not being worked, and that if inadvertently energized or moved to a new position could create an employee hazard or potentially damage equipment or company property shall ensure the equipment is properly locked and tagged out using the NNS System/ Personal Service Tag (Figure 1/Marked as a System Tag) and proper contractor tag(s) and lock(s) to control the hazardous energy exposure.
8. High voltage systems (Above 600 volts) and crane power sources will be de-energized by NNS qualified electricians only. Contractors shall secure the hazardous energy sources after NNS has de-energized the system. Contractors shall verify that the system is de-energized by witnessing the NNS verification of de-energization.
9. If a contractor’s employee who originally applied the lock(s) and tag(s) is not present to remove the LOTO, then the contractor shall:
 - a. Follow their lock and tag removal procedures
 - b. Ensure the individual employee is notified
 - c. Notify the Contractor Coordinator that the lock and tag has to be removed
 - d. Complete the “Lock & Tag Removal Form” (NN 9225) (Figure 3), and provide a copy to the Contractor Coordinator and O27

E. Requirements for Shipboard Work and Energy Control

1. Responsibilities

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- a. Contractors shall ensure their work is in compliance and not counter to the NNS tagout and work control requirements.
 - b. All work must be in accordance with QAI 604.1 and other quality assurance instructions for work control.
 - c. Request from the Contractor Coordinator to identify and provide the specific work control instructions.
 - d. Where applicable, ensure that additional control measures such as NNS double barrier and or lock out requirements are met prior to any intrusive work on a system or other actions which could affect the safety of the vessel or personnel.
2. Joint Fleet Maintenance Manual (JFMM) COMFLTFORCOMINST 4790.3
- a. The JFMM Volume IV, Ch. 10 (Work Authorization and Control) provides the procedures for authorization and control of shipboard work.
 - b. Work on ship's systems and components must be properly authorized and controlled in order to ensure rigorous personnel and ship safety standards are met at all times.
 - c. Work on ship's systems and components, regardless of who performs the work, requires formal authorization through the use of a Work Authorization Form (WAF) for the specific work to be accomplished.
 - d. The WAF is the vehicle by which work requiring formal control is authorized for accomplishment and tracked to completion or otherwise no longer requiring isolation or authorization.
3. Tag-Out Users Manual (TUM) S0400-AD-URM-010/TUM
- a. The TUM provides for personnel and ship safety and prevents damage to equipment.
 - b. Prevents improper operation when a component, equipment, system or portion of a system is isolated or in an abnormal condition.
 - c. Prevents improper operation when a freeze seal is applied to a system or when other safety devices such as blank flanges are installed for testing, maintenance, or casualty isolation.



- d. Provides a procedure for use when an instrument is unreliable or not in its normal operating condition.
 - e. Provides standard tag-out procedures.
 - f. Provides a procedure for control of hazardous energy.
4. Quality Assurance Instructions (QAI's) for the Work Control Process
- a. The purpose of these instructions is to establish a system which provides for the accountability for all work, inspection and testing performed by the company and it's subcontractors on non-nuclear systems/components and provides the method for coordinating work and testing.
 - b. The company has multiple Quality Assurance Instructions for handling the work control process on various ship platforms:
 - 1) QAI-605.1 WORK PERMIT SYSTEM FOR SUBMARINES AND DRY DECK SHELTERS
 - 2) QAI-605.2 WORK CONTROL SYSTEM FOR SUBMARINE FLEET SUPPORT
 - 3) QAI-605.3 WORK PERMIT SYSTEM FOR NAVAL AIRCRAFT CARRIERS
 - 4) QAI-605.6 WORK CONTROL PROCESS FOR NAVAL AIRCRAFT CARRIER OVERHAUL
5. Requirements for Shipboard hazardous energy control.
- a. NNS Contractors and their subcontractors performing shipboard production work at NNS shall implement their own company's lockout/tagout procedure. Contractors may reference Quality Assurance Instruction 604.1 Tagout of Systems/Components. Contractors whose work may involve shipboard hazardous energy sources should contact their Contractor Coordinator for a copy of this procedure, and should ensure that their copy is maintained up to date. Contractor's procedures shall be consistent with, no less stringent than, and in harmony with NNS procedure QAI 604.1.
 - b. Contractors shall ensure their personnel who are authorized to issue, verify or apply/remove red danger tags are properly trained. This training shall include:
 - 1) A description and explanation of the contractors tagout program,



