

Canadian Food Inspection Agency

Vancouver / Prince Rupert Ship Inspectors

Fall Protection and Rescue Manual

2014

Table of Contents

1. Warnings	3
2. Introduction	3
3. Training	4
3.1 Initial Training	5
3.2 On-the-Job Training	5
3.3 In-house Training	5
3.4 Formal Training & Skills Verification	6
4. Fall Protection & Rescue Equipment	6
4.1 Full Body Harness	6
4.2 Belay Line (Rope)	6
4.3 Belay Device	6
4.4 Energy Absorbing Lanyard	6
4.5 Personal Equipment	6
4.6 Pulleys	6
4.7 Carabiners	6
4.8 Anchorage Connectors	6
4.9 Ascenders (Progress Capture Devices)	6
4.10 Descenders	6
4.11 Rescue Subject Packaging	6
4.12 Block & Tackle	6
4.13 Helmet	6
4.14 Abrasion Protection	6
4.15 Anchor Plate	6
4.16 Work Positioning Lanyard	7
4.17 Tagline Rope	7
4.18 Rope Lanyard	7
5. Fall Protection Procedures	7
5.1 Climbing and Traversing with Energy Absorbing Lanyard	7
5.2 Belaying in Hold (Enter / Exit)	8
5.3 Side Frame Inspection	11
5.4 High Angled Hopper Tank Inspection	13
6. Rescue Procedures	15
6.1 Lowering on Belay	16
6.2 Assisted Rescue Using Block & Tackle	16
6.3 Re-Directed Hauling System	19
6.4 Removal from Vessel	21
7. Appendices & Illustrations	
7.1 Appendix A – Inspector Sign-off	
7.2 Figure A – Belay System	
7.3 Figure B – Side Frame Inspection	
7.4 Figure B1 – Side Frame Inspection	
7.5 Figure B2 – High Angle Hopper Tanks	
7.6 Figure C – Assisted Rescue Using Block & Tackle	
7.7 Figure D – Re-Directed Hauling System	

1. Warnings

Fall protection training and fall protection services provided by Gravitec Systems, Inc., does not include training on the means and methods of the Canadian Food Inspection Agency's (CFIA) work. Gravitec Systems, Inc., training includes how to use fall protection and rescue equipment, but it does not include how to integrate fall protection equipment and rescue into CFIA's work location or practices. CFIA recognizes that it is their responsibility to direct their employees to select fall protection equipment, identify anchorages and determine the most applicable rescue methods. Gravitec Systems, Inc., is not at the CFIA location, has no ability or authority to direct the Clients employees, and makes no claims to fully understand the means and methods of the CFIA specific work practices. It is the sole responsibility of the CFIA to determine that the work structure is safe to work upon; where the employee travels; what fall protection system should be used; how the employee conducts their work; what structure can be used as anchorage(s); what the specific rescue plan is; and when fall protection equipment is unsafe to use. CFIA understands that Gravitec Systems, Inc., is not liable for the actions of the CFIA employees.

There are an infinite number of areas where a ship inspector may have to travel to conduct an inspection and an even greater number of anchorages and methods to install and use this equipment. Although this document has attempted to capture all of the relevant areas and equipment being used, it is inevitable that ship designs will change and there will be areas where an inspector desires to travel that are not addressed in this document. It is the employee's responsibility to note these areas and consult with CFIA supervisors and management to address them.

2. Introduction

In 1990, a pilot project was undertaken to develop a fall protection and rescue program for ship inspectors in western Canada. From this pilot project, a fall protection and rescue program was established and has been in use since that time. This edition of the program reflects program, equipment, procedure and training changes that have occurred over the last several years.

An inspection requires the inspector to climb a variety of structures and into a ship's hold to visually inspect the vessel. Fall hazards are encountered while climbing on structure and around the holds of the vessel. It is the desire of the Canadian Food Inspection Agency to provide equipment, training and procedures to minimize and control the risk associated with fall hazards when conducting an inspection. This manual, combined with inspector training and equipment, is intended to provide guidance to inspectors on how to protect themselves from fall hazards.

Gravitec Systems, Inc., has worked with CFIA to develop these work procedures considering occupational health and safety regulations, CSA and ANSI standards, current technology of equipment, and industry best practices. CFIA believes the current methodology described in this program is the most effective means to protect inspectors from fall hazards. It is apparent that conventional fall protection methods are technically infeasible for the following reasons:

- permanent fall protection installations cannot be put into transient vessels
- engineered solutions cannot be employed on transient vessels
- vessels are only available for limited periods of time and inspectors are given access on a limited timeline
- traditional scaffolding and ladder solutions increase the duration of exposure of employees during assembly and dismantling of the systems

- traditional fall arrest systems (lanyards, lifelines, SRDs) cannot always be employed due to the variety of hold configurations and lack of acceptable anchorages

Ships' holds were never designed to accommodate fall protection systems. The variety of hold configurations and the need for inspectors to have mobility necessitated the decision to introduce and use a belay system. A belay system has considerable advantages over other fall arrest systems. The first is the ability to reduce arresting forces by keeping free fall distances to a minimum, even as the inspector moves. The second advantage is that if a fall does occur, the inspector can be immediately lowered to the ground or deck of the hold where aid can be rendered promptly. Other fall arrest systems would keep the inspector suspended, increasing the chances of harness-induced trauma and significantly increased response times for rescue. A belay system does not require a rescuer to climb to the suspended inspector and conduct a rescue; the suspended inspector is simply lowered to a safe location. Other benefits include mobility, ease of transport, one-person rescue ability, and increased safety due to reduced free fall distances and impact forces. Although requiring a higher level of skill and training, a belay system remains the most feasible system.

The belay system was demonstrated to CFIA and Labor Canada representatives in the fall of 1990 and it was recognized that this was the only reasonable answer. There have been little changes to the system since this time, but CFIA has undertaken improvements that include the use of mechanical belay devices, higher quality equipment, initial and refresher training, as well as the development of written procedures to ensure the protection of inspectors from fall hazards.

This program has been developed considering regulatory requirements of the Canada Labor Code, Canadian Standards Association and ANSI Z359 Fall Protection Code.

3. Training

CFIA has developed a four-part fall protection and rescue training program. All inspectors who will be exposed to fall hazards and/or belaying must participate in initial training and be participating in the On-the-Job training before working at heights and being assigned inspections.

The use of fall protection and rescue equipment is a skill that must be practiced. The operation of a belay line requires the operator to be diligent and in communication with the climber at all times. Although not difficult, a certain level of skill and proficiency must be maintained. This training structure has been developed to introduce inspectors to fall protection and rescue methods during initial training, provide opportunities to remain proficient during in-house training, and be tested and challenged during formal training.

It is important to note that this is not "certification" training. This is not a pass / fail training program. This training program is designed to introduce inspectors to the equipment and develop a foundation of skills and knowledge. After initial training, inspectors will work with experienced inspectors and begin to apply what they have learned from initial training under the supervision of more experienced staff. The in-house training is an opportunity to review specific skill sets that are not used frequently (i.e. rescue knots). During formal training, all skill sets will be reviewed by an independent trainer to challenge each inspector. Depending on the availability of a vessel, formal training may take place onboard or at an alternate facility. The intent of the formal training is to verify skill sets and discuss the program as a whole (new equipment, industry changes, issues, etc.).

3.1 Initial Training

Objective: to introduce new inspectors to fall protection equipment and belaying

Prerequisites: Employed by CFIA (Inspector)

Training Location: Gravitec Systems Training Facility

Length of Time: 16 hours

Content:

- Introduction to Fall Protection (CFIA Fall Protection Program)
- Hierarchy of Fall Protection
- Arresting Forces and Energy Dissipation Principles
- Anchorage Theory
- Connector Compatibility
- Application of Full Body Harnesses
- Application of Energy Absorbing Lanyard
- Introduction to Belaying
- Harness Donning & Suspension Exercise
- Climbing & Traverse Lanyard Exercise
- Work Positioning Exercise
- Anchoring Exercise
- Belaying Exercise
- Climbing Exercise w/ Belay System and Communication
- Rescue Knots

3.2 On-the-Job Training

Objective: to begin applying initial training on-board, witness an inspection and use the skills and equipment under the supervision of another inspector.

Prerequisites: Employed by CFIA (Inspector), completion of Initial Training (3.1).

Training Location: On-board Vessels

Length of Time: N/A

Content: See Appendix A, Sign-off Sheet for Grain Ship Inspector

3.3 In-House Training

Objective: to practice skills used during use of fall protection and rescue equipment

Prerequisites: Employed by CFIA (Inspector), completion of Initial Training (3.1) and in progress (or completion) of On-the-Job Training (3.2).

