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1713 Bedford Row

Halifax, N.S./Halifax, (N.É.)

Halifax

Nova Scotia

B3J 1T3

Bid Fax: (902) 496-5016

SOLICITATION AMENDMENT MODIFICATION DE L'INVITATION

The referenced document is hereby revised; unless otherwise
indicated, all other terms and conditions of the Solicitation
remain the same.

Ce document est par la présente révisé; sauf indication contraire,
les modalités de l'invitation demeurent les mêmes.

Comments - Commentaires

Vendor/Firm Name and Address

Raison sociale et adresse du
fournisseur/de l'entrepreneur

Issuing Office - Bureau de distribution

Atlantic Region Acquisitions/Région de l'Atlantique
Acquisitions

1713 Bedford Row

Halifax, N.S./Halifax, (N.É.)

Halifax

Nova Scot

B3J 1T3

Title - Sujet Safety Training	
Solicitation No. - N° de l'invitation W010X-19J001/A	Amendment No. - N° modif. 005
Client Reference No. - N° de référence du client W010X-19-J001	Date 2018-09-21
GETS Reference No. - N° de référence de SEAG PW-\$HAL-309-10463	
File No. - N° de dossier HAL-8-81018 (309)	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2018-09-28	Time Zone Fuseau horaire Atlantic Daylight Saving Time ADT
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input checked="" type="checkbox"/> Other-Autre: <input type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: MacNeil, Blaine A.	Buyer Id - Id de l'acheteur hal309
Telephone No. - N° de téléphone (902) 403-3918 ()	FAX No. - N° de FAX (902) 496-5016
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction:	

Instructions: See Herein

Instructions: Voir aux présentes

Delivery Required - Livraison exigée	Delivery Offered - Livraison proposée
Vendor/Firm Name and Address Raison sociale et adresse du fournisseur/de l'entrepreneur	
Telephone No. - N° de téléphone Facsimile No. - N° de télécopieur	
Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)	
Signature	Date

Amendment #5

Please note the following clarifications/changes to the solicitation:

1) The following is inserted into the RFP under the Statement of Work:

4.6.4.1 have an in-depth knowledge of Confined Space and Basic Rescue Training in Naval and/or marine environment and within a heavy industrial setting. Note, in-depth knowledge consists of a minimum of two (2) years of experience teaching courses which incorporates Confined Space and Basic Rescue Training in a naval and/or marine environment.

2) Please see the following Q&A and note the change to the Basis of Payment, which will be calculated accordingly:

Question:

Please note that Annex A SoW Section 3.1 (Scope) indicates “up to six (6) serials per fiscal year of a two (2) day Confined Space Entry and Basic

Rescue Practical Training and Certification course per fiscal year” Section 4.5.1 of the SoW also indicates six (6) dates by month for this course.

Annex C Basis of Payment only indicates 4 serials for Item #4 Confined Space Entry and Basic Rescue Practical Training to be priced.

I’m assuming the Basis of Payment should probably be changed to 6 serials? Can you please confirm.

Response:

The bidder is correct. Annex C, the Basis of Payment, should state for Item #4 Est Serials: qty 6 and is hereby changed.

3) Note that faxed bids and/or amendments to a bid are acceptable prior to the solicitation closing date and time.

Attached are additional bidder questions and responses. Note that there are references to Annexes that are not included in this amendment as they are not relevant to the solicitation.

All other terms and conditions remain unchanged.

W010X9J001- SOLICITATION W010X-19J001A SAFETY TRAINING QUESTIONS AND ANSWERS

	Statement	Question	Answer
2.1	MARLANT Safety and Environment Management System, Directive #S 10 - Confined Space Entry (enclosed);	The directive was not included in the package as identified. Could we get a copy for review?	Attached
2.2	MARLANT Fleet Safety and Environment Management System, HAL SOP S8- Confined Space Entry, KIN SOP S8- Confined Space Entry and VIC SOP S8- Confined Space Entry.	The documents were not included in the package. Could we get copies for review?	Attached
2.3	MARLANT Safety and Environment Management System, Directive #S6 – Fall Protection (enclosed);	The directive was not included in the package as identified. Could we get a copy for review?	Attached
2.4	MARLANT Fleet Safety and Environment Management System, HAL SOP S5- Fall protection and Elevated Structures, KIN SOP S5- Fall Protection and Elevated Structures and VIC SOP S5 - Fall Protection and Elevated Structures;	The documents were not included in the package. Could we get copies for review?	Attached
3.1 4.1.3	The primary objective of this request is to select one (1) contractor to provide; one (1) serial per fiscal year, of a one (1) day Fall Protection Equipment Inspection Certification course; Fall Protection Equipment Inspection Certification	Is the intention for the fall protection equipment inspection course to be generic in nature for all types of equipment or is the intent for the course material to be specific to the equipment used by the organization and to the specific manufacturer's specifications? As the statement of work is now stated, it appears there is a desire to have specific	As noted in the SOW (Section 4.1.3.), the course is to be generic for all types of equipment (various manufactures).

		manufacturers' specifications included however there is no direction as to what manufacturers are utilized.	
3.1 4.1.2	<p>The primary objective of this request is to select one (1) contractor to provide; up to four (4) serials per fiscal year, of a two (2) day Fall Arrest and Basic Rescue Training and Certification course;</p> <p>The vendor shall provide practical training exercises on suitable elevated structures using the following equipment, where applicable:</p>	We are looking for clarification on what is considered a suitable elevated structure for the purposes of the training?	<p>As per the SOW, the structure must be such that practical training exercises on the following equipment can be provided during the course:</p> <p>casualty harness; rope grabs, carabineers and other hardware; ladder climbing systems; tripod lowering/recovery systems; rope-based retrieval system; self-retracting lifelines; fall arrest winches; casualty lowering; casualty raised using mechanical advantage haul systems; anchor selection and rigging; emergency response procedures; and care and maintenance and use of all rescue equipment.</p> <p>Therefore, it must be a structure that students can get experience using equipment at height.</p>
3.1 4.1.4.	<p>The primary objective of this request is to select one (1) contractor to provide; a five (5) day Fall Arrest and Basic Rescue Competent Trainer course, (Train the Trainer)</p> <p>Fall Arrest and Basic Rescue Competent Trainer.</p>	Is the intent for the train the trainer course to provide the trainers a complete manual to train other employees from at the completion of the course or is the intent for the instructor to be trained to put on the course that they would design themselves based on the training provided?	The intent is to provide a manual to be used to train other employees.
3.1	The primary objective of this request is to select one (1) contractor to provide;	Is a mock confined space that is not totally enclosed acceptable or is the expectation that the training	It does not have to be totally enclosed; however, it must be a structure designed to simulate real world situations.

W010X9J001- SOLICITATION W010X-19J001A SAFETY TRAINING QUESTIONS AND ANSWERS

4.1.5. 4.3.3.	<p>up to six (6) serials per fiscal year of a two (2) day Confined Space Entry and Basic Rescue Practical Training and Certification course per fiscal year,</p> <p>Confined Space Entry and Basic Rescue Practical Training and Certification</p> <p>The vendor must have the ability to provide hands on experience with the use of a structure designed to simulate real world situations.</p>	<p>be completed with an actual confined space? It is possible to simulate a confined space scenario without it being a confined space and it is safer for the participants.</p>	
4.3.2.	<p>All training must be conducted at the vendor's location and shall be provided within a fifteen (15) kilometer radius of HMC Dockyard.</p>	<p>Is the 15km radius set in stone or can the area be extended if requested in the submission?</p>	<p>Yes, the training must be within 15 km radius of HMC Dockyard.</p>
4.3.6 4.3.7	<p>Equipment and tools shall be Canadian Standards Association (CSA) approved.</p> <p>The contractor shall submit to an inspection of all PPE and safety equipment at any time upon request by a representative of DND.</p>	<p>Is the expectation that all equipment used for the course will be provided by the successful bidder?</p>	<p>As per section 4.3.5 of the SOW, the contractor must provide all equipment used for the course.</p>
4.5.1	<p>Exact dates and times must be negotiated with the Project Authority upon contract award; however, Fall Arrest and Basic Rescue Practical Training and Certification to be</p>	<p>Is the expectation that courses will begin in the 2018 year?</p>	<p>Yes</p>

	<p>scheduled for Sept, Oct, Nov and Jan.</p> <p>Fall Arrest Equipment Inspection Certification training to be scheduled for Oct.</p> <p>Confined Space Entry and Basic Rescue Practical Training and Certification to be scheduled for June, Sept, Oct, Nov, Jan and Feb.</p> <p>Fall Arrest and Basic Rescue Competent Trainer to be scheduled for Feb.</p>		
4.6	<p>Contractor Qualifications The Contractor's proposed instructor shall:</p> <p>4.6.1. be fully qualified to instruct the subject material;</p> <p>4.6.2. have at least five (5) years of experience certifying participants;</p> <p>4.6.3. have an in-depth knowledge of Fall Arrest and Basic Rescue Training in a naval and/or marine environment and within a heavy industrial setting. Note, in- depth knowledge consists of a minimum of two (2) years of experience teaching courses which incorporates Fall Arrest and Basic Rescue Training in a naval and/or marine environment;</p> <p>4.6.4. have an in-depth knowledge of Fall Protection Equipment Inspection in a naval and/or marine environment. Note, in-depth knowledge</p>	<p>The instructor requirements appear to be very specific. Are the years' experience requirements specific to individual instructors or is the experience able to be provided through various members of the bidding team? i.e. there are five people on the bidding team with some having experience in naval and / or marine fall protection use and others with experience in fall protection training and regulatory enforcement?</p>	<p>As per section 4.6 of the SOW, the experience requirements are specific to an individual instructor.</p>

	<p>consists of a minimum of two (2) years hands-on experience in Fall Protection Equipment Inspection Certification in a naval and/or marine environment, or through two (2) years of experience teaching courses which incorporates Fall Protection Equipment Inspection Certification in a naval and/or marine environment; and</p> <p>4.6.5. have at least five (5) years of experience teaching courses which meet Federal Regulations.</p>		
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SOP S5 – FALL PROTECTION AND ELEVATED STRUCTURES

References

- A. Canada Occupational Safety & Health Regulations Part XII
- B. National Safety Council - Accident Prevention Manual for Business and Industry - Edition 11, Chapter 6
- C. C-02-040-009/AG-001, Chapter 6 - Elevated Work Structures
- D. C-02-040-009/AG-001, Chapter 14 - PPE

Purpose

- 1. To provide direction to ensure that when personnel are put into a position where a fall from height is possible, the proper equipment and procedures are put into place.

Scope

- 2. This SOP applies to all personnel working at heights on board the ship.

Definitions

- 3. At Height - is defined as from an unguarded position, at a height of 2.4m and greater, above the nearest permanent safe level.
- 4. Elevated Work Structure - is a structure or device that is used as an elevated work base for persons or as an elevated platform for material and includes any scaffold, staging, walk-way, decking, bridge, boatswain's chair, tower, crawling board, temporary floor, any portable ladder or means of access or egress from any of the foregoing, and any safety net, landing-or other device used in connection with such a structure.
- 5. Fall Protection Equipment (FPE) - consists of a full body harness, a connecting system, and may include an improvised anchorage.
- 6. Fall Protection System - consists of, a full body harness, a connecting system, an improvised anchorage point and a rescue plan.
- 7. Harness Hang Syndrome (Suspension Trauma) - occurs when a person is left hanging from a rope, immobile in a harness and can result in death. The effect of the harness leg straps may be likened to tourniquets above each thigh in certain circumstances (especially dorsal suspension in a fall arrest harness) and this may bring about a lack of venous blood return or compartmentalisation within the legs. The body's response may take the form of syncope (fainting / unconsciousness), toxin release within the legs and cardiac arrhythmia.