- 2) The purpose and use of red tags and work permit procedures at NNS,
 - 3) Typical hazardous energy sources at NNS and their means of isolation,
 - 4) Release of stored energy, and
 - 5) Procedures for completing, applying and removing red danger tags at NNS.
- c. Contractors shall provide documentation of this training to their NNS Contractor Coordinator prior to the activation date of their initial purchase order and at other times upon request.
- d. Contractors shall apply red DANGER tags to all hazardous energy sources when their employees work in any area or on any system that may expose them to hazardous energy or the unexpected re-energization of machinery or a system. Contractors shall use NNS red DANGER tags (NN-54-18) and NNS yellow CAUTION tags. (NNS Contractor Coordinators are required to provide these tags to NNS Contractors.)
- e. Following is a description of items to be completed on the tag:
- 1) Contractor Name — Contractors must legibly write their company name and must include a phone number in this block.
 - 2) Component and System I.D. — Identify the component or unit, and system to be tagged. When a blank is installed the specific joint, flange, or component must be identified as well as the system. When a blank is not installed at a specific joint, flange, or component, the tag is to indicate the nearest joint, flange, or component in that line.
 - 3) Position — (1) Red Tags: Check either “OPEN,” “CLOSED,” or “BLANKED” as applicable. If a position is not applicable to the particular situation (e.g., roped off passageway or unsecured ladder) line out all positions. (2) Caution Tags: Check “OPEN,” “CLOSED,” or “SEE ISSUER” as appropriate. If a position is not applicable to the particular situation (e.g., - identification of JPTG boundaries), line out both positions.
 - 4) Reason for Tag — Check the appropriate box (or boxes) to indicate the reason for the tag:
 - a) Testing — check this block when the system/component is being tagged to support testing only.



- b) Work in Progress — check this block for lockout/tagout of a system or component which provides a safety boundary for work to be performed.
 - c) Not Operational — check this block for tag-out of a system or component which provides a safety boundary where no work is being performed.
 - d) Other — if one of the above categories is not appropriate check this block and provide an explanation for the tag.
- 5) Issuer- Enter the issuer's name, signature, and telephone number. This block is reserved for the person who hung the tag. Only authorized employees may apply tags where the reason for the tag is "Work in Progress" or "Testing."
- a) Supervisors and Department O27 staff may apply "Not Operational" or "Other" tags to systems or equipment that pose a hazard.
- 6) Dept. - Enter "NA" in these blocks.
- 7) Tag Number/Time – This space shall be used to account for tags.
- a) When the tag designates a boundary of a Work permit, the unique Work Permit number, preceded by the "WP" designator, and the corresponding tag number shown in the Tag Record of the Work Permit shall be entered in this space.
 - b) Tags not used in conjunction with Work Permits and that will remain affixed for more than one shift be assigned a number from the Tagout Log, and the number shall be entered in this space.
 - c) For tags attached for temporary use (not to extend beyond one shift) "NA" shall be entered in this space.
- 8) Date – Enter the date the tag is issued.
- 9) Verification- Work shall not start until the tag has been verified.
- a) Work in Progress tags shall have an independent verification by the system expert (owning trade) of the tag and component tagged. The verifier shall physically verify the following:
 - i. Position of the component tagged.
 - ii. The tag is hanging on the identified component.



iii. The tag is filled out in accordance with this procedure.

Note: This block can not be signed by the same person who signed the contractor's name block or assisted in the tagout.

- b) For Testing, Not Operational and Other tags- Verification may be performed by the same person who hung the tag.
- c) Virginia Class Submarine applied tags- verifier shall initial the "Date Hung" block of the log after he has performed the above verification. If the tagout is for work permit he shall initial beside the valve position on the tagout sheet.

- 10) Attachment of tags- Tags shall be attached by the Foreman/Test Supervisor (or his designated representative) of the work group. Prior to attaching the tag, the person hanging the tag shall ensure the component is identified with a temporary or permanent label. (Labels are not required on items that are not considered "operable"- i.e. blanks, manhole covers, or plugs) Temporary labels for valves or components should be metal or plastic and securely fastened to the component.
- 11) Hanging of tags, tagout accountability and clearance of tags shall be in accordance with NNS QAI 604.1 Tagout and Work Control procedures. Request copy of these procedures from assigned Contractor Coordinator.