Training Location: CFIA office

Length of Time: N/A (short duration training sessions to keep skills current)

Content:

- Rescue Knots
- Installing and Operating Belay Device
- Belaying Communication
- Lowering using Belay Device
- Raising & Lowering Using Block & Tackle
- Rigging Haul System Using Block & Tackle
- Rigging Spec Pak with Block & Tackle
- Rigging Spec Pak into Haul System

3.4 Formal Training & Skills Verification

Objective: to simulate and review fall protection and rescue skills and equipment

Prerequisites: Employed by CFIA (Inspector)

Training Location: CFIA office / Vessel / Alternate Location

Length of Time: 16 hours

Content:

- Fall Protection Review (CFIA Fall Protection Program)
- Hierarchy of Fall Protection
- Harness Donning & Suspension Exercise
- Belaying Review and Skills Verification
- Climbing & Traverse Lanyard Exercise
- Work Positioning Exercise
- Rescue Knot Review
- SPEC Pak Review
- Assisted Rescue from Vertical Structure
- Belaying in Hold (Side Frames & Bulkheads)
- Rescue from Hold using Block & Tackle
- Rescue from Hold using Haul System
- Evacuation from Vessel (Gangway)

4. Fall Protection and Rescue Equipment

The fall protection equipment listed in this document is currently in use. Only equipment from this list shall be used to maintain consistency, quality and ease of training throughout the program. This equipment has been selected based upon quality, adherence to safety standards and familiarity of existing inspector staff. Variations from this list of equipment are allowed, but only with consent from the safety office.

Refer to the specific manufacturer instructions on how to inspect, assemble, use and disassemble each item.

4.1 Full Body Harness: any CSA approved full body harness with back, front and hip D-rings

4.2 Belay Line (Rope): NFPA 1983 11.5 mm Life Safety Rope with polyester mantle.

4.3 Belay Device: 540 Rescue Belay, Large or equivalent belay device with automatic locks.

4.4 Energy Absorbing Lanyard: any CSA approved lanyard with energy absorber.

4.5 Personal Equipment: any leather glove when belaying, other PPE as per the applicable JHA

4.6 Pulleys: any NFPA certified pulley compatible with 11.5mm rescue rope

4.7 Carabiners: DMM Scaffold, DMM C840 or ISC KH251 or equivalent.

4.8 Anchorage Connectors: Capital Safety Cable Choker 5900550 or equivalent

4.9 Ascenders: Petzl Microscender B54 or equivalent

4.10 Descenders: Petzl I'D D20 or equivalent

4.11 Rescue Subject Packaging: Yates 900 Spec Pac or equivalent

4.12 Block & Tackle: Capital Safety Rollgliss / Miller Series 70 / MSA Surety Man or equivalent

4.13 Helmet: Petzl Vertex Best A16 or equivalent

4.14 Abrasion Protection: any abrasion guard designed for use with life safety rope

4.15 Anchor Plate: Petzl Paw S P63S or equivalent

4.16 Work Positioning Lanyard: Petzl L52-2 or equivalent

4.17 Tagline Rope: NFPA 1983 or CE 7 – 9.5 mm nylon or polyester accessory cord.

4.18 Rope Lanyard: Petzl Jane L50 – (Length) or equivalent

5. Fall Protection Procedures

The following procedures are general procedures that can be applied to the majority of areas where an inspector must access. Every ship is unique and each inspector must exercise judgment during an inspection according to site conditions. Do not enter into a situation where your co-worker cannot conduct a rescue or climb on structure that is suspicious. Climbing is not mandatory and alternate methods of inspection can be employed when these situations arise.

5.1 Climbing and Traversing with an Energy Absorbing Lanyard

Description: This is a general procedure that describes how to use an energy-absorbing lanyard while climbing around ship structure. The small snaphook (center) on the lanyard attaches to the dorsal (back) D-ring of the harness. By alternating connections of the lanyard legs, an inspector can move vertically and horizontally and remain connected. Only one leg of the lanyard needs to be attached to an acceptable anchorage. It is important to select quality anchorages. It is the inspector's responsibility to select anchorages that are structurally sound, in the correct location and compatible with the lanyard.

WARNING: Inspect the structure before climbing. Do not climb/work on any structure that has obvious signs of damage, isn't structurally sound, is suspicious, causes concern or is located in or around a dangerous environment (impalement hazards, electrical, etc.). Alternate methods of inspection and access can be required of the vessel when these situations arise.

Equipment: Full Body Harness, Helmet, and Energy Absorbing Lanyard

Clearance Requirement: This lanyard requires 3.7 m (12') plus the inspector's height of clearance from the anchorage.

Rescue Method: If an inspector is suspended from the lanyard, the first rescue option is for the inspector to regain their footing and climb to safety. If incapacitated, activate the emergency response procedure and conduct a Block & tackle or Re-Directed Hauling System rescue.

1. At a safe location, untangle the harness and lanyard, spreading them out in a clean, dry area where inspection can be performed.
2. Inspect the equipment in accordance with manufacturer instructions for function and condition.
3. After properly donning a full body harness (see training manual), attach the small snaphook, nearest to the shock absorber, to the dorsal D-ring of the full body harness.
4. Visual or tactile confirmation should be made to ensure the snaphook is connected to the D-ring securely.
5. Don the helmet and connect chinstrap.
6. Connect one of the two large snaphooks (on the end legs of the "Y") to an approved fall arrest anchorage.

WARNING: One leg of the lanyard must always be connected.

7. The unused leg of the lanyard should be stored on the harness break-away clip on the harness.
8. To climb:
 - 8.1 Move up the structure until the first connected snaphook is at shoulder height.
 - 8.2 Connect the other large snaphook to an acceptable anchorage overhead.
 - 8.3 Reach back and detach the first snaphook.
 - 8.4 Continue alternating the snaphooks, connecting them only to acceptable anchorage points and ensuring that you always have at least one snaphook connected to an anchorage at all times.
 - 8.5 Reverse the procedure to move downward.
9. To Traverse:
 - 9.1 Move along the structure until the first connected snaphook is nearly out of reach.
 - 9.2 Connect the other large snaphook to an acceptable anchorage towards the path of travel.
 - 9.3 Reach back and detach the first snaphook.
 - 9.4 Continue alternating the snaphooks, connecting them only to acceptable anchorage points and ensuring that you always have at least one snaphook connected to an anchorage at all times.
 - 9.5 Reverse the procedure to move downward.
10. Be mindful that the lanyard needs to be anchored approximately 5.5 m (18') above grade or the closest potential hazard. It is required that the lanyard be used at any height greater than 2.4 m (8'). It is still beneficial and required to use the lanyard any height greater than 2.4 m, since the lanyard may not fully deploy and may minimize injury potential by keeping an inspector's torso and head from striking lower structure.
11. Be mindful of swing fall hazards, particularly when traversing. Swing fall is inevitable since overhead anchorages are not available in all instances. Do not anchor the lanyard in such a manner that would cause a swing fall into impalement hazards, electrical hazards, moving equipment or other dangerous structure.

5.2 Belaying into Hold

Description: This is a general procedure that describes how to belay an inspector down the ladder into the hold (See Figure A). The belay system is anchored above the access point and the belay rope is connected to the dorsal D-ring of the inspector's harness. The belayer operates the belay device, paying out rope as the inspector climbs downward. The belayer, by maintaining a taut line, minimizes fall distance and arresting forces. The belayer has control over the speed at which the inspector climbs down. The belayer cannot see the inspector, so cooperation and communication are important. The belayer has the responsibility to pay out rope at a safe pace and keep the fall distance at a minimum. The climbing inspector has the responsibility to communicate their intentions and desires to the belayer, not over climb the belay system, and not sabotage the belayer.

The type of ladders that go into the hold will vary. The use of a belay line is not required on spiral ladders or stairs, providing they are completely equipped with guardrails. It is acceptable and encouraged, however, to use the belay line on any method of access that has been modified, has unprotected sections or has two or three different access methods.

WARNING: Inspect the structure before climbing. Do not climb/work on any structure that has obvious signs of damage, isn't structurally sound, is suspicious, causes concern or is located in or around a dangerous environment (impalement hazards, electrical, etc.). Alternate methods of

inspection and access can be required of the vessel when these situations arise. Ladders and stairs are often damaged, bent, or have been modified from their original design. If an access point is unacceptable, do not use that access point and more time may be required to walk the length of the hold and enter / exit through the second location.