8. Mobile Elevated Work Structure - a vehicle-mounted aerial device, elevating rolling work platform, boom-type elevating work platform or self-propelled elevating work platform.
9. Person In Charge (Supervisor) - a qualified person appointed by management to ensure the safe and proper conduct of an operation or of the work of personnel.
10. Qualified Person - in respect of a specified duty, a person who because of their knowledge, training and experience is qualified to perform that duty safely and properly exercising Due Diligence.
11. Rescue Plan - a plan, which would utilize either a self-rescue technique or in-house personnel, trained and practiced in performing a rescue on a suspended casualty or an outside agency qualified to perform a rescue (DND Fire Department). The plan should be as simple as possible and started from the bottom up (it is always better to discover the anchor point will not hold while at deck level).
12. Safety Restraining Device – any equipment that is specifically designed to be used by a person or persons to protect or prevent falling while working at height, and includes any fitting, fastening or accessory, such as, but not limited to, body belts, safety harnesses, seats, ropes, belts, straps and life-lines .
13. Suspended Casualty - a person who due to illness, injury or entanglement is incapable of getting down on his or her own from height.

Responsibilities/Duties

14. The CO is to ensure that FPE is properly maintained and controlled.
15. Normally the Combat Systems Engineering Department (CSE Dept) will maintain all holdings of FPE. They are to ensure through regular inspections that equipment is suitable for use and are to maintain the Fall Protection Inventory List (Annex S5A) and ensure the Person Aloft Chits (DND 2145) are properly completed.
16. Normally the Fire Fighting Department will maintain and handle the rescue equipment and the Senior FF will act as On Scene Commander (OSC) for a rescue.
17. Organization - Prior to commencing the job, all personnel involved shall be qualified to perform the tasks expected of them and should include a Person In Charge/Supervisor and all other personnel required to carry out the task.
18. Supervisors are to ensure that personnel are instructed and properly trained on all aspects of Fall Protection/Fall Arrest including but not limited to: the inspection, proper fitting and wearing, preventive maintenance and life of the equipment that they will employ.

Direction/Instruction

19. Fall hazards must first be identified and then controlled through engineering controls if feasible. When engineering controls are not feasible, then personal fall arrest systems, administrative controls and training must be instituted. Due to the inherent risks of working aloft on board ships, factors such as motion, wind, waves, rain and emissions both exhaust and Radiation Hazard can and will significantly alter the conduct of the job. A thorough risk assessment must be carried out prior to commencement of the work and it is essential that all personnel involved in the work are involved in the planning.

Fall Protection Equipment

20. FPE is to be worn by all personnel working 2.4 meters above a permanent safe level. Only CSA approved FPE is to be used for working aloft. The user must inspect all equipment prior to its use. Typically HALIFAX Class ships hold 15 to 20 harnesses to conduct all operations. Normally stored in a central, dry and clean location.

21. Personnel requiring a harness are to draw one from the CSE Dept. Before receiving any equipment the person shall hand over their Fall Protection Card, which is held by the CSE Dept until the harness is returned. The wearer is to inspect and properly adjust the harness with the CSE Dept member confirming the fit. Upon return of the harness, a CSE Dept member shall inspect the harness and return the member's Fall Protection Card.

Inspection

22. The annual inspection of FPE shall be conducted by the qualified Formation inspector (FSE in MARLANT or FMF in MARPAC) and before each use by the user. The FPE shall be inspected for rips, burns, discoloration, chemicals, paint, and solvents. Hardware such as D rings, carabineers, buckles, snaps, and eyes must be inspected for possible scratches, cracks, tears, dents, etc. All FPE that fails inspection must be removed from service and reported to the appropriate supervisor. If required, replace the FPE before proceeding with the work and report the damaged FPE to the CSE Dept. The CSEO is to ensure that FPE that does not meet inspection or is greater than 10 years old is destroyed and replaced.

23. At no time shall alterations of any kind be carried out on any piece of FPE, including: marking on, cutting, sewing, adding to or removing pieces.

Elevated Work Structures

24. No department shall permit the use of a temporary structure where it is reasonably practicable to use a permanent structure.

25. Departments shall ensure that each temporary work structure used by personnel is safe for use, and is used in a safe and proper manner.

26. Departments shall ensure that a qualified person visually inspects each temporary structure prior to each work shift to ensure, insofar as possible by such inspection, that it is safe to use and ensure that a record of each inspection is made by the person who carried out the inspection. Where an inspection reveals a defect or condition that adversely affects the structural integrity of a temporary structure, no personnel shall use the temporary structure until the defect or condition is remedied.

27. No person shall use a temporary structure unless:

- a. authority has been received from the person in charge to use it;
- b. the person has been trained and instructed in its safe and proper use; and
- c. the person, or the person in charge, visually inspects the structure prior to each work shift to ensure, that it is safe to use.

28. Every person shall report to the person in charge, as soon as practicable any defect or condition in a temporary structure that may, in the opinion of that person, create a hazard. No personnel shall use any temporary structure that has a defect or condition that, in the opinion of that person, may endanger the person or any other personnel, until the structure has been examined by a qualified person and declared to be safe.

29. No personnel shall work on a temporary structure in rain, snow, hail or an electrical or wind storm that is likely to be hazardous to the safety or health of the person, except where the work is required to remove a hazard or to rescue another person. Every platform, hand-rail, guardrail and work area on a temporary structure shall be kept free of accumulations of ice and snow while the temporary structure is in use.

30. Guardrails and toe boards shall be installed at every open edge of the platform of a temporary structure. Every guardrail shall consist of:

- a. a horizontal top rail not less than 900 mm and not more than 1100 mm above the base of the guardrail;
- b. a horizontal intermediate rail spaced midway between the top rail and the base; and
- c. supporting posts spaced not more than 3 m apart at their centres.

31. Every guardrail shall be designed to withstand a static load of 890 N applied in any direction at any point on the top rail.

32. When guardrails or ladders are removed for any reason, temporary guardrails shall be rigged and a barrier erected at the top of the ladder. In addition, when escape hatches are left open an appropriate barrier shall be erected in front of the hatch

33. When there is a hazard that tools, equipment or materials may fall onto or from a temporary structure, a safety net shall be provided to protect from injury any personnel on or below the temporary structure.

34. Where a vehicle or a pedestrian may come into contact with a temporary structure, a person shall be positioned at the base of the temporary structure or a barricade shall be installed around it to prevent any such contact.

Paint Cats

35. When a ship is using a paint cat, the Deck Department is responsible to ensure it is inspected daily, prior to use. The OOD is responsible for ensuring the safety of personnel on the paint cat and should place someone in charge while on the paint cat. The OOD must also consider weather conditions, ship’s movements and other yard and port activities that could affect personnel on the paint cat. Personnel on the paint cat shall wear PPE such as life jackets and FPE as required. Refer to SOP E6 - External Ship Husbandry for further environmental considerations.

Mobile Elevated Work Structures

36. Departments shall ensure that the design, construction, maintenance and use of every mobile elevated work structure shall comply as appropriate, with:

- a. CAN 3 B354.1-M82 Elevating Rolling Work Platforms;
- b. CAN 3 B354.2-M82 Self-Propelled Elevating Work Platforms for Use on Paved/Slab;
- c. CAN 3 B354.3-M82 Self-Propelled Elevating Work Platforms for Use as Off-Slab;
- d. CAN 3 B354.4-M82 Boom Type Elevating Work Platforms; and
- e. CSA C225-1976 Vehicle Mounted Aerial Devices.

37. Departments shall ensure, to the extent that is practicable, that where it is necessary to use or move a mobile elevated work structure with personnel on such a device, the person in charge ensures that the device is observed until it is no longer in use.

Temporary Stairs, Ramps and Platforms

38. Temporary stairs, ramps and platforms shall be capable of supporting at least four times the load that is likely to be imposed on it. Temporary stairs, ramps and platforms

shall be designed, constructed and maintained to support any load that is likely to be imposed on them and to allow safe passage of persons and equipment on them.

- 39. Temporary stairs shall have uniform steps in the same flight:
 - a. a slope not exceeding 1.2 to 1; and
 - b. a hand-rail that is not less than 900 mm and not more than 1100 mm above the stair level on open sides, including landings.
- 40. Temporary ramps and platforms shall be:
 - a. securely fastened in place;
 - b. braced, if necessary, to ensure their stability; and
 - c. provided with cleats or surfaced in a manner that provides a safe footing for personnel.
- 41. A temporary ramp shall be so constructed that its slope does not exceed:
 - a. where the temporary ramp is installed in the stairwell of a building not exceeding two storeys in height, 1 to 1, if cross cleats are provided at regular intervals not exceeding 300 mm; and
 - b. in any other case, 1 in 3.

Scaffolds

42. Departments shall ensure, that the design, construction and use of scaffolds meet the requirements of CSA Standard S269.2/M87, Access Scaffolds for Construction Purposes. Every scaffold shall be capable of supporting at least four times the load that is likely to be imposed on it. The platform of every scaffold shall be at least 480 mm wide and securely fastened in place. The footings and supports of every scaffold shall be capable of carrying, without dangerous settling, all loads that are likely to be imposed on them.

43. The erection, use, dismantling or removal of a scaffold shall be carried out by or under the supervision of a qualified person.

Portable Ladders

44. Only CSA approved portable ladders, appropriate to the task, that meet the Class 1 standard shall be used on board ship.

45. Where, because of the nature of the location or of the work being done, a portable ladder cannot be securely fastened in place, it shall, while being used, be sloped so that the base of the ladder is not less than one-quarter and not more than one-third of the length of the ladder from a point directly below the top of the ladder and at the same level as the base. Every portable ladder shall, while being used:

- a. be placed on a firm footing; and
- b. be secured in such a manner that it cannot be dislodged accidentally from its position

46. Every portable ladder that provides access from one level to another shall extend at least three rungs above the higher level.

47. Metal or wire-bound portable ladders shall not be used where there is a hazard that they may come into contact with any live electrical circuit or equipment.

48. No person shall work from any of the three top rungs of any single or extension portable ladder or from either of the two top steps of any portable step ladder.

Safety Nets

49. Where there is a hazard that tools, equipment or materials may fall onto or from a temporary structure, the department shall provide a protective structure or safety net to protect from injury any personnel on or below the temporary structure.

Rescue Plan

50. If a rescue is required while alongside in homeport, Dockyard Firehall is to be called immediately to initiate the rescue of a suspended casualty.

51. If a suspended casualty should happen away from homeport, then an in-house rescue team that has received competent training, proper equipment and practice on a regular schedule (i.e. monthly) would be competent to initiate and conduct a rescue. The condition and location of the suspended casualty will determine the method required to implement a rescue. Once the rescue plan is developed and approved by all stakeholders, the necessary equipment will be added to the ship's inventory.

52. After the rescue, the suspended casualty's FPE shall be quarantined until the completion of the investigation surrounding the fall. Once the investigation has been completed and no further action is required, the FPE shall be disposed of in the appropriate manner.

Communication

53. If any job poses a danger to other personnel, the OOD/OOW is to be notified immediately. The OOD/OOW shall make the appropriate pipe to warn all personnel onboard.

Warning Signs

54. If any job poses a danger to other personnel, warning signs shall be placed in a conspicuous place, and at a sufficient distance from the job to ensure the safety of other personnel. Upon completion of the job, all warning signs are to be removed.

Records

55. Records of all FPE are to be maintained by the holding unit including all items previously held on board and any new additions. Any new FPE shall be reported to the Formation representative. Training records shall be maintained for both supervisors and any other personnel who by job or position will be required to work at heights and use FPE. The duration of the qualification will be at the discretion of the applicable training vendor. Both the Unit Training Chief and FSE shall maintain copies of all training records. FPE records shall be maintained by the ship coordinator and the qualified Formation inspector.

Attachments

Annex S5A - Fall Protection Inventory List

SOP S8 – CONFINED SPACE ENTRY

References

- A. C-02-040-009/AG-001, General Safety Standards, Chapter 7 - Hazardous Confined Spaces Safety Standard
- B. C-03-005-033/AA-000, Naval Engineering Manual
- C. MARCORD 5-5, Employment of the MOS 00149 Fire Fighter Trade in Ships
- D. MARCORD 66-01 Annex G, General Safety Program - Gas Free Certification Program (Ships)
- E. Ship Standing Orders

Purpose

- 1. To provide direction to ensure that personnel entering a confined space are safe to do so.

Scope

- 2. This SOP applies to all personnel entering, and those responsible for personnel entering, a confined space.

