

FALL ARREST POINTS SPECIFICATIONS

NGCC PIERRE RADISSON | RIVER-CLASS ICEBREAKER



For



Pêches et Océans
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Fall Arrest Points Specifications

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Table of Contents

1	General Notes.....	1
1.1	Scope	1
1.2	Terms and Definitions.....	1
1.3	Reference	2
1.3.1	General	2
1.3.2	Normative	2
2	Work on board.....	3
2.1	General Notes.....	Erreur ! Signet non défini.
2.2	Scope of Work	3
2.2.1	Deck Work	3
2.2.2	Work on Masts	3
2.2.3	Work on Equipment.....	3
2.2.4	Interior Work	4
3	General System Information.....	4
3.1	Worker Using a Fall Arrest System.....	5
3.2	Types of Systems	5
3.3	Fall Clearance.....	5
3.4	Material	5
3.5	Inspection and Maintenance	6
3.6	Safe Access to and Egress from the System.....	6
3.7	Environmental Limitations.....	6
4	Active Fall Arrest Systems.....	6
4.1	Self-retracting Lifeline.....	7
4.1.1	Components	7
4.1.2	Assembly and Installation	7
4.2	Rigid Anchoring Sub System	7

4.2.1	Components	7
4.2.2	Assembly & Installation	8
4.3	Displacement Limitation Systems	8
4.3.1	Components	8
4.3.2	Assembly & Installation	8
5	Testing	8
6	Rescue plan.....	Erreur ! Signet non défini.

1 General Notes

1.1 Scope

The intent of this specification is for the Contractor to build and install fall-arrest attachments on board of the NGCC Pierre Radisson.

Refer to the drawings C16-45-160-03 *Aménagement des Systèmes* and C16-45-160-04 *Détails et Installation des Systèmes* for the location and details of the different systems to be installed.

1.2 Terms and Definitions

Active fall protection system: a fall protection device that requires special precautions to be taken by workers, including the wearing (or use) of personal protective equipment for fall protection and observation of prescribed procedures. Examples: movement limitation systems and fall arrest systems.

Fall protection system: a secondary system that prevents workers from falling or that, in the event of a fall, stops the fall. Examples include safety guardrails, movement limitation systems, safety nets and fall arrest systems.

Passive fall protection system: a fall protection device where it is not necessary for workers to wear or use fall protection equipment or have special knowledge or skills for this system. Examples: railing systems and nets.

1.3 Reference

1.3.1 General

- Prochute, Evaluation Report Ref.14-7401 (NGCC DES GROSEILLIERS)
- Canadian Coast Guard, Fall Protection Program Part III-Applicable on Board Ships, CA-013-000-QM-GL-006

1.3.2 Normative

- CAN/CSA-Z259.16-04 (R2009)
Design of active fall protections systems
- CSA S16-14
Design of steel structures
- CAN/CSA-Z259.1-95 (R1999)
Safety belts of the tongue buckle type and lanyards
- CAN/CSA-Z259.2.1-98 (R2004)
Fall Arresters, Vertical Lifelines, and Rails
- CAN/CSA-Z259.2.2-98 (R2004)
Self-Retracting Devices for Personal Fall Arrest Systems
- CAN/CSA-Z259.10-M90 (confirmée en 2003)
Full Body Harnesses
- CAN/CSA-Z259.11-M92 (R2003)
Shock Absorbers for Personal Fall Arrest Systems
- CAN/CSA-Z259.12-01
Connecting Components for Personal Fall Arrest Systems (PFAS)
- CAN/CSA-Z259.15-12
Anchor Connectors

2 Work on board

2.1 Scope of Work

Refer to drawing C16-45-160-03 *Aménagement des Systèmes* for the location of different items aboard the vessel. All details and pages quoted hereafter will refer to drawing C16-45-160-04 *Détails et Installation des Systèmes*.

2.1.1 Deck Work

Lugs will need to be welded to Flight & Boat deck, under lifeboat, in accordance with page 4.

Three (3) stanchions will need to be welded on the diaphragm plate, on top of main funnel, in accordance with page 6.

2.1.2 Work on Masts

Forward Mast:

Access ladders to platforms will need to be reinforced, in accordance with typical details 3-B2 and 3-D2.

The antennas supports will need to be welded in accordance with section 5-B4.

Brackets will need to be added to port and starboard antenna support of the platform in accordance with detail 5-B8.

Lugs will need to be welded to all 4 antenna supports of top platform, in accordance with page 5.

Aft Mast:

A self-retractable life line system will need to be installed at the top of aft mast, in accordance with page 10 and 11. A string will be permanently attached to this life line to permit pulling life line towards the bottom of the ladder. Actual structures have to be modified in accordance with pages 10 and 11.

New lugs will need to be welded at the top of mast, as noted on pages 10 and 11.