Equipment: Full Body Harness, Helmet, Anchorage Connector, Carabiners, Belay Device, Belay Line, and Abrasion Protector

Clearance Requirement: Clearance on the belay system will be minimal when operated correctly. The amount of slack and stretch in the lifeline will vary depending on the belayer and the amount of rope being loaded. It is important to keep the belay line as taut as possible without hindering the climbing inspector.

Rescue Method: If an inspector is suspended from the belay system, the first rescue option is for the inspector to regain their footing and climb to safety. If incapacitated, the belayer will lower the inspector to a safe location and activate the emergency response procedure. The Block & Tackle or Re-Directed Hauling System rescue methods can be employed.

1. Upon reaching the hold and before opening any hatches or access ports, assess the area and determine:

- 1.1 Method of entering & exiting the hold
- 1.2 Staging area for equipment and belay system
- 1.3 Communications with belayer
- 1.4 Rescue method should a fall occur
- 1.5 Deck traffic that can interfere with belay system
- 1.6 Anchorage locations

2. Develop belay plan with co-worker and determine belayer and inspector (climber) roles.

3. Inspect anchorage connector, carabiners, harness, belay device, abrasion protector and belay rope (plus any additional equipment) in accordance with manufacturer instructions for function and condition.

4. The Belayer will:

- 4.1 Select an acceptable anchorage near the entrance of the hold and install the anchorage connector according to manufacturer instructions.
- 4.2 Using a carabiner, connect the belay device to the anchorage connector.
- 4.3 Install the belay line into the belay device and adjust the belay line to length to the entrance of the hold.
- 4.5 Direct the belay line as necessary above and as close to the hold entrance as possible. An additional anchorage connector and carabiner may be required to align the belay line over the entrance (See Figure A).
- 4.6 Inspect the path of the belay line and place abrasion padding over any sharp or abrasive areas that may contact the belay line.
- 4.7 Double-check the anchorage, connection of the belay device and length of the belay line in preparation to belay.

5. The Climber will:

- 5.1 Inspect and don the full body harness according to manufacturer instructions.
- 5.2 Attach the belay line to the dorsal D-ring of the full body harness.
- 5.3 Ask for a buddy check of the full body harness and belay connection.
- 5.4 Conduct a radio check with the belayer.

6. After the buddy and radio check is complete, the belayer will take their position at the belay device. (Refer to training manual for hand sequence and belay communication).
7. The climber will begin the belay sequence by communicating with the belayer that he/she is ready to climb (refer to training manual for hand sequence and belay communication) by asking “On Belay?”
8. The belayer will double-check the anchorage, belay device, and tension of the belay line before replying “Belay On.”
9. The climber will open the access hatch and reply to the belayer “Climbing,” but will not move until the belayer responds.
10. The belayer will reply “Climb On” and adjust the belay line as needed as the inspector climbs down.
11. The belayer will be very attentive as to the speed of the climber to keep as short a line as possible without hindering the movements of the climber. Slack is undesirable as it will increase the fall distance and arresting force. Due to the nature of accessing cargo holds, visual contact may not always be possible. Verbal commands and radio communication will be critical between the belayer and climber for belay line management.
12. The climber will continue down into the hold. Once the climber has reached the deck and is no longer exposed to a fall hazard, the climber will use the command “Off Belay.”
13. The belayer will respond with “Belay Off.” This command notifies the climber that the belayer is no longer tending the belay line and it can be disconnected.
14. The belayer will take up the belay line, disconnect the anchorages and relocate the belay system for the next procedure.

NOTE: Refer to Side-frame / Bulkhead inspection if required. The remaining steps in this procedure will be used when the inspector has completed the inspection and is ready to exit the hold.

15. Once the climber intends to return topside, the climber will:
 - 15.1 Verify harness is donned in accordance with the manufactures instructions.
 - 15.2 Check the path of the belay line and ensure it's clear of potential entanglement.
 - 15.3 Connect belay line to Dorsal D-ring
 - 15.4 Conduct a buddy check, verify harness and belay line connection.
 - 15.5 Establish communication with belayer to relay intentions to return topside by using the command “On Belay.”
16. The belayer will:
 - 16.1 Check the anchorage, connector, belay device and belay rope for proper use in accordance with the manufacturer's instructions.
 - 16.2 Verify the path of the belay rope is free of potential entanglement.
 - 16.3 Once system has been checked, respond to climber with command “Belay On.”
17. Climber will approach ladder and relay to belayer to take out any slack there is in the belay line.
18. Climber will pass command “Climbing” to belayer, but not begin climbing until belayer responds.
19. The belayer will respond “Climb On” and adjust the belay line as needed as the inspector climbs up.
20. Once the climber has cleared the access hatch and secured the hatch to eliminate the hazard, the climber will use the command “Off Belay” to the belayer.
21. The belayer will respond with “Belay Off,” relaying that the belay line is now unattended and the climber can disconnect from the system.

5.3 Side Frame Inspection

***Note:** This procedure is also used for bulkhead and pipe-guards. This procedure can be applied to most any structure where belaying is applicable.

Description: This is a general procedure that describes how to belay an inspector along a typical side frame. The belay system is anchored topside and runs into hold to the climbing inspector (climber). The belay rope is connected to the dorsal D-ring of the inspector's harness. The belayer operates the belay device, belaying the rope as the inspector moves. The belayer, by maintaining a taut line, minimizes fall distance and arresting forces. The belayer has control over the speed at which the inspector moves. The belayer cannot see the inspector, so cooperation and communication are important. The belayer has the responsibility to adjust rope at a safe pace and keep the fall distance at a minimum. The climbing inspector has the responsibility to communicate their intentions and desires to the belayer, not over climb the belay system, and not sabotage the belayer.

Side frame configurations vary. This procedure is required anytime the inspector is climbing greater than 2.4 m (See Figure B). The belay line is not necessary for inspections if the vertical distance from the tank top to your feet is less than 2.4 m, and the inspector is not climbing any higher.

WARNING: Inspect the structure before climbing. Do not climb/work on any structure that has obvious signs of damage, isn't structurally sound, is suspicious, causes concern or is located in or around a dangerous environment (impalement hazards, electrical, etc.). Alternate methods of inspection and access can be required of the vessel when these situations arise.

Equipment: Full Body Harness, Helmet, Anchorage Connector, Carabiners, Belay Device, Belay Line, Work Positioning Lanyard, and Abrasion Protector

Clearance Requirement: Clearance on the belay system will be minimal when operated correctly. The amount of slack and stretch in the lifeline will vary depending on the belayer and the amount of rope being loaded. It is important to keep the belay line as taut as possible without hindering the climbing inspector.

Rescue Method: If an inspector is suspended from the belay system, the first rescue option is for the inspector to regain their footing and climb to safety. If incapacitated, the belayer will lower the inspector to a safe location and activate the emergency response procedure. The Block & Tackle or Re-Directed Hauling System rescue methods can be employed.

1. Upon reaching the hold and before climbing, assess the area and determine:
 - 1.1 That the hold hatches have been blocked and locked so they cannot close during inspection
 - 1.2 Staging area for equipment and belay system
 - 1.3 Communication method with belayer
 - 1.4 Rescue method should a fall occur
 - 1.5 Deck traffic that can interfere with belay system
 - 1.6 Anchorage locations
2. Develop belay plan with co-worker and determine belayer and inspector (climber) roles.

3. Inspect anchorage connector, carabiners, harness, belay device, abrasion protector and belay rope (plus any additional equipment) in accordance with manufacturer instructions for function and condition.

4. The Belayer will:

4.1 Select an acceptable anchorage above the belayer and install the anchorage connector according to manufacturer instructions.

4.2 Using a carabiner, connect the belay device to the anchorage connector.

4.3 Install the belay line into the belay device and adjust the belay line to length according to the climber in the hold.

4.5 Place the belay line along the climber's path of travel. Allow for the maximum amount of travel before swing fall is unacceptable. (See Figure B)

4.6 Inspect the path of the belay line and place chaff padding over any sharp or abrasive areas that may contact the belay line.

4.7 Double-check the anchorage, connection of the belay device and length of the belay line in preparation to belay.

5. The Climber will:

5.1 Inspect and don the full body harness according to manufacturer instructions.

5.2 Attach the belay line to the dorsal D-ring of the full body harness.

5.3 Ask for a buddy check of the full body harness and belay connection.

5.4 Conduct a radio check with the belayer.

6. After the buddy and radio check is complete, the belayer will take their position at the belay device. (Refer to training manual for hand sequence and belay communication).