Definitions

- 3. Confined Space - means an enclosed or partially enclosed space that:
 - a. is not designed or intended for human occupancy except for the purpose of performing work;
 - b. has restricted means of access and egress; and
 - c. may become hazardous to any person entering it owing to:
 - i. its design, construction, location or atmosphere,
 - ii. the materials or substances in it, or
 - iii. any other conditions relating to it.

Note: On board a ship, confined spaces can include all tanks, boiler drums, poorly ventilated bilges and cofferdams. Extreme caution is necessary when opening any such space. The contents of a closed compartment may over a period give off flammable or toxic vapours in sufficient quantities to become a threat to life, or they may consume the oxygen in the compartment. Even an empty compartment must be suspected, since many paints create similar dangers.

4. Confined Space Ship Repair - where the confined space relates to ships or vessels in repair, maintenance or refit, confined space means a storage tank, ballast tank, pump room, coffer dam or other enclosure, other than a hold, not designed or intended for human occupancy, except for the purpose of performing work:

- a. that has poor ventilation;
- b. where there may be an oxygen deficient atmosphere, or
- c. in which there may be an airborne dangerous substance.

5. Qualified personnel - means a person who is authorized to perform compartment safety certifications (provided they have the required qualification Level). They are:

- a. FMF General Safety and Environment Inspectors;
- b. Chief, First or Second Class Engineers in CFAVs that hold a Fourth Class Engineering Ticket;
- c. QL6 qualified Mar Eng Tech (MOSID 00367-2) in HMC Submarines;
- d. QL4 qualified MESO (MOSID 00225) in KINGSTON Class Vessels when Hull Techs (MOSID 00124) are not borne; and
- e. QL5 or above Hull Techs (MOSID 00124).

Note: Compartment safety certifications in HMC Ships are frequently contracted to non-DND contractors (e.g. KINGSTON Class maintenance). Non-DND inspectors are to possess an accredited civilian qualification IAW references B and D.

6. Safe To Enter - is described as being able to safely enter a previously confined space without the use of an air-purifying or supplied air (SAR/SCBA) respirator. The confined space would, however, need to be ventilated during entry to ensure an adequate supply of breathable air.

7. Safe For Hot Work - is described as being able to perform any type of hot work in an internal space without fear of working in an explosive atmosphere.

Responsibilities

8. FMF Safety reviews the technical components of the SOP. FMF Safety also supports ship training requirements.

9. Qualified personnel are to be used to certify that confined spaces are free from all dangers and are safe to enter. Alongside in homeport the FMF Safety and Environment Office issues the gas free certificate while the Senior Hull Technician may prove an area gas free away from homeport.

10. The MSEO/CEng or his delegated representative shall ensure the space has been properly flushed (if required), ventilated, tested safe by a qualified inspector, and the documentation is prepared and signed accordingly prior to anyone enters a confined space.

11. An officer or technician of the rank of PO2 or above will be in charge of any party opening or working in a confined space. The OOD/OOW is to be advised when the work commences and is complete.

General

12. Some confined spaces which are found in a ship, may include:

- a. empty tanks that have contained fuel, lube oil, or water;
- b. poorly-ventilated bilges;
- c. any other confined areas which have been closed for a period of time. A good example is the forepeak which, although open when entering and leaving harbour, can and will have dead air accumulated with time; and
- d. additionally, the paint curing process uses oxygen and some paints produce carbon monoxide, which means any newly-painted compartments must also be suspect.

Policies and Procedures

13. Ships In Home Port. Only personnel qualified and authorized (as defined in this SOP) shall perform compartment safety certifications in “Ships in Home Port”. Only a qualified Level III inspector shall conduct safety certification of compartments where FMF or other non-ship’s personnel will be working. For MARLANT ships, Annex S8B must be completed and forwarded 24 hours in advance to FMF Safety. Ships in MARPAC are to contact FMF Safety to schedule Gas Free prior to the commencement of work. Annex S8A is the ship’s form only. FMF will continue to use their own form and attach to Annex S8A.

14. Ships At Sea. In the absence of an individual qualified to Level III, the CO may authorize an individual qualified to Level II to issue a Confined Space Certificate (Annex S8A) for work by ship’s personnel in all compartments. COs may also authorize Level I qualified personnel to conduct post-emergency compartment “safe to enter” certification IAW reference D.

15. Ships Away From Home Port. “Ships Away from Home Port” shall implement the most stringent compartment safety certifications whether they are the local regulations or the policies and procedures implemented for “Ships at Sea.”

Personnel Qualifications

16. Personnel who perform "safe to enter" and "safe for hot work" certifications shall be qualified to the appropriate Level IAW reference D.

Precautions

17. Prior to opening a confined space, until it is ascertained with an approved gas detector that there are no explosive gases present:

- a. all naked lights within six (6) metres are removed;
- b. “No Smoking or Naked Lights” signs are to be prominently displayed; and
- c. the immediate area is to be roped off.

18. Unless the space has been properly vented and tested, personnel must not enter the space without approved breathing apparatus and a lifeline. The Confined Space sentry is not to enter the space, but shall remain in constant communication with the member(s) inside.

19. An explosion proof ventilation fan with discharge hose shall be used to ventilate with fresh air by taking suction from the bottom of the space and discharging to the upper deck. No person shall enter a confined space until the space has been properly flushed (if required), ventilated, and tested safe by a qualified inspector. Until testing has successfully been completed entry to the space shall have a sign posted outside the confined space entrance, stating “CAUTION! CONFINED SPACE VENTING - DO NOT ENTER -” to ensure personnel safety.

20. The ship shall retain a copy of the appropriate documents upon the successful completion of the gas free testing. Gas free testing along with a new Confined Space Certificate, must be conducted every 24 hours. Any system that terminates within a confined space is to be appropriately blanked prior to entering the space. Systems that are blanked should be recorded as part of the ship’s lockout/tagout program, as detailed in SOP S4 - Lockout/Tagout.

21. Before entering the confined space, the absence of flammable gas must be proved by using an approved gas detecting and indicating device. The presence of sufficient oxygen must be subsequently demonstrated. Proper PPE shall be worn for any person entering a confined space (e.g., eye and ear protection, and fall protection equipment).

22. When personnel are entering a confined space to test the air quality:

- a. they are to wear a positive pressure approved self contained breathing apparatus (SCBA);

- b. they are to wear a secure life-line which will be securely fastened outside the compartment;
- c. they are to be in constant communication with a supervisor that is in open air; and
- d. there is to be additional breathing apparatus and fire extinguishers outside the compartment for immediate use if required.

Note: Under no circumstance should a CHEMOX breathing apparatus be used in a confined space. The heat generated by a CHEMOX canister may be higher than the flash point of fumes in a tank that has contained petroleum products or sewage.

23. After a space has been confirmed “Safe To Enter” the following conditions must be met in order for personnel to work in the space:

- a. the “Pink” copy of the signed “Annex S8A - Confined Space Certificate” must be placed at the entrance to the Confined Space;
- b. a sentry is to be stationed outside the space, to log (on the back side of the form mentioned above) worker entries / exits and monitor their condition while inside;
- c. breathing apparatus and fire extinguishers must remain at the entrance to the space in case of emergency;
- d. establish and test communication device with the worker(s) prior to entry into the confined space and no less than every 20 minutes while work is being performed in the Confine Space;
- e. a confined space requires forced ventilation (positive exhaust) to the upper decks with the exhaust hose draped over the side to within two (2) meters of the waterline at all times. The ventilation system shall be equipped with an alarm or monitored by the sentry. If the ventilation equipment fails to operate, the sentry shall immediately inform the worker(s) and they shall exit the Confined Space area until proper ventilation is restored. If the conditions at the time of certification change in any manner or if at any time the atmosphere is suspect, re-testing of the compartment atmosphere must be conducted;
- f. sentry(s) shall not leave the entrance to a Confined Space, while worker(s) are inside, unless relieved by a person who has been briefed on the requirements of a confined space sentry (IAW Annex S8A – Confined Space Certificate, pg. S8A-2/2) by the Duty Tech/OOD or any other personnel listed in paragraph 5 of this SOP ;

- g. any required lighting must be an approved explosion proof light; and
- h. emergency procedures have been reviewed and understood by all those involved.

24. Ship staff shall ensure contractors adhere to all regulations as identified in the contract with the Contracting Authority.

Note: Contact FSE, for additional Confined Space Certificate Forms (FSES8A).

Emergency Procedures

25. Before proceeding to take care of a casualty, it must be assumed the casualty is down due to a poisoned atmosphere. The casualty-clearing personnel shall don SCBAs prior to entering a confined space, unless it is obvious the casualty is down for another reason.

26. Military Fire Fighters (FF) may have received training in many emergency responses related skills. They include hazardous material response, confined space and high angle rescue, respiratory protection and first aid training. At the direction of the ship's CO, FFs may be directed to perform these duties. The Senior FF should ensure his/her HOD is made aware of any unique capabilities and skills of FFs within the Engineering Department.

Training

27. Supervisors are to ensure that personnel detailed to enter a confined space are instructed and properly trained on all aspects of entering a confined space.

Records

28. Ship's shall forward all completed ship Confined Space Certificates, and FMF Ship Hot Work/Gas Free/Safe to Enter Chits to FMF Safety by the end of December. FMF Safety retains the completed certificates on file for 10 years.

Hot Work Certificate (Annex S7A)

Confined Space Certificate (Annex S8A)

Request for Gas Free Certification (Annex S8B)

Copies of completed FMF Ship Hot Work/Gas Free/Safe to Enter Chit

Attachments

Annex S8A - Confined Space Certificate

Annex S8B - Request for Gas Free Certification

SOP S5 – FALL PROTECTION AND ELEVATED STRUCTURES

References

- A. Canada Occupational Safety & Health Regulations Part XII
- B. National Safety Council - Accident Prevention Manual for Business and Industry - Edition 11, Chapter 6
- C. C-02-040-009/AG-001, Chapter 6 - Elevated Work Structures
- D. C-02-040-009/AG-001, Chapter 14 - PPE

Purpose

- 1. To provide direction to ensure that when personnel are put into a position where a fall from height is possible, the proper equipment and procedures are put into place.

Scope

- 2. This SOP applies to all personnel working at heights on board the ship.

Definitions

- 3. At Height - is defined as from an unguarded position, at a height of 2.4m and greater, above the nearest permanent safe level.
- 4. Elevated Work Structure - is a structure or device that is used as an elevated work base for persons or as an elevated platform for material and includes any scaffold, staging, walk-way, decking, bridge, boatswain's chair, tower, crawling board, temporary floor, any portable ladder or means of access or egress from any of the foregoing, and any safety net, landing-or other device used in connection with such a structure.
- 5. Fall Protection Equipment (FPE) - consists of a full body harness, a connecting system, and may include an improvised anchorage.
- 6. Fall Protection System - consists of a full body harness, a connecting system, an improvised anchorage point and a rescue plan.
- 7. Harness Hang Syndrome (Suspension Trauma) - occurs when a person is left hanging from a rope, immobile in a harness and can result in death. The effect of the harness leg straps may be likened to tourniquets above each thigh in certain circumstances (especially dorsal suspension in a fall arrest harness) and this may bring about a lack of venous blood return or compartmentalisation within the legs. The body's response may take the form of syncope (fainting / unconsciousness), toxin release within the legs and cardiac arrhythmia.

8. Mobile Elevated Work Structure - a vehicle-mounted aerial device, elevating rolling work platform, boom-type elevating work platform or self-propelled elevating work platform.
9. Person In Charge (Supervisor) - a qualified person appointed by management to ensure the safe and proper conduct of an operation or of the work of personnel.
10. Qualified Person - in respect of a specified duty, a person who because of their knowledge, training and experience is qualified to perform that duty safely and properly exercising Due Diligence.
11. Rescue Plan - a plan, which would utilize either a self-rescue technique or in-house personnel, trained and practiced in performing a rescue on a suspended casualty or an outside agency qualified to perform a rescue (DND Fire Department). The plan should be as simple as possible and started from the bottom up (it is always better to discover the anchor point will not hold while at deck level).
12. Safety Restraining Device - any equipment that is specifically designed to be used by a person or persons to protect or prevent falling while working at height, and includes any fitting, fastening or accessory thereto, such as, but not limited to, body belts, safety harnesses, seats, ropes, belts, straps and life-lines.
13. Suspended Casualty - a person who due to illness, injury or entanglement is incapable of getting down on his or her own from height.