2.1.3 Work on Equipment

A series of lugs will need to be installed, in accordance with page 7, on:

- fast rescue boat davit
- port and starboard landing barge davits

The crane ladders shall be modified, in accordance to page 8 & 9, for each of the four (4) cranes. Two (2) vertical support bars will need to be welded to the existing ladder. The step installed on top of the crane will be removed. A guard rail will need to be installed on top of the actual ladder to create an anchoring point, as illustrated on the drawing. Two (2) rigid anchoring lugs will be installed on the arms of each of the 4 cranes. The hydraulic oil reservoir will have been emptied, cleaned and gas freed.

2.1.4 Interior Work

At the entrance of the helicopter fuel pumping room, an anchoring lug for a vertical self-retracting life line will be welded, in accordance with detail 1-D4. This lug will need to be welded at the position indicated on the following picture. The light have to be relocated in order to free space for the anchoring lug in accordance with Figure 1. The anchoring lug have to be welded on the actual structure aligned with the axis of the ladder.

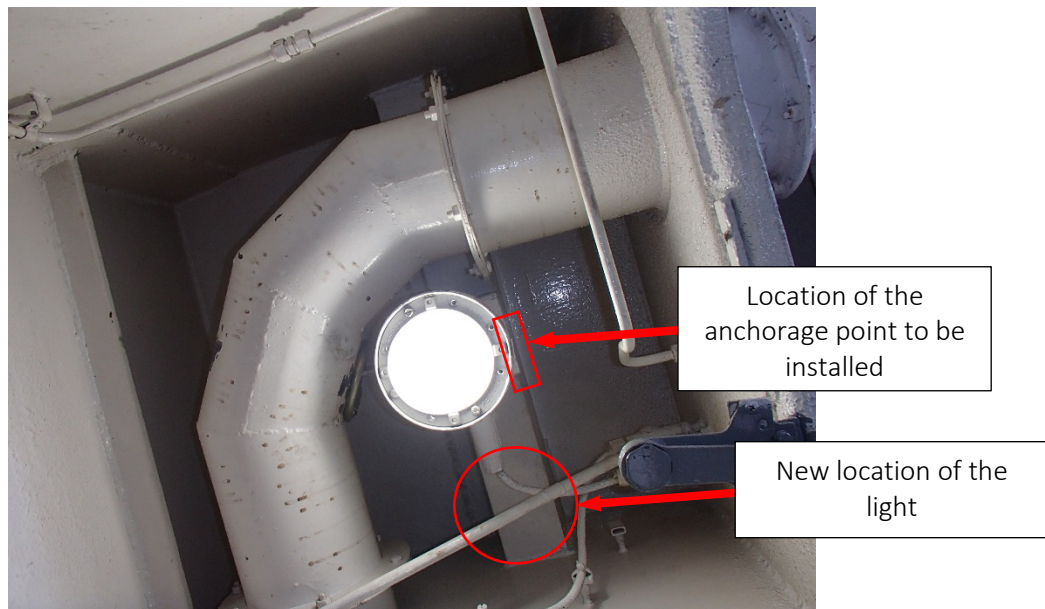


Figure 1 Installation of the lug of the helicopter fuel pumping room

3 General System Information

This specification doesn't replace the manufacturer's instructions for each component of the fall arrest system. The workers or the user must read, understand and respect the manufacturer's instructions for each equipment.

The manufacturer's instructions must be respected for a proper use and maintenance of each component of the fall-arrest systems.

3.1 Worker Using a Fall Arrest System

All workers who work in height will have previously followed training at the end of which they will be in possession of a license "working at height". During this training, they will have learned the requirements for protection against falls, in particular how to use and check the fall-arrest systems.

The worker shall be correctly equipped with full body harness adapted to his morphology and his weight, according to CSA Standard Z259.10.

The maximum weight of the workers with his tools is 140 kg (300 lbs) and his minimum weight is 45kg (100 lbs). If the weight of the fully equipped worker is more than 115 kg (254 lbs), he shall use a lanyard with integral energy absorber class E6.

3.2 Types of Systems

Different types of systems have to be installed:

- Self-retracting life line
- Rigid anchoring sub-system
- Displacement limitation system

The conception of these systems is conforming to the norm *Z259.16-04 norms: Design of active fall protection systems*.

3.3 Fall Clearance

The necessary fall clearance for each system depends on component uses: lanyard length, energy absorber elongation and anchorage point location (accessible area).

This clearance is illustrated for each of the systems on the drawing C16-45-160-04 *Détails et Installation des Systèmes*.

3.4 Material

The charge carrier component of active protection systems against fall arrest must be made of synthetic materials or metal. Fibers and organic materials could be used for non-load bearing component only.

Metal or synthetic materials (except for plastic composites like fiberglass) must have an elongation of at least 10% before failure in the environment in which they will be exposed.

3.5 Inspection and Maintenance

Each component of the fall-protection system must be inspected and maintained following the manufacturer's instructions.