7. The climber will begin the belay sequence by communicating with the belayer that he/she is ready to climb (refer to training manual for hand sequence and belay communication) by asking "On Belay?"

8. The belayer will double-check anchorage, belay device, and tension of the belay line before replying "Belay On."

9. The climber will reply to the belayer "Climbing," but will not move until the belayer responds.

10. The belayer will reply "Climb On" and adjust the belay line as needed as the inspector climbs up or moves along the side frame slope.

11. The belayer will be very attentive as to the speed of the climber to keep as short a line as possible without hindering the movements of the climber. Slack is undesirable, as it will increase the fall distance and arresting force. Due to the nature of accessing cargo holds, visual contact may not always be possible. Verbal commands and radio communication will be critical between the belayer and climber for belay line management.

12. The climber will begin traversing the side frame, conducting the inspection and communicating movements with the belayer.

13. Once the climber has traversed to such a point where swing fall is an issue, the climber must stop and allow the belayer to re-anchor the system.

14. The climber must remain protected while the belay system is moved. Protection for the climber will be achieved by:

14.1 The climber attaching a work positioning lanyard into the support structure before the belayer disconnects the belay line; or

14.2 Being belayed down the slope to the floor of the hold and moving back up the slope once the belay system is re-anchored; or

14.3. Transferring to a second belay line (See High Angled Hopper Tank Procedure).

15. Once the belay line is re-anchored, the belayer and climber can continue the inspection from step #7.

16. Upon completion of the inspection, the climber will be belayed down the slope to the floor of the hold.
17. Once the climber is safely on the floor, the climber will use the command “Off Belay” to the belayer.
18. The belayer will respond with “Belay is Off,” relaying that the belay line is now unattended and the climber can disconnect from the system.

5.4 High Angled Hopper Tank Inspection

***Note:** This procedure can also be used for side-frame inspections allowing the inspector to remain connected during the belay anchor transfer and prevent them from climbing up and down the slope.

Description: This is a general procedure that describes how to belay an inspector from the floor of the hold, up the slope of a high angled hopper tank. The belay system is anchored directly above and in the middle of the slope. The belay device is set in the middle of the belay rope and both ends are connected to the climbing inspector (See Figure B2, the red and blue lines represent one rope). The belay rope has two re-direct anchors. As the inspector climbs up the slope, the swing fall on the first line will eventually become too great. At this point the inspection is stopped, the load line is tied off, and the opposing end of the belay line becomes active. The belayer “transfers” the climber from one end of the belay rope to the other. The belayer, by maintaining a taut line, minimizes fall distance and arresting forces. The belayer has control over the speed at which the inspector climbs. The belayer cannot see the inspector, so cooperation and communication are important. The belayer has the responsibility to pay out rope at a safe pace and keep the fall distance at a minimum. The climbing inspector has the responsibility to communicate their intentions and desires to the belayer, not over climb the belay system, and not sabotage the belayer.

WARNING: Inspect the structure before climbing. Do not climb/work on any structure that has obvious signs of damage, isn’t structurally sound, is suspicious, causes concern or is located in or around a dangerous environment (impalement hazards, electrical, etc.). Alternate methods of inspection and access can be required of the vessel when these situations arise. Ladders and stairs are often damaged, bent, or have been modified from their original design. If an access point is unacceptable, do not use that access point and more time may be required to walk the length of the hold and enter / exit through the second location.

Equipment: Full Body Harness, Helmet, Anchorage Connectors, Carabiners, Belay Device, Belay Line, Work Positioning Lanyard, Abrasion Protectors, Anchor Plate, Rope Lanyard and Ascender

Clearance Requirement: Clearance on the belay system will be minimal when operated correctly. The amount of slack and stretch in the lifeline will vary depending on the belayer and the amount of rope being loaded. It is important to keep the belay line as taut as possible without hindering the climbing inspector.

Rescue Method: If an inspector is suspended from the belay system, the first rescue option is for the inspector to regain their footing and climb to safety. If incapacitated, the belayer will lower the inspector to a safe location and activate the emergency response procedure. The Block & Tackle or Re-Directed Hauling System rescue methods can be employed.

1. Upon reaching the hold and before climbing, assess the area and determine:

- 1.1 That the hold hatches have been blocked and locked so they cannot close during inspection
- 1.2 Staging area for equipment and belay system
- 1.3 Communication method with belayer
- 1.4 Rescue method should a fall occur
- 1.5 Deck traffic that can interfere with belay system
- 1.6 Anchorage locations
2. Develop belay plan with co-worker and determine belayer and inspector (climber) roles.
3. Inspect anchorage connector, carabiners, harness, belay device, abrasion protector and belay rope (plus any additional equipment) in accordance with manufacturer instructions for function and condition.
4. The Belayer will:
 - 4.1 Select an acceptable anchorage on the deck, mid-point of the angled slope, above the belayer and install the anchorage connector according to manufacturer instructions.
 - 4.2 Using a carabiner, connect the belay device to the anchorage connector.
 - 4.3 Install the belay line into the belay device and adjust one end of the belay line to length according to the climber in the hold.
 - 4.4 Select an acceptable anchorage on the deck and edge of the hold, approximately 1/3 of the way up the slope, and install the anchorage connector according to manufacturer instructions.
 - 4.5 Connect the belay rope (this section of the belay rope will be referred to as the first-half) to the anchorage connector using a carabiner, redirecting the belay line to the climber (See Figure B2).
 - 4.6 Pad any points of contact where the rope will be damaged by structure.
 - 4.7 Select an acceptable anchorage on the deck, approximately 2/3 of the way up the slope, and install the anchorage connector according to manufacturer instructions.
 - 4.8 Lower the opposite end of the belay rope (this section of the belay rope will be referred to as the second-half) into the hold for attachment to the climber.
 - 4.9 Connect the belay rope to the anchorage connector using a carabiner.
 - 4.10 Pad any points of contact where the rope will be damaged by structure.
 - 4.11 Connect both ends of the belay line to the climbers' dorsal d-ring. (Oppose the gates of the carabiners to reduce the possibility of connector conflicts. Verify that both carabiners are connected into the dorsal d-ring and not each other)
 - 4.12 Inspect the path of the belay line and place chaff padding over any sharp or abrasive areas that may contact the belay line.
 - 4.7 Double-check the anchorages, connection of the belay device and length of the belay line in preparation to belay.
5. The Climber will:
 - 5.1 Inspect and don the full body harness according to manufacturer instructions.
 - 5.2 Attach the belay lines to the dorsal D-ring of the full body harness.
 - 5.3 Ask for a buddy check of the full body harness and belay connection.
 - 5.4 Conduct a radio check with the belayer.
6. After the buddy and radio check is complete, the belayer will take their position at the belay device. (Refer to training manual for hand sequence and belay communication).
7. The climber will begin the belay sequence by communicating with the belayer that he/she is ready to climb (refer to training manual for hand sequence and belay communication) by asking "On Belay?"
8. The belayer will double-check anchorage, belay device, and tension of the belay line before replying "Belay On."

9. The climber will reply to the belayer “Climbing,” but will not move until the belayer responds.
10. The belayer will reply “Climb On” and adjust the belay line as needed as the inspector climbs up or moves along the slope.
11. The belayer will be very attentive as to the speed of the climber to keep as short a line as possible without hindering the movements of the climber. Slack is undesirable, as it will increase the fall distance and arresting force. Due to the nature of accessing cargo holds, visual contact may not always be possible. Verbal commands and radio communication will be critical between the belayer and climber for belay line management.
12. The climber will begin traversing the high angle hopper tank, conducting the inspection and communicating movements with the belayer.
13. Once the climber has traversed to such a point where swing fall is an issue, the climber must stop and allow the belayer to change direction of the belay system.
14. The climber must remain protected while the belay system direction is changed.
 - 14.1 The belayer will bring the first-half of the belay line taught and lock-off the belay device.
 - 14.2 Attached the ascender to the first half of the belay line and anchor it to the structure using the rope lanyard and ascender.
 - 14.3 Once the belay line is secure in the ascender, the belay device can be unlocked and slack taken out of the second-half of the belay line.
 - 14.4 Once the second-half of the belay line is taught, lock off the belay device.
 - 14.5 Confirm that the belay device is locked and remove the ascender.
15. Once the belay line is re-anchored, the belayer and climber can continue the inspection from step #7.
16. Reverse the procedure as the climber comes down the slope.
17. Once the climber is safely on the floor, the climber will use the command “Off Belay” to the belayer.
18. The belayer will respond with “Belay is off,” relaying that the belay line is now unattended and the climber can disconnect from the system.