Responsibilities/Duties

14. The CO is to ensure that FPE is properly maintained and controlled.
15. Normally the Deck Dept. will maintain all holdings of FPE. They are to ensure through regular inspections that FPE is suitable for use and are to maintain the Fall Protection Inventory List (Annex S5A) and ensure the Person Aloft Chits (DND 2145) are properly completed.
16. Normally the Chief Bos'n Mate will maintain and handle the rescue equipment and the Cox'n will act as On Scene Commander (OSC) for a rescue.
17. Organization - Prior to commencing the job, all personnel involved shall be qualified to perform the tasks expected of them and should include a Person In Charge/Supervisor and all other personnel required to carry out the task.
18. Supervisors are to ensure that personnel are instructed and properly trained on all aspects of Fall Protection/Fall Arrest including but not limited to the inspection, proper fitting and wearing, preventive maintenance and life of the FPE that they will employ.

Direction/Instruction

19. Fall hazards must first be identified and then controlled through engineering controls if feasible. When engineering controls are not feasible, then personal fall arrest systems, administrative controls and training must be instituted. Due to the inherent risks of working aloft onboard ships, factors such as motion, wind, waves, rain and emissions both exhaust and Radiation Hazard can and will significantly alter the conduct of the job. A thorough risk assessment must be carried out prior to commencement of the work and it is essential that all personnel involved in the work are involved in the planning.

Fall Protection Equipment

20. FPE is to be worn by all personnel working 2.4 meters above a permanent safe level. Only CSA approved FPE is to be used for working aloft. The user must inspect all FPE prior to its use. Typically KINGSTON Class ships hold 4 to 6 harnesses to conduct all operations. Normally stored in a central, dry and clean location.

21. Personnel requiring a harness are to draw one from the Deck Dept. Before receiving any FPE the person shall handover their Fall Protection Card, which is held by the Deck Dept until the harness is returned. The wearer is to inspect and properly adjust the harness with the Deck Dept member confirming the fit. Upon return of the harness, a Deck Dept member shall inspect the harness and return the member's Fall Protection Card.

Inspection

22. The annual inspection of FPE shall be conducted by the qualified Formation inspector (FSE at MARLANT or FMF at MARPAC) and before each use by the user. The harness and all connecting components shall be inspected for rips, burns, discoloration, chemicals, paint, and solvents. Hardware such as D rings, carabineers, buckles, snaps, and eyes must be inspected for possible scratches, cracks, tears, dents, etc. All FPE that fails inspection must be removed from service and reported to the appropriate supervisor. If required, replace the FPE before proceeding with the work and report the damaged FPE to the Deck Dept. The DeckO is to ensure that FPE that does not meet inspection or is greater than 10 years old is destroyed and replaced.

23. At no time shall alterations of any kind be carried out on any piece of FPE, including marking on, cutting, sewing, adding to or removing pieces..

Elevated Work Structures

24. No department shall permit the use of a temporary structure where it is reasonably practicable to use a permanent structure.

25. Departments shall ensure that each temporary work structure used by personnel is safe for use, and is used in a safe and proper manner.

26. Departments shall ensure that a qualified person visually inspects each temporary structure prior to each work shift to ensure, insofar as possible by such inspection, that it is safe to use and ensure that a record of each inspection is made by the person who carried out the inspection. Where an inspection reveals a defect or condition that adversely affects the structural integrity of a temporary structure, no personnel shall use the temporary structure until the defect or condition is remedied.

27. No person shall use a temporary structure unless:

- a. authority has been received from the person in charge to use it;
- b. the person has been trained and instructed in its safe and proper use; and
- c. the person, or the person in charge, visually inspects the structure prior to each work shift to ensure that it is safe to use.

28. Every person shall report to the person in charge, as soon as practicable any defect or condition in a temporary structure that may, in the opinion of that person, create a hazard. No personnel shall use any temporary structure that has a defect or condition that, in the opinion of that person, may endanger the person or any other personnel, until the structure has been examined by a qualified person and declared to be safe.

29. No personnel shall work on a temporary structure in rain, snow, hail or an electrical or wind storm that is likely to be hazardous to the safety or health of the person, except where the work is required to remove a hazard or to rescue another person. Every platform, hand-rail, guardrail and work area on a temporary structure shall be kept free of accumulations of ice and snow while the temporary structure is in use.

30. Guardrails and toe boards shall be installed at every open edge of the platform of a temporary structure. Every guardrail shall consist of:

- a. a horizontal top rail not less than 900 mm and not more than 1100 mm above the base of the guardrail;
- b. a horizontal intermediate rail spaced midway between the top rail and the base; and
- c. supporting posts spaced not more than 3 m apart at their centres.

31. Every guardrail shall be designed to withstand a static load of 890 N applied in any direction at any point on the top rail.

32. When guardrails or ladders are removed for any reason, temporary guardrails shall be rigged and a barrier erected at the top of the ladder. In addition, when escape hatches are left open an appropriate barrier shall be erected in front of the hatch

33. When there is a hazard that tools, equipment or materials may fall onto or from a temporary structure, a safety net shall be provided to protect from injury any personnel on or below the temporary structure.

34. Where a vehicle or a pedestrian may come into contact with a temporary structure, a person shall be positioned at the base of the temporary structure or a barricade shall be installed around it to prevent any such contact.

Paint Cats

35. When a ship is using a paint cat, the Deck Department is responsible to ensure it is inspected daily, prior to use. The OOD/SWK is responsible for ensuring the safety of personnel on the paint cat and should place someone in charge while on the paint cat. The OOD/SWK must also consider weather conditions, ship's movements and other yard and port activities that could affect personnel on the paint cat. Personnel on the paint cat shall wear PPE such as life jackets and FPE as required. Refer to SOP E6 - External Ship Husbandry for further environmental considerations.

Mobile Elevated Work Structures

36. Departments shall ensure that the design, construction, maintenance and use of every mobile elevated work structure shall comply as appropriate, with:

- a. CAN 3 B354.1-M82 Elevating Rolling Work Platforms;
- b. CAN 3 B354.2-M82 Self-Propelled Elevating Work Platforms for Use on Paved/Slab;
- c. CAN 3 B354.3-M82 Self-Propelled Elevating Work Platforms for Use as Off-Slab;
- d. CAN 3 B354.4-M82 Boom Type Elevating Work Platforms; and
- e. CSA C225-1976 Vehicle Mounted Aerial Devices.

37. Departments shall ensure, to the extent that is practicable, that where it is necessary to use or move a mobile elevated work structure with personnel on such a device, the person in charge ensures that the device is observed until it is no longer in use.

Temporary Stairs, Ramps and Platforms

38. Temporary stairs, ramps and platforms shall be capable of supporting at least four times the load that is likely to be imposed on it. Temporary stairs, ramps and platforms shall be designed, constructed and maintained to support any load that is likely to be imposed on them and to allow safe passage of persons and equipment on them.

39. Temporary stairs shall have uniform steps in the same flight:
- a. a slope not exceeding 1.2 to 1; and
 - b. a hand-rail that is not less than 900 mm and not more than 1100 mm above the stair level on open sides, including landings.
40. Temporary ramps and platforms shall be:
- a. securely fastened in place;
 - b. braced, if necessary, to ensure their stability; and
 - c. provided with cleats or surfaced in a manner that provides a safe footing for personnel.
41. A temporary ramp shall be so constructed that its slope does not exceed:
- a. where the temporary ramp is installed in the stairwell of a building not exceeding two storeys in height, 1 to 1, if cross cleats are provided at regular intervals not exceeding 300 mm; and
 - b. in any other case, 1 in 3.

Scaffolds

42. Departments shall ensure, that the design, construction and use of scaffolds meet the requirements of CSA Standard S269.2/M87, Access Scaffolds for Construction Purposes. Every scaffold shall be capable of supporting at least four times the load that is likely to be imposed on it. The platform of every scaffold shall be at least 480 mm wide and securely fastened in place. The footings and supports of every scaffold shall be capable of carrying, without dangerous settling, all loads that are likely to be imposed on them.
43. The erection, use, dismantling or removal of a scaffold shall be carried out by or under the supervision of a qualified person.

Portable Ladders

44. Only CSA approved portable ladders, appropriate to the task, that meet the Class 1 standard shall be used on board ship.
45. Where, because of the nature of the location or of the work being done, a portable ladder cannot be securely fastened in place, it shall, while being used, be sloped so that the base of the ladder is not less than one-quarter and not more than one-third of the

length of the ladder from a point directly below the top of the ladder and at the same level as the base. Every portable ladder shall, while being used:

- a. be placed on a firm footing; and
- b. be secured in such a manner that it cannot be dislodged accidentally from its position

46. Every portable ladder that provides access from one level to another shall extend at least three rungs above the higher level.

47. Metal or wire-bound portable ladders shall not be used where there is a hazard that they may come into contact with any live electrical circuit or equipment.

48. No person shall work from any of the three top rungs of any single or extension portable ladder or from either of the two top steps of any portable step ladder.

Safety Nets

49. Where there is a hazard that tools, equipment or materials may fall onto or from a temporary structure, the department shall provide a protective structure or safety net to protect from injury any personnel on or below the temporary structure.

Rescue Plan

50. If a rescue is required while alongside in homeport, Dockyard Firehall is to be called immediately to initiate the rescue of a suspended casualty.

51. If a suspended casualty should happen away from homeport then an in-house rescue team that has received competent training, proper FPE and practice on a regular schedule (i.e. monthly) would be competent to initiate and conduct a rescue. The condition and location of the suspended casualty will determine the method required to implement a rescue. Once the rescue plan is developed and approved by all stakeholders, the necessary FPE will be added to the ship's inventory.

52. After the rescue, the suspended casualty's FPE will be quarantined until the completion of the investigation surrounding the fall. Once the investigation has been completed and no further action is required the FPE shall be disposed of in the appropriate manner.

Communication

53. If any job poses a danger to other personnel the OOD/SWK is to be notified immediately. The OOD/SWK shall make the appropriate pipe to warn all personnel on board.

Warning Signs

54. If any job poses a danger to other personnel, warning signs shall be placed in a conspicuous place, and at a sufficient distance from the job to ensure the safety of other personnel. Upon completion of the job, all warning signs are to be removed.

Records

55. Records of all FPE are to be maintained by the holding unit including all items previously held on board and any new additions. Any new FPE shall be reported to the Formation representative. Training records shall be maintained for both supervisors and any other personnel who by job or position will be required to work at heights and use FPE. The duration of the qualification will be at the discretion of the applicable training vendor. Both the Unit Training Chief and FSE shall maintain copies of all training records. FPE records shall be maintained by the ship coordinator and the qualified Formation inspector.

Attachments

Annex S5A - Fall Protection Inventory List

SOP S8 – CONFINED SPACE ENTRY

References

- A. C-02-040-009/AG-001, General Safety Standards, Chapter 7 - Hazardous Confined Spaces Safety Standard
- B. C-03-005-033/AA-000, Naval Engineering Manual
- C. MARCORD 5-5, Employment of the MOS 00149 Fire Fighter Trade in Ships
- D. MARCORD 66-01 Annex G, General Safety Program - Gas Free Certification Program (Ships)
- E. Ship Standing Orders

Purpose

- 1. To provide direction to ensure that personnel entering a confined space are safe to do so.

Scope

- 2. This SOP applies to all personnel entering, and those responsible for personnel entering, a confined space.

Definitions

- 3. Confined Space - means an enclosed or partially enclosed space that:
 - a. is not designed or intended for human occupancy except for the purpose of performing work;
 - b. has restricted means of access and egress; and
 - c. may become hazardous to any person entering it owing to:
 - i. its design, construction, location or atmosphere,
 - ii. the materials or substances in it, or
 - iii. any other conditions relating to it.

Note: On board a ship, confined spaces can include all tanks, boiler drums, poorly ventilated bilges and cofferdams. Extreme caution is necessary when opening any such space. The contents of a closed compartment may over a period give off flammable or toxic vapours in sufficient quantities to become a threat to life, or they may consume the oxygen in the compartment. Even an empty compartment must be suspected, since many paints create similar dangers.