The anchor points shall be regularly inspected and recoated if necessary to limit the corrosion action. This inspection will be added in the four-year plan of the verification of deck equipment. The choice of colour for signaling the anchor point is left up to the Coast Guard but shall be easily spotted.

3.6 Safe Access to and Egress from the System

Qualified workers for working at heights will have first been trained on how to use all the different fall arrest systems and on all the procedures for safe access and egress of these systems.

All alteration, inappropriate utilization of the system or any of its components, including non-respect of operational instructions could cause serious harm, or even death.

Particular attention shall be brought to all lug connectors (snap hook, hooks, and rings). All these connectors shall be compatible with all other fall arrest systems and parts utilized on the vessel. They must be compatible principally by size, shape and resistance. All non-compatible connectors can disengage accidentally and cause severe injury.

3.7 Environmental Limitations

Use of this equipment in areas with environmental hazards may require additional precautions to prevent injury to the user or damage to the equipment. Hazards may include, but are not limited to; heat, chemicals, corrosive environments, high voltage power lines, gases, moving machinery, and sharp edges.

Refer to manufacturer's instruction of each component in case of exposure to one of the risk factors mentioned above or any other.

4 Active Fall Arrest Systems

In these paragraphs concerning the description of active fall arrest systems, it is understood that the worker is already equipped with a safety harness and abides to all criteria listed in section 3.1.

4.1 Self-retracting Lifeline

4.1.1 Components

Self-retracting life line systems are composed of:

- Anchoring lug with a minimum capacity of 22.2 kN (5000 lbs)
- A self-retracting life line that complies with CSA Z259-2.2-98 standard
- A snap hook that complies with CSA Z259.15-12 standard, with a minimum capacity of 22.2 kN (5000 lbs)

The self-retractable life line that will be used at the helicopter fuel pumping room compartment entrance shall have a length of 16 meters (53 feet), galvanized steel construction, ANSI Z359.1-2007 standard. This unit has a maximum stopping force of 6 kN (1350 lbs) and a maximum stopping distance of 1.4 meters (54 inches).

See pages 10 and 11 of drawing for more information about installed life line on aft mast.

4.1.2 Assembly and Installation

The self-retracting life line installed at the entrance of helicopter fuel pumping room compartment entrance will be installed on the new anchoring lug, via the life line connector. The new anchoring lug will need to be welded on the existing structure, as per drawing C16-45-160-04 *Détails et Installation des Systèmes* (detail 1-D4) and in the position indicated at paragraph 2.2.4 of this specification.

See pages 10 & 11 of drawing for more information concerning the life line installed on aft mast.

4.2 Rigid Anchoring Sub System

4.2.1 Components

The Rigid Anchoring Sub System is comprised of:

- A 1.2 meter Y shaped safety tether, equipped with a shock absorption unit that complies with CSA Z259.11 standard
- A designated anchoring lug with a minimum capacity of 22.2 kN

The recommended safety tether has shock absorption with integral fastening. The tether shall be of a maximum length of 1.2 meters (4 feet), with a maximum stopping force of 6 kN (1.350 lbs), and maximum elongation of 1.2 m (4 ft). Please refer to paragraph 3.1, if total weight of worker is more than 115 kg (254 lbs).

Please refer to drawing C16-45-160-04 *Détails et Installation des Systèmes* for further explanations on structural elements used as anchoring lugs.

4.2.2 Assembly & Installation

The worker will need to install the tether on his harness, in accordance with Supplier's instructions and previous Working at Heights training.

The worker will then need to latch on to the designated anchoring lugs. The worker shall never work above his anchoring lug level, as this would increase the free fall distance. When climbing ladders, the worker shall always try to hook on to lugs as high as possible.

The worker shall hook on to the anchoring lugs in a safe manner.

4.3 Displacement Limitation Systems

4.3.1 Components

Displacement Limitations systems are composed of:

- An anchoring lug with a minimal capacity of 1.8 kN (400 lbs)
- A simple or Y shaped security tether that complies with CSA Z259.11 standard

The accepted tethers shall measure 1.2m (4 ft). The tether characteristics are given in paragraph 4.2.1.

Refer to drawing C16-45-160-04 *Détails et Installation des Systèmes* for structural element definitions that could be used as anchoring elements.

4.3.2 Assembly & Installation

The tether type and anchoring point are stipulated on the associated drawing for each position where a fall arrest system is required.

The worker will need to install himself his tether on the D ring on his harness, in conformity with Suppliers instructions and training that he previously received.

The worker will then need to hook on to designated anchoring lugs.

5 Testing

All fall arrest system components are individually tested, using load tests, by the Manufacturers.

All described systems included in the drawings supplied with the specification that comprise their respective components, must be periodically load tested. These tests will not cause permanent deformation of any system component, but must represent an actual free fall case.

The contractor must perform a load test for each system and produce reports of tests performed including the date of the tests performed and their results.

All the systems shall be load tested before their use.