6. Rescue Procedures

The following procedures are general rescue procedures that can be applied to the majority of areas where an inspector must access. Every ship and rescue is unique, and judgment must be exercised during a rescue event according to the condition of the rescue subject, time, equipment available, and the physical surroundings. Do not enter into a situation where you cannot ensure your own safety.

Rescue equipment described in this procedure must be stored nearby and accessible. For inspections conducted at berth, the rescue equipment can be stored dockside inside the inspector vehicle. For inspections conducted at anchor:

Vancouver Office Inspections: the equipment must be stored onboard or onboard the water taxi.

Prince Rupert Office Inspections, Inner Harbor: the equipment may remain at the water taxi service provider dock, provided the equipment is readily available and deliverable to the vessel on short notice.

Prince Rupert Office Inspections, Outer Anchorages: the equipment must be onboard or onboard the water taxi.

Keep in mind that ship inspectors are not professionally trained to diagnose, treat, package, or rescue an injured person on their own. Contacting emergency response professionals is a priority. Do not risk yourself or the rescue subject by acting hastily. The inspector's priority is to get the rescue subject to a safe location (if possible), call emergency professionals, and render first aid as necessary.

WARNING: Inspect the structure before climbing. Do not climb/work on any structure that has obvious signs of damage, isn't structurally sound, is suspicious, causes concern or is located in or around a dangerous environment (impalement hazards, electrical, etc.). Alternate methods of rescue can be utilized if the situation is beyond the scope of what the rescuer is able to do or is prepared for. Surrounding structure is often damaged, bent, or has been modified from the original design. If the situation is too dangerous, or the cause of the accident is beyond the scope of this rescue procedure (structural collapse, crane failure, falling debris, fire, explosion, etc.), do not conduct the rescue, remove yourself from danger and contact emergency response professionals.

Depending on the situation, inform the rescue professionals that you have specialized equipment that can be used to extract the rescue subject from the area. Be prepared to set up, operate, and direct others how to use the equipment.

6.1 Lowering on Belay

This procedure assumes the climbing inspector has fallen into the belay line at some point and time during the belay sequence.

1. Take a deep breath and don't panic.
2. Hold the brake line and try to establish communication with the climber.
3. If possible, hold steady while the climber regains footing on the structure and climbs under belay, down the structure to a safe area.
4. If the climber is unresponsive, tie-off the belay line and attempt to get visual contact of the climber.

WARNING: Do not expose yourself to unprotected fall hazards while conducting the rescue. Do not climb on top of the hold hatch area to look at the climber or climb into the hold without fall protection. Do not add to the situation with unnecessary risk or becoming a second rescue subject.

6. If safe to do so, using the belay device, lower the climber to the ground slowly and under control.
5. Activate emergency response and informing them of your location and situation by calling:
 - 911 in Prince Rupert
 - 911 when alongside in Vancouver
 - *16 in Vancouver with a cell phone
 - Ch. 16 (156.8 MHz) on VHF radio
7. Approach the climber and conduct an initial first aid assessment.
8. Render aid as needed.

6.2 Assisted Rescue Using Block & Tackle (See Figure C)

Description: This procedure can be used for several different rescue scenarios. The block and tackle is an assembly of pulleys and ropes that can be used in any situation where the rescue subject must be lifted or lowered in the vertical plane. The main advantage to the block and tackle is it is very

simple to use and is very forgiving. The system can change from up to down without re-rigging and the system can be operated safely with minimal training. The block and tackle can be attached directly to the front D-ring on the rescue subject's harness or to the lifting rings on the Spec Pac. The block and tackle can also be used to disconnect an inspector that is suspended from a lanyard. The block and tackle can only be used for vertical lifting and lowering. The block and tackle is unable to navigate corners, as it is suited for vertical environments only. Use the Re-directed Hauling System for any rescue scenario where the rescue rope must navigate corners.

Equipment:

Lifting System: Anchorage Connector, Carabiners, Block and Tackle, Harness or Spec Pac, Tagline.

Belay System: Anchorage Connectors, Carabiners, Belay Device, Belay Rope, Abrasion Protection

Lifting System Assembly

1. Upon determining that the area is safe and a rescue can be conducted, assemble the equipment and rescue personnel to develop a basic plan.

WARNING: Do not expose yourself to unprotected fall hazards while conducting the rescue. Do not add to the situation with unnecessary risk or becoming a second rescue subject. Do not stand near unprotected edges, climb ladders without fall protection, or be near open holes and hatches without being protected.

2. Select an acceptable anchorage above the lifting area.
3. Using an anchorage connector and carabiner, attach the head of the block and tackle to the anchorage.
4. Ensure that the anchorage is high enough, allowing space for the rescue subject to come out of the hold or opening area.
5. Lower the end of the block and tackle to the rescue subject.
6. Connect the block and tackle lifting pulley to:
 - 6.1 the front D-ring of the rescue subject's harness;
 - 6.2 the Spec Pac vertical lifting ring;
 - 6.3 the Spec Pac lifting bridle.
7. Visually inspect the block and tackle ropes path of travel and guard against any abrasion of contact issues.
8. Prepare to lift the rescue subject with the haul line of the block and tackle (it may include a rope ascender that attaches to the haul line and your harness).
9. Attach taglines as needed to the rescue subject in preparation to lift.
10. Await instruction to lift by the rescue leader.

Belay System Assembly

1. Upon determining that the area is safe and a rescue can be conducted, assemble the equipment and rescue personnel to develop a basic plan.

WARNING: Do not expose yourself to unprotected fall hazards while conducting the rescue. Do not add to the situation with unnecessary risk or becoming a second rescue subject. Do not stand near unprotected edges, climb ladders without fall protection, or be near open holes and hatches without being protected.

2. Select an acceptable anchorage in the general area for the belay anchor.
3. Inspect anchorage connector, carabiners, harness, belay device, abrasion protector and belay rope (plus any additional equipment) in accordance with manufacturer instructions for function and condition.
4. Select an acceptable anchorage above the lifting area to re-direct the belay line from the belay anchor to the rescue subject.
5. Select an anchorage independent from the rescue system anchorage connector, but as close as possible to reduce swing fall or contact with structure should the belay line be needed.
6. Install the anchorage connector according to manufacturer instructions.
7. Using a carabiner, thread the belay rope through the re-direct anchor and to the belay anchor.
8. Install the belay line into the belay device and adjust the belay line to length.
9. Attach the belay line to:
 - 7.1 the back d-ring of the rescue subjects harness;
 - 7.2 the Spec Pac vertical lifting ring;
 - 7.3 the Spec Pac lifting bridle.
10. Inspect the path of the belay line and place abrasion padding over any sharp or abrasive areas that may contact the belay line.
11. Double-check the anchorage, connection of the belay device and length of the belay line in preparation to belay.
12. Await instruction to belay by the rescue leader.

Rescue Lift

1. After the lifting and belay system have been assembled, confirm all connections to the belay anchorage, belay re-direct, block and tackle anchorage, lifting connection to rescue subject and belay connection to rescue subject.
2. The leader will communicate to rescuers to prepare to lift.
3. The rescuers on the lifting and belay system will double-check their connections and the rope's path of travel, and remove slack in the systems.
4. The rescue leader will begin the belay sequence by communicating with the belayer that he/she is ready to lift (refer to training manual for hand sequence and belay communication) by asking "On Belay?"
8. The belayer will double-check anchorage, belay device, and tension of the belay line before replying "Belay On."
9. The rescue leader will begin the lifting sequence by communicating with the hauler "Prepare to Lift."
10. The hauler will reply "Ready to Lift."
11. The rescue leader will give the command to "Lift," engaging the haul system and belay system with one command.
12. The hauler will lift the rescue subject and the belayer will follow the lift by keeping a minimal amount of slack in the system.
13. The rescue leader will monitor the lift and use the following commands:
 - STOP – all systems stop.
 - Up on Pulley – block and tackle goes up, belay holds still.
 - Up on Belay – belay goes up, block and tackle holds still.
 - Down on Pulley – block and tackle goes down, belay holds still.
 - Down on Belay – belay goes down, block and tackle holds still.
 - All Up – both systems up.
 - All Down – both systems down.

14. Additional rescuers will manipulate the tagline according to need, keeping the rescue subject away from structure.
15. Once the rescue subject has reached a safe area, the rescue leader will give the “STOP” command and the rescue subject can be transferred to the care of medical services.