4. Confined Space Ship Repair - where the confined space relates to ships or vessels in repair, maintenance or refit, confined space means a storage tank, ballast tank, pump room, coffer dam or other enclosure, other than a hold, not designed or intended for human occupancy, except for the purpose of performing work:

- a. that has poor ventilation;
- b. where there may be an oxygen deficient atmosphere, or
- c. in which there may be an airborne dangerous substance.

5. Qualified personnel - means a person who is authorized to perform compartment safety certifications (provided they have the required qualification Level). They are:

- a. FMF General Safety and Environment Inspectors;
- b. Chief, First or Second Class Engineers in CFAVs that hold a Fourth Class Engineering Ticket;
- c. QL6 qualified Mar Eng Tech (MOSID 00367-2) in HMC Submarines;
- d. QL4 qualified MESO (MOSID 00225) in KINGSTON Class Vessels when Hull Techs (MOSID 00124) are not borne; and
- e. QL5 or above Hull Techs (MOSID 00124).

Note: Compartment safety certifications in HMC Ships are frequently contracted to non-DND contractors (e.g. KINGSTON Class maintenance). Non-DND inspectors are to possess an accredited civilian qualification IAW references B and D.

6. Safe To Enter - is described as being able to safely enter a previously confined space without the use of an air-purifying or supplied air (SAR/SCBA) respirator. The confined space would, however, need to be ventilated during entry to ensure an adequate supply of breathable air.

7. Safe For Hot Work - is described as being able to perform any type of hot work in an internal space without fear of working in an explosive atmosphere.

Responsibilities

8. FMF Safety reviews the technical components of the SOP. FMF Safety also supports ship training requirements.

9. Qualified personnel are to be used to certify that confined spaces are free from all dangers and are safe to enter. Alongside in homeport the FMF Safety and Environment Office issues the gas free certificate while the Senior Hull Technician may prove an area gas free away from homeport.

10. The CEng or his delegated representative shall ensure the space has been properly flushed (if required), ventilated, tested safe by a qualified inspector, and the documentation is prepared and signed accordingly prior to anyone enters a confined space.

11. An officer or technician of the rank of PO2 or above will be in charge of any party opening or working in a confined space. The OOD/ SWK is to be advised when the work commences and is complete.

General

12. Some confined spaces which are found in a ship, may include:

- a. empty tanks that have contained fuel, lube oil, or water;
- b. poorly-ventilated bilges;
- c. any other confined areas which have been closed for a period of time. A good example is the forepeak which, although open when entering and leaving harbour, can and will have dead air accumulated with time; and
- d. additionally, the paint curing process uses oxygen and some paints produce carbon monoxide, which means any newly-painted compartments must also be suspect.

Policies and Procedures

13. **Ships In Home Port.** Only personnel qualified and authorized (as defined in this SOP) shall perform compartment safety certifications in “Ships in Home Port”. The ISSC provides a completed gas-free certificate, which is attached to a copy of Annex S8A completed by the ship.

14. **Ships At Sea.** In the absence of an individual qualified to Level III, the CO may authorize an individual qualified to Level II to issue a Confined Space Certificate (Annex S8A) for work by ship’s personnel in all compartments. COs may also authorize Level I qualified personnel to conduct post-emergency compartment “safe to enter” certification IAW reference D.

15. **Ships Away From Home Port.** “Ships Away from Home Port” shall implement the most stringent compartment safety certifications whether they are the local regulations or the policies and procedures implemented for “Ships at Sea.”

Personnel Qualifications

16. Personnel who perform "safe to enter" and "safe for hot work" certifications shall be qualified to the appropriate Level IAW reference D.

Precautions

17. Prior to opening a confined space, until it is ascertained with an approved gas detector that there are no explosive gases present:

- a. all naked lights within six (6) metres are removed;
- b. “No Smoking or Naked Lights” signs are to be prominently displayed; and
- c. the immediate area is to be roped off.

18. Unless the space has been properly vented and tested, personnel must not enter the space without approved breathing apparatus and a lifeline. The Confined Space sentry is not to enter the space, but shall remain in constant communication with the member(s) inside.

19. An explosion proof ventilation fan with discharge hose shall be used to ventilate with fresh air by taking suction from the bottom of the space and discharging to the upper deck. No person shall enter a confined space until the space has been properly flushed (if required), ventilated, and tested safe by a qualified inspector. Until testing has successfully been completed entry to the space shall have a sign posted outside the confined space entrance, stating “CAUTION! CONFINED SPACE VENTING - DO NOT ENTER -” to ensure personnel safety.

20. The ship shall retain a copy of the appropriate documents upon the successful completion of the gas free testing. Gas free testing along with a new Confined Space Certificate, must be conducted every 24 hours. Any system that terminates within a confined space is to be appropriately blanked prior to entering the space. Systems that are blanked should be recorded as part of the ship’s lockout/tagout program, as detailed in SOP S4 - Lockout/Tagout.

21. Before entering the confined space, the absence of flammable gas must be proved by using an approved gas detecting and indicating device. The presence of sufficient oxygen must be subsequently demonstrated. Proper PPE shall be worn for any person entering a confined space (e.g., eye and ear protection, and fall protection equipment).

22. When personnel are entering a confined space to test the air quality:

- a. they are to wear a positive pressure approved self contained breathing apparatus (SCBA);
- b. they are to wear a secure life-line which will be securely fastened outside the compartment;

- c. they are to be in constant communication with a supervisor that is in open air; and
- d. there is to be additional breathing apparatus and fire extinguishers outside the compartment for immediate use if required.

Note: Under no circumstance should a CHEMOX breathing apparatus be used in a confined space. The heat generated by a CHEMOX canister may be higher than the flash point of fumes in a tank that has contained petroleum products or sewage.

23. After a space has been confirmed “Safe To Enter” the following conditions must be met in order for personnel to work in the space:

- a. the “Pink” copy of the signed “Annex S8A - Confined Space Certificate” must be placed at the entrance to the Confined Space;
- b. a sentry is to be stationed outside the space, to log (on the back side of the form mentioned above) worker entries / exits and monitor their condition while inside;
- c. breathing apparatus and fire extinguishers must remain at the entrance to the space in case of emergency;
- d. establish and test communication device with the worker(s) prior to entry into the confined space and no less than every 20 minutes while work is being performed in the Confine Space;
- e. a confined space requires forced ventilation (positive exhaust) to the upper decks with the exhaust hose draped over the side to within two (2) meters of the waterline at all times. The ventilation system shall be equipped with an alarm or monitored by the sentry. If the ventilation equipment fails to operate, the sentry shall immediately inform the worker(s) and they shall exit the Confined Space area until proper ventilation is restored. If the conditions at the time of certification change in any manner or if at any time the atmosphere is suspect, re-testing of the compartment atmosphere must be conducted;
- f. sentry(s) shall not leave the entrance to a Confined Space, while worker(s) are inside, unless relieved by a person who has been briefed on the requirements of a confined space sentry (IAW Annex S8A – Confined Space Certificate, pg. S8A-2/2) by the Duty Tech/OOD or any other personnel listed in paragraph 5 of this SOP;
- g. any required lighting must be an approved explosion proof light; and

- h. emergency procedures have been reviewed and understood by all those involved.

24. Ship staff shall ensure contractors adhere to all regulations as identified in the contract with the Contracting Authority.

Note: Contact FSE, for additional Confined Space Certificate Forms (FSES8A).

Emergency Procedures

25. Before proceeding to take care of a casualty, it must be assumed the casualty is down due to a poisoned atmosphere. The casualty-clearing personnel shall don SCBAs prior to entering a confined space, unless it is obvious the casualty is down for another reason.

Training

26. Supervisors are to ensure that personnel detailed to enter a confined space are instructed and properly trained on all aspects of entering a confined space.

Records

27. Ship's shall forward all completed ship Confined Space Certificates, and ISSC Ship Hot Work/Gas Free/Safe to Enter Chits to FMF Safety by the end of December. FMF Safety retains the completed certificates on file for 10 years.

Hot Work Certificate (Annex S7A)

Confined Space Certificate (Annex S8A)

Copies of completed ISSC Ship Hot Work/Gas Free/Safe to Enter Chit

Attachments

Annex S8A - Confined Space Certificate

DIRECTIVE #S6 – FALL PROTECTION

References

- A. Canada Occupational Safety & Health Regulations Part XII
- B. C-02-040-009/AG-001 General Safety Program, General Safety Standards, Chapters 6 & 14
- C. National Safety Council – Accident Prevention Manual for Business and Industry, Edition 11, Chapter 6

Purpose

- 1. To provide direction and assign responsibility for implementing the Fall Protection Directive to maximize the safety of all civilian and military personnel who may work at height.

Scope

- 2. This Directive applies to all MALANT integral and assigned lodger units under the jurisdiction of the Commander Maritime Forces Atlantic.

Definitions

- 3. **At Height:** An unguarded position, at a height of 2.4m, or greater, above the nearest permanent safe level.
- 4. **Elevated Work Structure:** A structure or device that is used as an elevated work base for persons or as an elevated platform for material and includes any scaffold, stage or staging, walk-way, decking, bridge, boatswain's chair, tower, crawling board, temporary floor, any portable ladder or means of access or egress from any of the foregoing, and any safety net, landing or other device used in connection with such a structure.
- 5. **Fall Protection System:** An anchorage point, a full body harness, a connecting system, and a rescue plan.
- 6. **Mobile Elevated Work Structure:** A vehicle-mounted aerial device, elevating rolling work platform, boom-type elevating work platform or self-propelled elevating work platform.
- 7. **Person in Charge (Supervisor):** A qualified person appointed by management to ensure the safe and proper conduct of all operations and activities.
- 8. **Qualified Person:** In respect of a specified duty, a person who because of their knowledge, training, and experience, is qualified to perform that duty safely and properly while exercising due diligence.

9. **Safety Restraining Device:** Any safety belt, safety harness, seat, rope, belt, strap or life-line specifically designed to be used by a person to protect or prevent falling while working at height, and includes every fitting, fastening or accessory thereto.

10. **Suspended Casualty:** A person who due to illness, injury or entanglement is incapable of getting down from height on his or her own.

11. **Rescue Plan:** A plan which would utilize either a self-rescue technique or in-house personnel trained and practiced in performing a rescue on a suspended casualty or an outside agency qualified to perform a rescue, such as DND Fire Department. The plan must be as simple as possible and start from the bottom up. N.B. It is better to discover the anchor point will not hold while at ground level.

12. **Harness-hang Syndrome:** This occurs when a person is left hanging immobile from a rope or in a harness and can result in death. The rope or harness leg straps may act as tourniquets above each thigh in certain circumstances, such as dorsal suspension in a fall arrest harness, and this may bring about a lack of circulation within the legs. The victim's potential responses include fainting/unconsciousness, toxin release within the legs and cardiac arrhythmia.

Responsibilities

13. Within MARLANT the Formation Safety Officer is the OPI for Fall Protection.

14. Within units - Prior to working at height, all personnel involved shall be qualified to perform the tasks expected of them and should include a Person In Charge/Supervisor and all other personnel required to carry out the work.

15. Unit GSOs are responsible for maintaining all holdings of Fall Protection Equipment. They are to ensure, through regular inspections, that equipment is suitable for use and are to maintain the Fall Protection Inventory List (Annex S6A) and ensure the Person-aloft Chits are properly completed. Form DND 2145 under NSN 7530-21-911-4739 is the Person Aloft/RF Radiate/Antenna Rotate Control Chit.

16. Supervisors are to ensure that personnel are instructed and properly trained on all aspects of Fall Protection/Fall Arrest including but not limited to; the inspection, proper fitting and wearing, preventive maintenance and life of the equipment that they will employ.

Direction

17. Fall hazards must first be controlled through engineering controls if feasible. When engineering controls are not feasible, then personal fall arrest systems, administrative controls and training must be instituted. A thorough risk assessment must be carried out prior to commencement of work at height, and it is essential that all personnel involved in the work are involved in the planning.

Fall Protection Equipment

18. Fall Protection Equipment, also referred to as a harness, is to be worn by all personnel working 2.4 meters above a permanent safe level. Harnesses shall be properly approved equipment suitable for the task at hand, inspected regularly and properly worn and used by workers.

19. Personnel requiring a harness are to draw one from the designated representative. Before receiving any equipment the person shall handover their Fall Protection Card, which is held by the UGSO until the harness is returned. The wearer is to inspect and properly adjust the harness with the UGSO confirming the fit. Upon return of the harness the UGSO shall inspect the harness and return the member's Fall Protection Card.

Inspection

20. Fall Protection Equipment shall be inspected once a year by a qualified person from Formation Safety and Environment (FSE) and before each use by the user. **THAT IS, SELF INSPECTION BEFORE EACH USE!** The inspection shall include but not be limited to the harness and all webbing looking for rips, burns, discoloration, chemicals, paint, solvents and examining hardware such as D rings, carabineers, buckles, snaps, and eyes looking for possible scratches, cracks, tears, dents, etc. If required, replace the PPE before proceeding with the work and report the damaged PPE to the UGSO. FSE is to ensure that PPE that does not meet inspection, or is greater than ten years old, is destroyed and replaced.

21. At no time shall alterations of any kind including; marking on, cutting, sewing, adding to or removing pieces, be carried out on any piece of equipment. All fall protection PPE is to be used as is from the manufacturer and only the manufacturer or their chosen representative shall make alterations.

Elevated Work Structures

22. No unit shall permit the use of a temporary structure where it is reasonably practicable to use a permanent structure.

23. Units shall ensure that each temporary work structure used by personnel is safe for use, and is used in a safe and proper manner.

24. Units shall ensure that a qualified person visually inspects each temporary structure prior to each work shift to ensure, insofar as possible by such inspection, that it is safe to use and ensure that a record of each inspection is made by the person who carried out the inspection. Where an inspection reveals a defect or condition that adversely affects the structural integrity of a temporary structure, no personnel shall use the temporary structure until the defect or condition is remedied

25. No person shall use a temporary structure unless:
- a. authority has been received from the person in charge to use it;
 - b. the person has been trained and instructed in its safe and proper use; and
 - c. the person, or the person in charge, visually inspects the structure prior to each work shift to ensure, insofar as possible by such inspection, that it is safe to use.
26. Every person shall report to the person in charge, as soon as practicable any defect or condition in a temporary structure that may, in the opinion of that person, create a hazard. No personnel shall use any temporary structure that has a defect or condition that, in the opinion of that person, may endanger the person or any other personnel, until the structure has been examined by a qualified person and declared to be safe.
27. No personnel shall work on a temporary structure in rain, snow, hail or an electrical or wind storm that is likely to be hazardous to the safety or health of the person, except where the work is required to remove a hazard or to rescue another person. Every platform, hand-rail, guardrail and work area on a temporary structure shall be kept free of accumulations of ice and snow while the temporary structure is in use.
28. Guardrails and toe boards shall be installed at every open edge of the platform of a temporary structure. Every guardrail shall consist of:
- a. a horizontal top rail not less than 900 mm and not more than 1100 mm above the base of the guardrail;
 - b. a horizontal intermediate rail spaced midway between the top rail and the base; and
 - c. supporting posts spaced not more than 3 m apart at their centres.
29. Every guardrail shall be designed to withstand a static load of 890 N applied in any direction at any point on the top rail.
30. When guardrails or ladders are removed for any reason, temporary guardrails shall be rigged and a barrier erected at the top of the ladder. In addition, when escape hatches are left open an appropriate barrier shall be erected in front of the hatch
31. When there is a hazard that tools, equipment or materials may fall onto or from a temporary structure, a safety net shall be provided to protect from injury any personnel on or below the temporary structure.

32. Where a vehicle or a pedestrian may come into contact with a temporary structure, a person shall be positioned at the base of the temporary structure or a barricade shall be installed around it to prevent any such contact.

Paint Cats

33. When a ship is using a paint cat, the Deck Department is responsible to ensure it is inspected daily, prior to use. The OOD is responsible for ensuring the safety of personnel on the paint cat and should place someone in charge while on the paint cat. The OOD must also consider weather conditions, ship's movements and other yard and port activities that could affect personnel on the paint cat. Personnel on the paint cat shall wear PPE such as life jackets, harnesses as required.

Mobile Elevated Work Structures

34. Units shall ensure that the design, construction, maintenance and use of every mobile elevated work structure shall comply as appropriate, with:

- a. CAN 3 B354.1-M82 Elevating Rolling Work Platforms;
- b. CAN 3 B354.2-M82 Self-Propelled Elevating Work Platforms for Use on Paved/Slab;
- c. CAN 3 B354.3-M82 Self-Propelled Elevating Work Platforms for Use as Off-Slab;
- d. CAN 3 B354.4-M82 Boom Type Elevating Work Platforms; and
- e. CSA C225-1976 Vehicle Mounted Aerial Devices.

35. Units shall ensure, to the extent that is practicable, that where it is necessary to use or move a mobile elevated work structure with personnel on such a device, the person in charge ensures that the device is observed until it is no longer in motion.

Temporary Stairs, Ramps and Platforms

36. Temporary stairs, ramps and platforms shall be capable of supporting at least four times the load that is likely to be imposed on it. Temporary stairs, ramps and platforms shall be designed, constructed and maintained to support any load that is likely to be imposed on them and to allow safe passage of persons and equipment on them.

37. Temporary stairs shall have uniform steps in the same flight:

- a. a slope not exceeding 1.2 to 1; and
- b. a hand-rail that is not less than 900 mm and not more than 1100 mm above the stair level on open sides, including landings.

38. Temporary ramps and platforms shall be:
- a. securely fastened in place;
 - b. braced, if necessary, to ensure their stability; and
 - c. provided with cleats or surfaced in a manner that provides a safe footing for personnel.
39. A temporary ramp shall be so constructed that its slope does not exceed:
- a. where the temporary ramp is installed in the stairwell of a building not exceeding two storeys in height, 1 to 1, if cross cleats are provided at regular intervals not exceeding 300 mm; and
 - b. in any other case, 1 in 3.

Scaffolds

40. Units shall ensure, to the extent that is practicable, that the design, construction and use of scaffolds meet the requirements of CSA Standard S269.2/M87, Access Scaffolds for Construction Purposes. Every scaffold shall be capable of supporting at least four times the load that is likely to be imposed on it. The platform of every scaffold shall be at least 480 mm wide and securely fastened in place. The footings and supports of every scaffold shall be capable of carrying, without dangerous settling, all loads that are likely to be imposed on them.
41. The erection, use, dismantling or removal of a scaffold shall be carried out by or under the supervision of a qualified person.

Portable Ladders

42. Only portable ladders that have manufactured commercially that meet the CSA standards shall be used.
43. Where, because of the nature of the location, or of the work being done, a portable ladder cannot be securely fastened in place, it shall, while being used, be sloped so that the base of the ladder is not less than one-quarter and not more than one-third of the length of the ladder from a point directly below the top of the ladder and at the same level as the base. Every portable ladder shall, while being used:
- a. be placed on a firm footing; and
 - b. be secured in such a manner that it cannot be dislodged accidentally from its position

44. Every portable ladder that provides access from one level to another shall extend at least three rungs above the higher level.

45. Metal or wire-bound portable ladders shall not be used where there is a hazard that they may come into contact with any live electrical circuit or equipment.

46. No person shall work from any of the three top rungs of any single or extension portable ladder or from either of the two top steps of any portable step ladder.

Rescue Plan

47. If a rescue is required while a ship is alongside in homeport, the Dockyard Fire Hall is to be called immediately to initiate the rescue of a suspended casualty to prevent Harness-hang Syndrome.

48. If a suspended casualty should happen on board a ship away from homeport then an in-house rescue team that has received competent training, proper equipment and practice on a regular monthly schedule is competent to initiate and conduct a rescue. The condition and location of the suspended casualty will determine the method required to implement a rescue. Once developed and approved by all stakeholders, the necessary equipment will be added to the ship's inventory.

Communication

49. If any work at height poses a danger to other personnel, then the UGSO in shore units and the OOD/OOW on board ships are to be notified immediately. The UGSO and/or OOD/OOW shall warn appropriate personnel in the unit/ship.

Warning Signs

50. If any job poses a danger to other personnel, warning signs shall be placed in a conspicuous place, and at a sufficient distance from the job to ensure the safety of other personnel. Upon completion of the job, all warning signs are to be removed.

Records

51. Records of all fall protection equipment are to be maintained by the holding unit. Any new equipment shall be reported to the FSE representative during their annual inspection. Training records shall be maintained for both supervisors and any other personnel who by job or position may be required to work at heights and use fall protection equipment. The duration of the qualification will be at the discretion of the applicable training organization. Both the Unit/ship and FSE shall maintain copies of all equipment inspections and training records.

Attachments

Annex S6A - Fall Protection Inventory

Enquiries

MARLANT, Formation Safety Officer (FSafeO): Tel. (902) 721-5471.

ANNEX S6A – FALL PROTECTION INVENTORY LIST

Serial #	Manufacturer	Equipment Type	Model #	Date Of Mfr.	Inspection Expiry

DIRECTIVE #S10 – CONFINED SPACE ENTRY SAFETY PROGRAM**References**

- A. Canada Labour Code, Part II COHS Regs Part XI, Confined Spaces;
- B. C-02-040-009/AG-001 General Safety Program, General Safety Standards, Ch. 7, Hazardous Confined Space Entry Standard;
- C. MARCORD 66-01, Annex F; and
- D. MARLANT SEMS Directive S#7, Safety Permit Program.

Purpose

- 1. To provide direction and assign responsibility for implementing the MARLANT Confined Space Entry Safety Program to maximize the safety of all civilian and military personnel.

Scope

- 2. This Directive applies to all MARLANT units including integral and assigned lodger units under the jurisdiction of the Commander Maritime Forces Atlantic. The Confined Space Entry Program regulates the entry of personnel and the conduct of hot work regarding confined spaces through the permit system described at reference D.

Definitions

- 3. **Confined Space:** An enclosed or partially enclosed space that:
 - a. is not designed or intended for human occupancy except for the purpose of performing work;
 - b. has restricted means of access and egress; and
 - c. may become hazardous to any person entering it owing to:
 - i. its design, construction, location or atmosphere,
 - ii. the materials or substances in it, or
 - iii. any other conditions relating to it.
- 4. **Safe to enter:** A confined space is safe to enter when it meets the following conditions, during the time a person is in the confined space:
 - a. the concentration of any chemical agent or combination of chemical agents in the confined space to which the person is likely to be exposed will not result in the exposure of the person to:

- i. a concentration of the chemical agent or combination of chemical agents in excess of Threshold Limit Values for the agent(s) as currently adopted by the American Conference of Government Hygienists;
 - ii. airborne chrysotile in excess of one fibre per cubic centimetre;
 - iii. a concentration of the chemical agent(s) of more than 50% of the Lower Explosives Limit (L.E.L.), or, if a source of ignition is present, to a maximum of 10% of the L.E.L. of the agent(s);
 - b. the concentration of airborne hazardous substances , other than chemical agents, in the confined space, is not hazardous to the health and safety of persons;
 - c. the percentage of oxygen in the atmosphere of the confined space is not less than 18% and not more than 23% by volume at normal atmospheric pressure;
 - d. any liquid in which the person could drown has been removed from the confined space;
 - e. any free flowing solid in which the person may become entrapped has been removed from the confined space;
 - f. all electrical and mechanical equipment that may present a hazard to the person has been disconnected from its power source, real, or residual, and has been locked out: and
 - g. the opening for entry into and exit from the confined space is sufficient to allow the safe passage of a person using protection equipment.
5. **Safe for hot work:** Hot work shall not be performed in any space that contains an explosive or flammable hazardous material in a concentration in excess of 10% of its lower explosive limit, or oxygen at a concentration in excess of 23%.
6. **Hot Work:** Any activity which has the potential of generating a source of ignition. Examples include but may not be limited to burning, welding and grinding or spark producing equipment.
7. **Qualified person:** A person who, because of knowledge, training and experience, is qualified to perform safely and properly the duties specified under this Directive for hazard assessment, entry procedures, emergency procedures and the issue of “Safe to enter” and “Safe for hot work” permits, see references C and D.
8. **Workshop:** The designated spaces where personnel can conduct hot work.