6.3 Re-directed Hauling System (See Figure D)

Description: This procedure can be used for several different rescue scenarios. The Re-directed Hauling System is an assembly of pulleys and ropes that can be used in any situation where the rescue subject must be lifted or lowered. The main advantage to this system is the rope can be re-directed around corners and openings. The system requires more rigging than the block and tackle, but is more versatile. The rescue rope can be attached directly to the front D-ring on the rescue subject’s harness or to the lifting rings on the Spec Pac. The block and tackle is used to lift the rescue rope.

Equipment:

Lifting System: Anchorage Connectors, Carabiners, I’D, Rescue Rope, Pulley(s), Ascender (Rope Grab), Abrasion Protection, Block and Tackle, Harness or Spec Pac

Belay System: Anchorage Connectors, Carabiners, Belay Device, Belay Rope, Abrasion Protection

Lifting System Assembly

1. Upon determining that the area is safe and a rescue can be conducted, assemble the equipment and rescue personnel to develop a basic plan.

WARNING: Do not expose yourself to unprotected fall hazards while conducting the rescue. Do not add to the situation with unnecessary risk or becoming a second rescue subject. Do not stand near unprotected edges, climb ladders without fall protection, or be near open holes and hatches without being protected.

2. Select an acceptable anchorage above the lifting area.
3. Using an anchorage connector and carabiner, attach the pulley to the anchorage.
4. Ensure that the anchorage is high enough, allowing space for the rescue subject to come out of the hold or opening area.
5. In the general area, select an anchorage for the I’D. Ensure that there is enough space to allow the block and tackle to haul the rescue rope.
6. Connect the I’D to the anchorage connector using a carabiner.
7. Thread the rescue rope through the I’D and pulley above the lifting area.
8. Lower the end of the rescue rope to the rescue subject.
9. Connect the rescue rope to:
 - 6.1 the front D-ring of the rescue subjects harness;
 - 6.2 the Spec Pac vertical lifting ring;
 - 6.3 the Spec Pac lifting bridle.
10. Attach the rope ascender to the rescue rope on the brake hand side of the I’D.
11. Using an anchorage connector and carabiner, attach the head of the block and tackle in-line with the pulling direction of the rescue rope, far enough away to effectively lift the rescue subject.
12. Attach the lifting pulley on the block and tackle to the rope ascender on the rescue rope.
13. Visually inspect the rescue rope and block and tackle’s path of travel and guard against any abrasion or contact issues.

14. Prepare to lift the rescue subject by pulling on the block and tackle (the block and tackle provides enough advantage so one worker can lift several hundred pounds).
15. Attach taglines as needed to the rescue subject in preparation to lift.
16. Await instruction to lift by the rescue leader.

Belay System Assembly

1. Upon determining that the area is safe and a rescue can be conducted, assemble the equipment and rescue personnel to develop a basic plan.

WARNING: Do not expose yourself to unprotected fall hazards while conducting the rescue. Do not add to the situation with unnecessary risk or becoming a second rescue subject. Do not stand near unprotected edges, climb ladders without fall protection, or be near open holes and hatches without being protected.

2. Select an acceptable anchorage in the general area for the belay anchor.
3. Inspect anchorage connector, carabiners, harness, belay device, abrasion protector and belay rope (plus any additional equipment) in accordance with manufacturer instructions for function and condition.
4. Select an acceptable anchorage above the lifting area to re-direct the belay line from the belay anchor to the rescue subject.
5. Select an anchorage independent from the rescue system anchorage connector, but as close as possible to reduce swing fall or contact with structure should the belay line be needed.
6. Install the anchorage connector according to manufacturer instructions.
7. Using a carabiner, thread the belay rope through the re-direct anchor and to the belay anchor.
8. Install the belay line into the belay device and adjust the belay line to length.
9. Attach the belay line to:
 - 7.1 the back d-ring of the rescue subjects harness;
 - 7.2 the Spec Pac vertical lifting ring;
 - 7.3 the Spec Pac lifting bridle.
10. Inspect the path of the belay line and place abrasion padding over any sharp or abrasive areas that may contact the belay line.
11. Double-check the anchorage, connection of the belay device and length of the belay line in preparation to belay.
12. Await instruction to belay by the rescue leader.

Rescue Lift

1. After the lifting and belay system have been assembled, confirm all connections to the belay anchorage, belay re-direct, lifting anchorage, lifting re-direct anchorage, lifting connection to rescue subject and belay connection to rescue subject.
2. The leader will communicate to rescuers to prepare to lift.
3. The rescuers on the lifting and belay system will double-check their connections and the rope's path of travel, and remove slack in the systems.
4. The rescue leader will begin the belay sequence by communicating with the belayer that he/she is ready to lift (refer to training manual for hand sequence and belay communication) by asking "On Belay?"
8. The belayer will double-check anchorage, belay device, and tension of the belay line before replying "Belay On."

9. The rescue leader will begin the lifting sequence by communicating with the hauler “Prepare to Lift.”
10. The hauler will reply “Ready to Lift.”
11. The rescue leader will give the command to “Lift,” engaging the haul system and belay system with one command.
12. The hauler(s) will lift the rescue subject by pulling the haul line of the block and tackle, pulling the rescue rope through the pulley and tailing the slack rope through the I’D.
13. The belayer will follow the lift by keeping a minimal amount of slack in the system.
14. The rescue leader will monitor the lift and use the following commands:
 - STOP – all systems stop.
 - Up on Pulley – block and tackle goes up, belay holds still.
 - Up on Belay – belay goes up, block and tackle holds still.
 - Down on Pulley – block and tackle goes down, belay holds still.
 - Down on Belay – belay goes down, block and tackle holds still.
 - All Up – both systems up.
 - All Down – both systems down.
15. The block and tackle will need to be re-loaded as the ascender reaches the end of its travel distance.
16. To re-load the block and tackle, the rescue leader will call “STOP.”
17. The rescue leader will call “Re-Load.”
18. The hauler(s) will pull remaining slack through the I’D, holding the rescue rope in its current position, so the ascender and block and tackle can be re-loaded for another lift.
19. A rescuer will pull the ascender towards the re-direct pulley.
20. Once the block and tackle is re-loaded, the rescue leader will engage the next lift by calling “Lift.”
21. The hauler will lift the rescue subject by pulling the haul line of the block and tackle, pulling the rescue rope through the pulley and tailing slack rope through the I’D.
22. The belayer will follow the lift by keeping a minimal amount of slack in the system.
23. This lifting sequence will be repeated until the rescue subject is lifted to a safe area.
24. Additional rescuers will manipulate the tagline according to need, keeping the rescue subject away from structure.
25. Once the rescue subject has reached a safe area, the rescue leader will give the “STOP” command and the rescue subject can be transferred to the care of medical services.

6.4 Removal from Vessel

Description: This section provides options to remove the rescue subject from the vessel. Depending on the location of the vessel, available people and condition of the rescue subject, a number of different methods can be used to remove the rescue subject from the vessel. Rescuers must evaluate all available resources and select the safest, most expeditious method of removal according to situation.

Equipment: Same equipment used for 6.1, 6.2 and 6.3 procedures.

Assisted Carry’s: If the rescue subject is able, rescuers can assist them down the gangplank using a one or two person human crutch carry method. If the rescue subject is unable to walk, but can still be carried, a two-person arm carry can be used down the gangplank. It is important that rescuers evaluate the quality of the gangplank (slope, surface, guardrails) before conducting a carry. Carry methods of evacuation from a vessel is one of the safest methods providing there are no concerns

with falling into the water or falling down the gangplank. Lifejackets would be worn during an assisted carry.

Lower to Dockside: The rescue methods described in 6.1 and 6.2 in conjunction with a belay line can be used to lower the rescue subject from the ships deck to dockside. The equipment would be assembled in the same manner, as lifting someone from the hold, except it would be lifting the rescue subject from the deck, over the side of the ship to the dock.

Vessel Crane: Using the on-board crane is an option to remove a rescue subject from the deck of the vessel to dockside. Rescuers must exercise judgment whether or not to use the crane. Crane controls are not usually as finite as operating a descent control device so precise movements can be difficult. Cranes also have the ability to lift several thousand pounds, able to break the rescue equipment used if something should become caught during a lift. The crane can be used if the rescuers are confident they can communicate with the crew, the crane is in good operating condition and an assisted carry is not an option.

Attachment to the crane must be secure, unable to roll-out or off of the hook. Anchorage connectors and carabiners can be used to attach the litters lifting bridle to the crane. The litter must have taglines coming off the ends to stabilize it during the lift and lower. Maintain communications with the crew and be extra cautious during the lifting portion of the rescue. Rarely do items snag or break during lowering, lifting is when items get caught and put under tension.

Lower to Waiting Vessel: The rescue methods described in 6.1 and 6.2 can be used in conjunction with a belay line to lower the rescue subject from the ships deck to the waiting vessel. Other rescue methods must be evaluated before this rescue is conducted. Rescuers must exercise judgment to determine if the ocean swell, waves and wind are calm enough to conduct this rescue. Ideally, the water is calm enough that the waiting vessel can remain stable when the rescue subject is lowered. If the waiting vessel is moving, it is very difficult and dangerous to lower the rescue subject into this area. The equipment can be rigged in the same manner; taglines would be lowered to rescuers on the waiting vessel to direct the rescue subject to the deck. Once the rescue subject is on the deck, the rescue subject shall be simultaneously disconnected from the rescue ropes and secured in the waiting vessel.

Coastguard Helicopter: In emergent cases (severe injury, remote, unstable water and weather), the Coast Guard can be contacted and apprised of the situation. After this call is made, the Coast Guard will likely take over control of the rescue and use a helicopter or Coast Guard vessel to conduct the rescue. Remain available to the Coast Guard; notify them of what equipment, personnel and resources you have to assist with the rescue.

Appendix A

Vancouver Harbour Operations

Sign-off Sheet for Grain Ship Inspector

Name: _____

I have read the following Job Hazard Analysis (JHA's) and was given opportunity for discussion with Supervisor / OSH committee rep.

- ☐ Ship Boarding (RDMIS #651235)
- ☐ Ship Inspection (RDMIS #1616965)
- ☐ Wing Tanks Inspection (RDMIS #651239)

☐ I have reviewed the photographic Ship Holds Inspection Training Manual (September 2009 edition and January 2012 edition) and discussed safety issues with supervisor.

Safety training provided to the inspector includes:

- ☐ Respirator Fit Testing Date: _____
- ☐ Competent Fall Protection (initial course with Gravitec) or an equivalent Date: _____
- ☐ Rescue systems specific to Grain ships Date: _____
- ☐ Standard for Industry First Aid Date: _____
- ☐ Confined Spaces Awareness Date: _____
- ☐ Cold Water Immersion Date: _____
- ☐ Working Safely Around Fumigants Date: _____

Program Training (PI-008)

- ☐ I have taken full course or have gone over course material with Supervisor/Program Officer/Designate at a minimum (Inspector to be enrolled in next available course)

Date of Course _____ Full: Y ☐ N ☐

Skills Check List:

	<u>Date</u>	<u>Ship Name</u>	<u>Observer's Initials</u>
Side Belays as Belayer	<input type="checkbox"/>		
<i>min. 4</i>	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
Side Belays as Climber	<input type="checkbox"/>		
<i>min. 4</i>	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
Vertical Ladder Belays as Belayer	<input type="checkbox"/>		
<i>min. 10</i>	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
Vertical Ladder Belays as Climber	<input type="checkbox"/>		
<i>min. 10</i>	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
Use of Radio Commands <i>min.2</i>			
<input type="checkbox"/> Standard Belay Commands used	<input type="checkbox"/>		
<input type="checkbox"/> Transmission is complete and understood by Recipient	<input type="checkbox"/>		

Vessel Type (Panamax / Handy / Other)

	Date	Ship Name	Observer's Initials
Panamax = Gearless 7-hold	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
Handy = Typically 5-hold bulker with cranes	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
Other	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		

	Date	Ship Name	Observer's Initials
Transfer to Ship from Water Taxi	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
	<input type="checkbox"/>		
Boarding either in rough water or Cancellation due to rough water	<input type="checkbox"/>		

Inspector's Name: _____

I acknowledge that I have received training as detailed above.

Signature _____ Date: _____

On Board Review: Supervisor or Designate

<input type="checkbox"/>	Inspector’s ability to climb safely	Pass	<input type="checkbox"/>	Fail	<input type="checkbox"/>
<input type="checkbox"/>	Demonstration of safe work practices	Pass	<input type="checkbox"/>	Fail	<input type="checkbox"/>
<input type="checkbox"/>	Demonstrated ability to Rig Rescue system	Pass	<input type="checkbox"/>	Fail	<input type="checkbox"/>
<input type="checkbox"/>	Demonstration of ability to inspect and complete paperwork / communicate to vessel	Pass	<input type="checkbox"/>	Fail	<input type="checkbox"/>
<input type="checkbox"/>	Inspector describes commonly infested/contaminated areas	Pass	<input type="checkbox"/>	Fail	<input type="checkbox"/>
<input type="checkbox"/>	Demonstration of safe boarding techniques	Pass	<input type="checkbox"/>	Fail	<input type="checkbox"/>
	Overall Assessment	Pass	<input type="checkbox"/>	Fail	<input type="checkbox"/>

Notes/Comments: _____

Supervisor’s Name: _____

It is my opinion that the inspector named above meets the minimum requirement to perform grain ship inspection as a member of a two-person team, and meets all requirements detailed above.

Signature _____ Date: _____

Note:

This document is a Health and Safety document, intended to sign off an inspector from a health and safety perspective. In most cases, by completing the safety requirements in this document, the experience needed to make program decisions on a vessel will be satisfied, but not necessarily. That determination should be made by the supervisor and/or program officer separately.