Responsibilities

9. The Formation Safety Officer is the OPI for MARLANT's Confined Space Entry Program.

Direction

10. Ships/Shore Units that may require personnel to enter confined spaces, and conduct hot work in such spaces, shall have documented Standard Operating procedures (SOPs) to ensure these activities are conducted safely and IAW references A and B. The SOP(s) shall detail:

- a. Roles and responsibilities of all personnel involved in the confined space safety program;
- b. The extent of confined space awareness training given to all personnel;
- c. the criteria used and training provided to qualify, and requalify the personnel who assess the risk of entry and issue confined space entry permits;
- d. the number of current qualified personnel in the ship/unit;
- e. the process used to ensure that a confined space is safe to enter and conduct hot work;
- f. the precautions used prior to opening a confined space;
- g. the PPE used and the circumstance of its use during confined space entry;
- h. the use of sentries;
- i. the use of forced air venting;
- j. the frequency of atmospheric testing, and response to out-of-specification readings;
- k. the availability of emergency response procedures and equipment;
- l. records management for training records and permits; and
- m. the confined spaces under the ship/unit's jurisdiction showing the hazard level.

Records

11. All of the following completed forms shall be retained as records by units, or FSE as applicable, for 30 years after the last date of entry:

- a. Confined space entry training; and
- b. Confined Space Entry/Hot Work Permits.

Enquiries

MARLANT, Formation Safety Officer (FSafeO): Tel. (902) 721- 5472

SOP S5 – FALL PROTECTION AND ELEVATED STRUCTURES

References

- A. Canada Occupational Safety & Health Regulations Part XII
- B. National Safety Council - Accident Prevention Manual for Business and Industry - Edition 11, Chapter 6
- C. C-02-040-009/AG-001, Chapter 6 - Elevated Work Structures
- D. C-02-040-009/AG-001, Chapter 14 - PPE

Purpose

- 1. To provide direction to ensure that when personnel are put into a position where a fall from height is possible, the proper equipment and procedures are put into place.

Scope

- 2. This SOP applies to all personnel working at heights on board the submarine.

Definitions

- 3. At Height - is defined as from an unguarded position, at a height of 2.4m and greater, above the nearest permanent safe level.
- 4. Elevated Work Structure - is a structure or device that is used as an elevated work base for persons or as an elevated platform for material and includes any scaffold, staging, walk-way, decking, bridge, boatswain's chair, tower, crawling board, temporary floor, any portable ladder or means of access or egress from any of the foregoing, and any safety net, landing-or other device used in connection with such a structure.
- 5. Fall Protection Equipment (FPE)- consists of a full body harness, a connecting system and may include an improvised anchorage
- 6. Fall Protection System - consists of a full body harness, a connecting system an improvised anchorage point and a rescue plan.
- 7. Harness Hang Syndrome (Suspension Trauma) - occurs when a person is left hanging from a rope, immobile in a harness and can result in death. The effect of the harness leg straps may be likened to tourniquets above each thigh in certain circumstances (especially dorsal suspension in a fall arrest harness) and this may bring about a lack of venous blood return or compartmentalisation within the legs. The body's response may take the form of syncope (fainting / unconsciousness), toxin release within the legs and cardiac arrhythmia.

8. Mobile Elevated Work Structure - a vehicle-mounted aerial device, elevating rolling work platform, boom-type elevating work platform or self-propelled elevating work platform.
9. Person In Charge (Supervisor) - a qualified person appointed by management to ensure the safe and proper conduct of an operation or of the work of personnel.
10. Qualified Person - in respect of a specified duty, a person who because of their knowledge, training and experience is qualified to perform that duty safely and properly exercising Due Diligence.
11. Rescue Plan - a plan, which would utilize either a self-rescue technique or in-house personnel, trained and practiced in performing a rescue on a suspended casualty or an outside agency qualified to perform a rescue (DND Fire Department). The plan should be as simple as possible and started from the bottom up (it is always better to discover the anchor point will not hold while at deck level).
12. Safety Restraining Device - any equipment that is specifically designed to be used by a person or persons to protect or prevent falling while working at height, and includes any fitting, fastening or accessory, such as, but not limited to, body belts, safety harnesses, seats, ropes, belts, straps and life-lines.
13. Suspended Casualty - a person who due to illness, injury or entanglement is incapable of getting down on his or her own from height.

Responsibilities/Duties

14. The CO is to ensure that FPE is properly maintained and controlled.
15. Normally the Combat Department Casing Officer (CASO) will maintain all holdings of Fall Protection Equipment. They are to ensure through regular inspections that equipment is suitable for use and are to maintain the Fall Protection Inventory List (Annex S5A) and ensure the Person Aloft Chits DND 2145 are properly completed.
16. Organization - Prior to commencing the job, all personnel involved shall be qualified to perform the tasks expected of them and should include a Person In Charge/Supervisor and all other personnel required to carry out the task.
17. Supervisors are to ensure that personnel are instructed and properly trained on all aspects of Fall Protection/Fall Arrest including but not limited to the inspection, proper fitting and wearing, preventive maintenance and life of the equipment that they will employ.

Direction/Instruction

18. Fall hazards must first be identified and then controlled through engineering controls if feasible. When engineering controls are not feasible, then personal fall arrest systems, administrative controls and training must be instituted. Due to the inherent risks of working aloft on board submarines, factors such as motion, wind, waves, rain and emissions both exhaust and Radiation Hazard can and will significantly alter the conduct of the job. A thorough risk assessment must be carried out prior to commencement of the work and it is essential that all personnel involved in the work are involved in the planning.

Fall Protection Equipment

19. FPE is to be worn by all personnel working 2.4 meters above a permanent safe level. Only CSA approved FPE is to be used for working aloft. The user must inspect all equipment prior to its use. Typically VICTORIA Class submarines hold 15 to 20 harnesses to conduct all operations. Normally stored in a central, dry and clean location.

20. Personnel requiring a harness are to draw one from the Combat Department CASO. Before receiving any equipment the person shall handover their Fall Protection Card, which is held by the CASO until the harness is returned. The wearer is to inspect and properly adjust the harness with the CASO confirming the fit. Upon return of the harness the CASO shall inspect the harness and return the member's Fall Protection Card.

Inspection

21. The annual inspection of FPE shall be conducted by the qualified Formation inspector (FSE in MARLANT or FMF in MARPAC) and before each use by the user. The FPE shall be inspected for rips, burns, discoloration, chemicals, paint, and solvents. Hardware such as D rings, carabineers, buckles, snaps, and eyes must be inspected for possible scratches, cracks, tears, dents, etc. All FPE that fails inspection must be removed from service and reported to the appropriate supervisor. If required, replace the FPE before proceeding with the work and report the damaged FPE to the CASO. The CASO is to ensure that FPE that does not meet inspection or is greater than 10 years old is destroyed and replaced.

22. At no time shall alterations of any kind be carried out on any piece of FPE, including marking on, cutting, sewing, adding to or removing pieces..

Elevated Work Structures

23. No department shall permit the use of a temporary structure where it is reasonably practicable to use a permanent structure.

24. Departments shall ensure that each temporary work structure used by personnel is safe for use, and is used in a safe and proper manner.

25. Departments shall ensure that a qualified person visually inspects each temporary structure prior to each work shift to ensure, insofar as possible by such inspection, that it is safe to use and ensure that a record of each inspection is made by the person who carried out the inspection. Where an inspection reveals a defect or condition that adversely affects the structural integrity of a temporary structure, no personnel shall use the temporary structure until the defect or condition is remedied.

26. No person shall use a temporary structure unless:

- a. authority has been received from the person in charge to use it;
- b. the person has been trained and instructed in its safe and proper use; and
- c. the person, or the person in charge, visually inspects the structure prior to each work shift to ensure, that it is safe for use.

27. Every person shall report to the person in charge, as soon as practicable any defect or condition in a temporary structure that may, in the opinion of that person, create a hazard. No personnel shall use any temporary structure that has a defect or condition that, in the opinion of that person, may endanger the person or any other personnel, until the structure has been examined by a qualified person and declared to be safe.

28. No personnel shall work on a temporary structure in rain, snow, hail or an electrical or wind storm that is likely to be hazardous to the safety or health of the person, except where the work is required to remove a hazard or to rescue another person. Every platform, hand-rail, guardrail and work area on a temporary structure shall be kept free of accumulations of ice and snow while the temporary structure is in use.

29. Guardrails and toe boards shall be installed at every open edge of the platform of a temporary structure. Every guardrail shall consist of:

- a. a horizontal top rail not less than 900 mm and not more than 1100 mm above the base of the guardrail;
- b. a horizontal intermediate rail spaced midway between the top rail and the base; and
- c. supporting posts spaced not more than 3 m apart at their centres.

30. Every guardrail shall be designed to withstand a static load of 890 N applied in any direction at any point on the top rail.

31. When guardrails or ladders are removed for any reason, temporary guardrails shall be rigged and a barrier erected at the top of the ladder. In addition, when escape hatches are left open an appropriate barrier shall be erected in front of the hatch.

32. When there is a hazard that tools, equipment or materials may fall onto or from a temporary structure, a safety net shall be provided to protect from injury any personnel on or below the temporary structure.

33. Where a vehicle or a pedestrian may come into contact with a temporary structure, a person shall be positioned at the base of the temporary structure or a barricade shall be installed around it to prevent any such contact.

Paint Cats

34. When a submarine is using a paint cat, the Combat Department is responsible to ensure it is inspected daily, prior to use. The OOD is responsible for ensuring the safety of personnel on the paint cat and should place someone in charge while on the paint cat. The OOD must also consider weather conditions, submarine’s movements and other yard and port activities that could affect personnel on the paint cat. Personnel on the paint cat shall wear PPE such as life jackets and FPE as required.

Mobile Elevated Work Structures

35. Departments shall ensure that the design, construction, maintenance and use of every mobile elevated work structure shall comply as appropriate, with:

- a. CAN 3 B354.1-M82 Elevating Rolling Work Platforms;
- b. CAN 3 B354.2-M82 Self-Propelled Elevating Work Platforms for Use on Paved/Slab;
- c. CAN 3 B354.3-M82 Self-Propelled Elevating Work Platforms for Use as Off-Slab;
- d. CAN 3 B354.4-M82 Boom Type Elevating Work Platforms; and
- e. CSA C225-1976 Vehicle Mounted Aerial Devices.

36. Departments shall ensure, to the extent that is practicable, that where it is necessary to use or move a mobile elevated work structure with personnel on such a device, the person in charge ensures that the device is observed until it is no longer in use.

Temporary Stairs, Ramps and Platforms

37. Temporary stairs, ramps and platforms shall be capable of supporting at least four times the load that is likely to be imposed on it. Temporary stairs, ramps and platforms shall be designed, constructed and maintained to support any load that is likely to be imposed on them and to allow safe passage of persons and equipment on them.

38. Temporary stairs shall have uniform steps in the same flight:
- a. a slope not exceeding 1.2 to 1; and
 - b. a hand-rail that is not less than 900 mm and not more than 1100 mm above the stair level on open sides, including landings.
39. Temporary ramps and platforms shall be:
- a. securely fastened in place;
 - b. braced, if necessary, to ensure their stability; and
 - c. provided with cleats or surfaced in a manner that provides a safe footing for personnel.
40. A temporary ramp shall be so constructed that its slope does not exceed:
- a. where the temporary ramp is installed in the stairwell of a building not exceeding two storeys in height, 1 to 1, if cross cleats are provided at regular intervals not exceeding 300 mm; and
 - b. in any other case, 1 in 3.

Scaffolds

41. Departments shall ensure, that the design, construction and use of scaffolds meet the requirements of CSA Standard S269.2/M87, Access Scaffolds for Construction Purposes. Every scaffold shall be capable of supporting at least four times the load that is likely to be imposed on it. The platform of every scaffold shall be at least 480 mm wide and securely fastened in place. The footings and supports of every scaffold shall be capable of carrying, without dangerous settling, all loads that are likely to be imposed on them.
42. The erection, use, dismantling or removal of a scaffold shall be carried out by or under the supervision of a qualified person.

Portable Ladders

43. Only CSA approved portable ladders, appropriate to the task, that meet the Class 1 standard shall be used on board the submarine.
44. Where, because of the nature of the location or of the work being done, a portable ladder cannot be securely fastened in place, it shall, while being used, be sloped so that the base of the ladder is not less than one-quarter and not more than one-third of the

length of the ladder from a point directly below the top of the ladder and at the same level as the base. Every portable ladder shall, while being used:

- a. be placed on a firm footing; and
- b. be secured in such a manner that it cannot be dislodged accidentally from its position

45. Every portable ladder that provides access from one level to another shall extend at least three rungs above the higher level.

46. Metal or wire-bound portable ladders shall not be used where there is a hazard that they may come into contact with any live electrical circuit or equipment.

47. No person shall work from any of the three top rungs of any single or extension portable ladder or from either of the two top steps of any portable step ladder.

Safety Nets

48. Where there is a hazard that tools, equipment or materials may fall onto or from a temporary structure, the department shall provide a protective structure or safety net to protect from injury any personnel on or below the temporary structure.

Rescue Plan

49. If a rescue is required while alongside in homeport, Dockyard Firehall is to be called immediately to initiate the rescue of a suspended casualty.

50. If a suspended casualty should happen away from homeport, then an in-house rescue team that has received competent training, proper equipment and practice on a regular schedule (i.e. monthly) would be competent to initiate and conduct a rescue. The condition and location of the suspended casualty will determine the method required to implement a rescue. Once the rescue plan is developed and approved by all stakeholders, the necessary equipment will be added to the submarine's inventory.

51. After the rescue, the suspended casualty's FPE shall be quarantined until the completion of the investigation surrounding the fall. Once the investigation has been completed and no further action is required the FPE shall be disposed of in the appropriate manner.

Communication

52. If any job poses a danger to other personnel the OOD/OOW is to be notified immediately. The OOD/OOW shall make the appropriate pipe to warn all personnel on board.

Warning Signs

53. If any job poses a danger to other personnel, warning signs shall be placed in a conspicuous place, and at a sufficient distance from the job to ensure the safety of other personnel. Upon completion of the job, all warning signs are to be removed.

Records

54. Records of all FPE are to be maintained by the holding unit including all items previously held on board and any new additions. Any new FPE shall be reported to the Formation representative. Training records shall be maintained for both supervisors and any other personnel who by job or position will be required to work at heights and use FPE. The duration of the qualification will be at the discretion of the applicable training vendor. Both the Unit Training Chief and FSE shall maintain copies of all training records. FPE records shall be maintained by the submarine and the qualified Formation inspector.

Attachments

Annex S5A - Fall Protection Inventory

SOP S8 – CONFINED SPACE ENTRY

References

- A. C-02-040-009/AG-001, General Safety Standards, Chapter 7 - Hazardous Confined Spaces Safety Standard
- B. C-03-005-033/AA-000, Naval Engineering Manual
- C. MARCORD 5-5, Employment of the MOS 00149 Fire Fighter Trade in Ships
- D. MARCORD 66-01 Annex G, General Safety Program - Gas Free Certification Program (Ships)
- E. VICTORIA Class Submarine Standing Orders (VCSSOs)

Purpose

- 1. To provide direction to ensure that personnel entering a confined space are safe to do so.

Scope

- 2. This SOP applies to all personnel entering, and those responsible for personnel entering, a confined space.

Definitions

- 3. Confined Space - means an enclosed or partially enclosed space that:
 - a. is not designed or intended for human occupancy except for the purpose of performing work;
 - b. has restricted means of access and egress; and
 - c. may become hazardous to any person entering it owing to:
 - i. its design, construction, location or atmosphere,
 - ii. the materials or substances in it, or
 - iii. any other conditions relating to it.

Note: On board a ship, confined spaces can include all tanks, boiler drums, poorly ventilated bilges and cofferdams. Extreme caution is necessary when opening any such space. The contents of a closed compartment may over a period give off flammable or toxic vapours in sufficient quantities to become a threat to life, or they may consume the oxygen in the compartment. Even an empty compartment must be suspected, since many paints create similar dangers.

4. Confined Space Ship Repair - where the confined space relates to ships or vessels in repair, maintenance or refit, confined space means a storage tank, ballast tank, pump room, coffer dam or other enclosure, other than a hold, not designed or intended for human occupancy, except for the purpose of performing work:

- a. that has poor ventilation;
- b. where there may be an oxygen deficient atmosphere, or
- c. in which there may be an airborne dangerous substance.

5. Qualified personnel - means a person who is authorized to perform compartment safety certifications (provided they have the required qualification Level). They are:

- a. FMF General Safety and Environment Inspectors;
- b. Chief, First or Second Class Engineers in CFAVs that hold a Fourth Class Engineering Ticket;
- c. QL6 qualified Mar Eng Tech (MOSID 00367-2) in HMC Submarines;
- d. QL4 qualified MESO (MOSID 00225) in KINGSTON Class Vessels when Hull Techs (MOSID 00124) are not borne; and
- e. QL5 or above Hull Techs (MOSID 00124).

Note: Compartment safety certifications in HMC Ships are frequently contracted to non-DND contractors (e.g. KINGSTON Class maintenance). Non-DND inspectors are to possess an accredited civilian qualification IAW references B and D.

6. Safe To Enter - is described as being able to safely enter a previously confined space without the use of an air-purifying or supplied air (SAR/SCBA) respirator. The confined space would, however, need to be ventilated during entry to ensure an adequate supply of breathable air.

7. Safe For Hot Work - is described as being able to perform any type of hot work in an internal space without fear of working in an explosive atmosphere.

Responsibilities

8. FMF Safety reviews the technical components of the SOP. FMF Safety also supports ship training requirements.

9. Qualified personnel are to be used to certify that confined spaces are free from all dangers and are safe to enter. Alongside in homeport the FMF Safety and Environment Office issues the gas free certificate while the Senior Hull Technician may prove an area gas free away from homeport.

10. The MSEO/CEng or his delegated representative shall ensure the space has been properly flushed (if required), ventilated, tested safe by a qualified inspector, and the documentation is prepared and signed accordingly prior to anyone enters a confined space.

11. An officer or technician of the rank of PO2 or above will be in charge of any party opening or working in a confined space. The OOD/OOW is to be advised when the work commences and is complete.

General

12. Some confined spaces which are found in a ship, may include:

- a. empty tanks that have contained fuel, lube oil, or water;
- b. poorly-ventilated bilges;
- c. any other confined areas which have been closed for a period of time. A good example is the forepeak which, although open when entering and leaving harbour, can and will have dead air accumulated with time; and
- d. additionally, the paint curing process uses oxygen and some paints produce carbon monoxide, which means any newly-painted compartments must also be suspect.

Policies and Procedures

13. **Ships In Home Port.** Only personnel qualified and authorized (as defined in this SOP) shall perform compartment safety certifications in “Ships in Home Port”. Only a qualified Level III inspector shall conduct safety certification of compartments where FMF or other non-submarine personnel will be working. For MARLANT submarines, Annex S8B must be completed and forwarded 24 hours in advance to FMF Safety. Submarines in MARPAC are to contact FMF Safety to schedule Gas Free prior to the commencement of work. Annex S8A is the submarine’s form only. FMF will continue to use their own form and attach to Annex S8A.

14. **Ships At Sea.** In the absence of an individual qualified to Level III, the CO may authorize an individual qualified to Level II to issue a Confined Space Certificate (Annex S8A) for work by submarine’s personnel in all compartments. COs may also authorize Level I qualified personnel to conduct post-emergency compartment “safe to enter” certification IAW reference D.

15. **Ships Away From Home Port.** “Ships Away from Home Port” shall implement the most stringent compartment safety certifications whether they are the local regulations or the policies and procedures implemented for “Ships at Sea.”

Personnel Qualifications

16. Personnel who perform "safe to enter" and "safe for hot work" certifications shall be qualified to the appropriate Level IAW reference D.

Precautions

17. Prior to opening a confined space, until it is ascertained with an approved gas detector that there are no explosive gases present:

- a. all naked lights within six (6) metres are removed;
- b. “No Smoking or Naked Lights” signs are to be prominently displayed; and
- c. the immediate area is to be roped off.

18. Unless the space has been properly vented and tested, personnel must not enter the space without approved breathing apparatus and a lifeline. The Confined Space sentry is not to enter the space, but shall remain in constant communication with the member(s) inside.

19. An explosion proof ventilation fan with discharge hose shall be used to ventilate with fresh air by taking suction from the bottom of the space and discharging to the upper deck. No person shall enter a confined space until the space has been properly flushed (if required), ventilated, and tested safe by a qualified inspector. Until testing has successfully been completed, entry to the space shall have a sign posted outside the confined space entrance, stating “CAUTION! CONFINED SPACE VENTING - DO NOT ENTER -” to ensure personnel safety.

20. The submarine shall retain a copy of the appropriate documents upon the successful completion of the gas free testing. Gas free testing along with a new Confined Space Certificate, must be conducted every 24 hours. Any system that terminates within a confined space is to be appropriately blanked prior to entering the space. Systems that are blanked should be recorded as part of the submarine’s lockout/tagout program, as detailed in SOP S4 - Lockout/Tagout.

21. Before entering the confined space, the absence of flammable gas must be proved by using an approved gas detecting and indicating device. The presence of sufficient oxygen must be subsequently demonstrated. Proper PPE shall be worn for any person entering a confined space (e.g., eye and ear protection, and fall protection equipment).

22. When personnel are entering a confined space to test the air quality:

- a. they are to wear a positive pressure approved self contained breathing apparatus (SCBA);

- b. they are to wear a secure life-line which will be securely fastened outside the compartment;
- c. they are to be in constant communication with a supervisor that is in open air; and
- d. there is to be additional breathing apparatus and fire extinguishers outside the compartment for immediate use if required.

23. After a space has been confirmed “Safe To Enter” the following conditions must be met in order for personnel to work in the space:

- a. the “Pink” copy of the signed “Annex S8A - Confined Space Certificate” must be placed at the entrance to the Confined Space;
- b. a sentry is to be stationed outside the space, to log (on the back side of the form mentioned above) worker entries / exits and monitor their condition while inside;
- c. breathing apparatus and fire extinguishers must remain at the entrance to the space in case of emergency;
- d. establish and test communication device with the worker(s) prior to entry into the confined space and no less than every 20 minutes while work is being performed in the Confine Space;
- e. a confined space requires forced ventilation (positive exhaust) to the upper decks with the exhaust hose draped over the side to within two (2) meters of the waterline at all times. The ventilation system shall be equipped with an alarm or monitored by the sentry. If the ventilation equipment fails to operate, the sentry shall immediately inform the worker(s) and they shall exit the Confined Space area until proper ventilation is restored. If the conditions at the time of certification change in any manner or if at any time the atmosphere is suspect, re-testing of the compartment atmosphere must be conducted;
- f. sentry(s) shall not leave the entrance to a Confined Space, while worker(s) are inside, unless relieved by a person who has been briefed on the requirements of a confined space sentry (IAW Annex S8A – Confined Space Certificate, pg. S8A-2/2) by the Duty Tech/OOD or any other personnel listed in paragraph 5 of this SOP;
- g. any required lighting must be an approved explosion proof light; and
- h. emergency procedures have been reviewed and understood by all those involved.

24. Submarine staff shall ensure contractors adhere to all regulations as identified in the contract with the Contracting Authority.

Note: Contact FSE, for additional Confined Space Certificate Forms (FSES8A).

Emergency Procedures

25. Before proceeding to take care of a casualty, it must be assumed the casualty is down due to a poisoned atmosphere. The casualty-clearing personnel shall don SCBAs prior to entering a confined space, unless it is obvious the casualty is down for another reason.

Training

26. Supervisors are to ensure that personnel detailed to enter a confined space are instructed and properly trained on all aspects of entering a confined space.

Records

27. Submarines shall forward all completed Confined Space Certificates, and FMF Ship Hot Work/Gas Free/Safe to Enter Chits to FMF Safety by the end of December. FMF Safety retains the completed certificates on file for 10 years.

Hot Work Certificate (Annex S7A)

Confined Space Certificate (Annex S8A)

Request for Gas Free Certification (Annex S8B)

Copies of completed FMF Ship Hot Work/Gas Free/Safe to Enter Chit

Attachments

Annex S8A - Confined Space Certificate (Sample)

Annex S8B - Request for Gas Free Certification