Figure A - Belay System

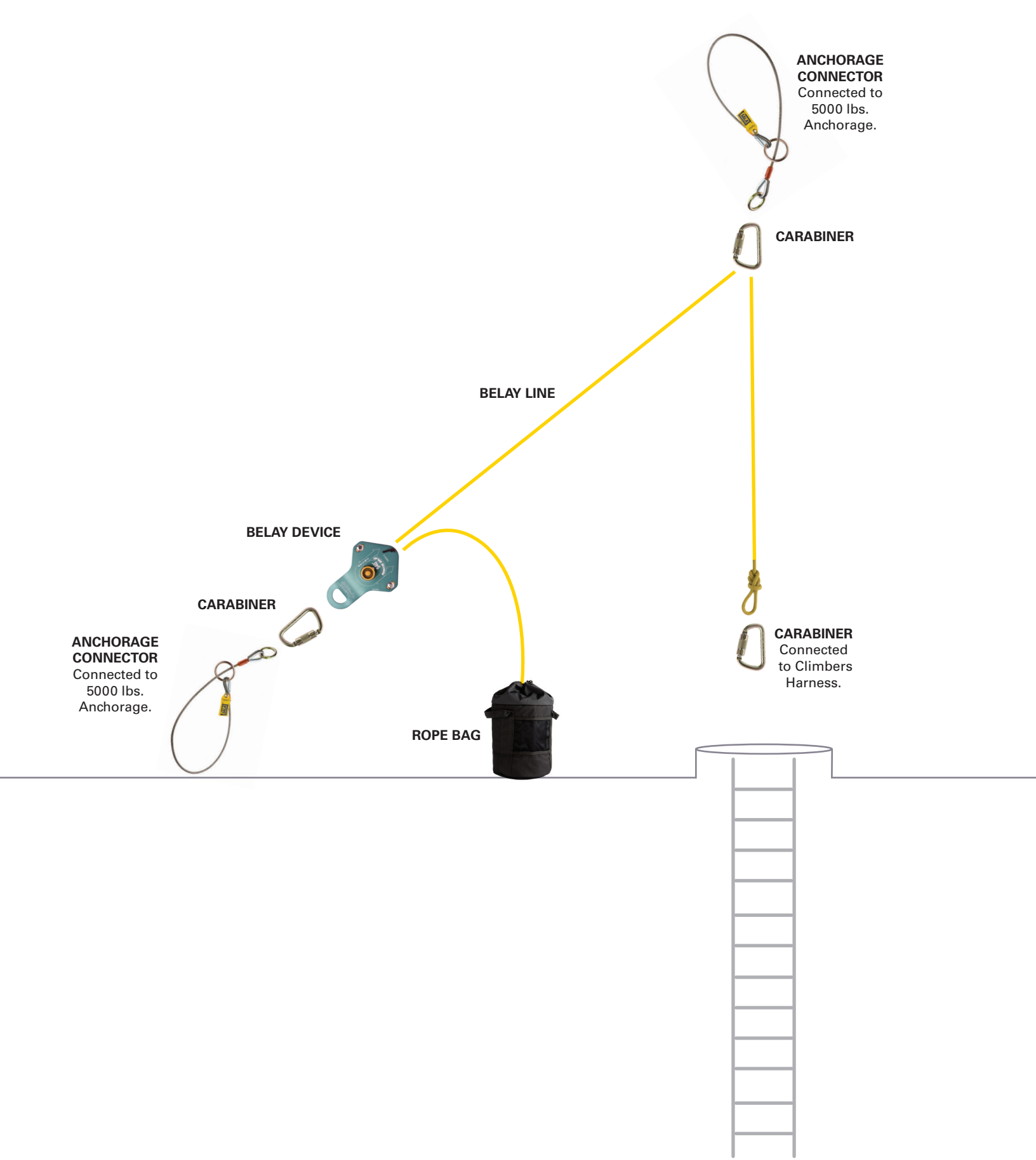


Figure B - Side Frame Inspection

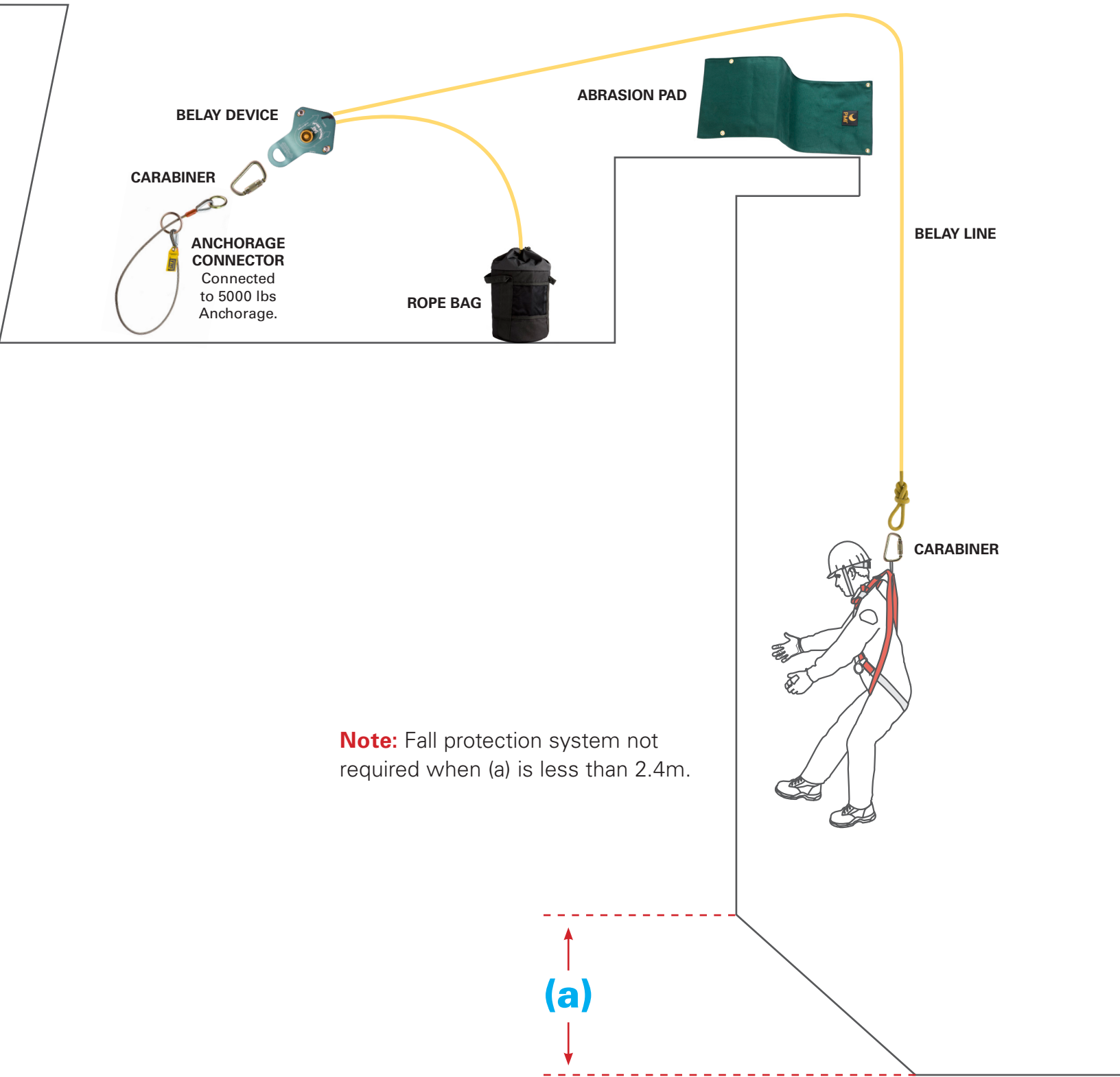


Figure B1 - Side Frame Inspection

The Belay system must be re-anchored when (b) measurement exceeds (a).

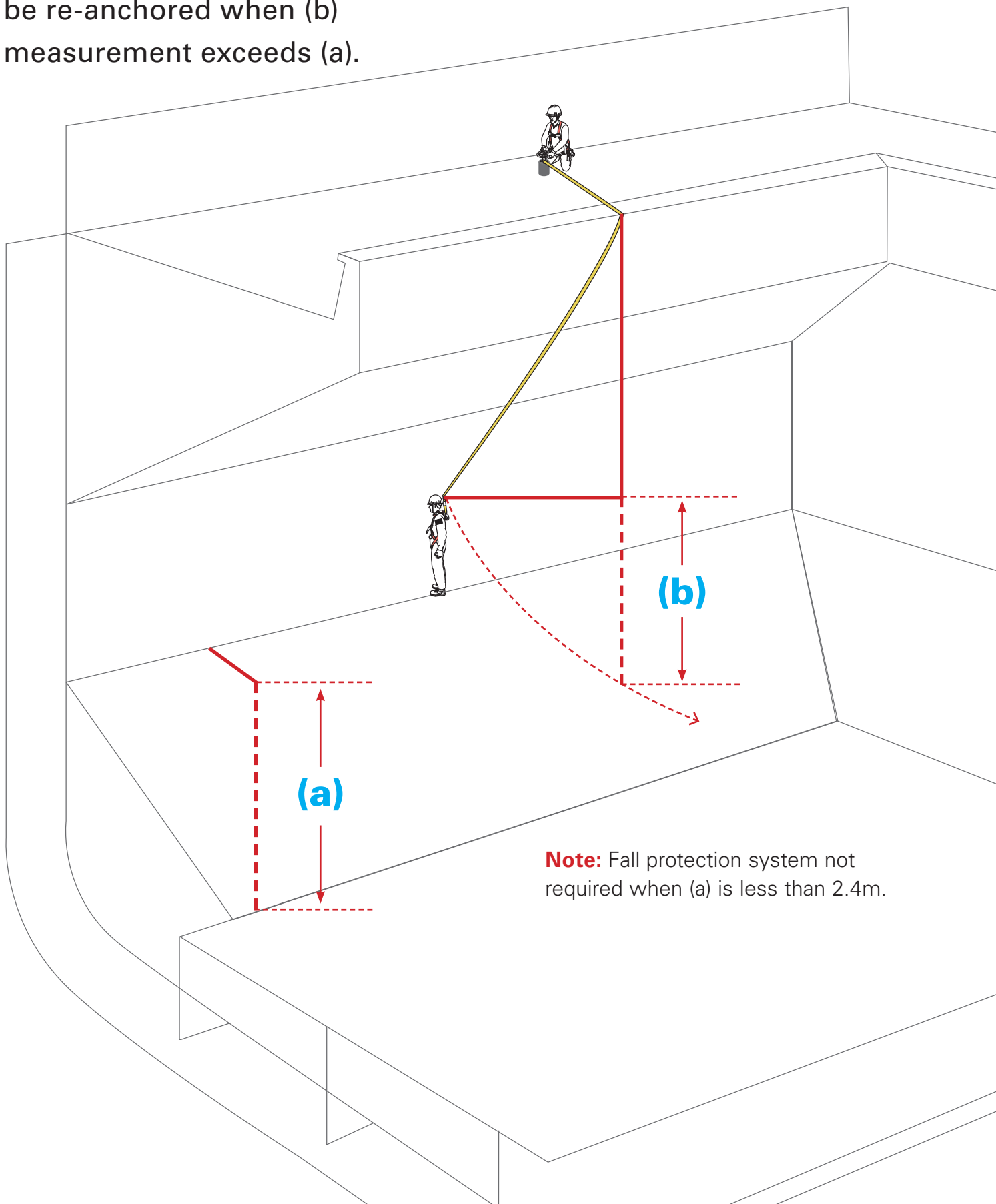
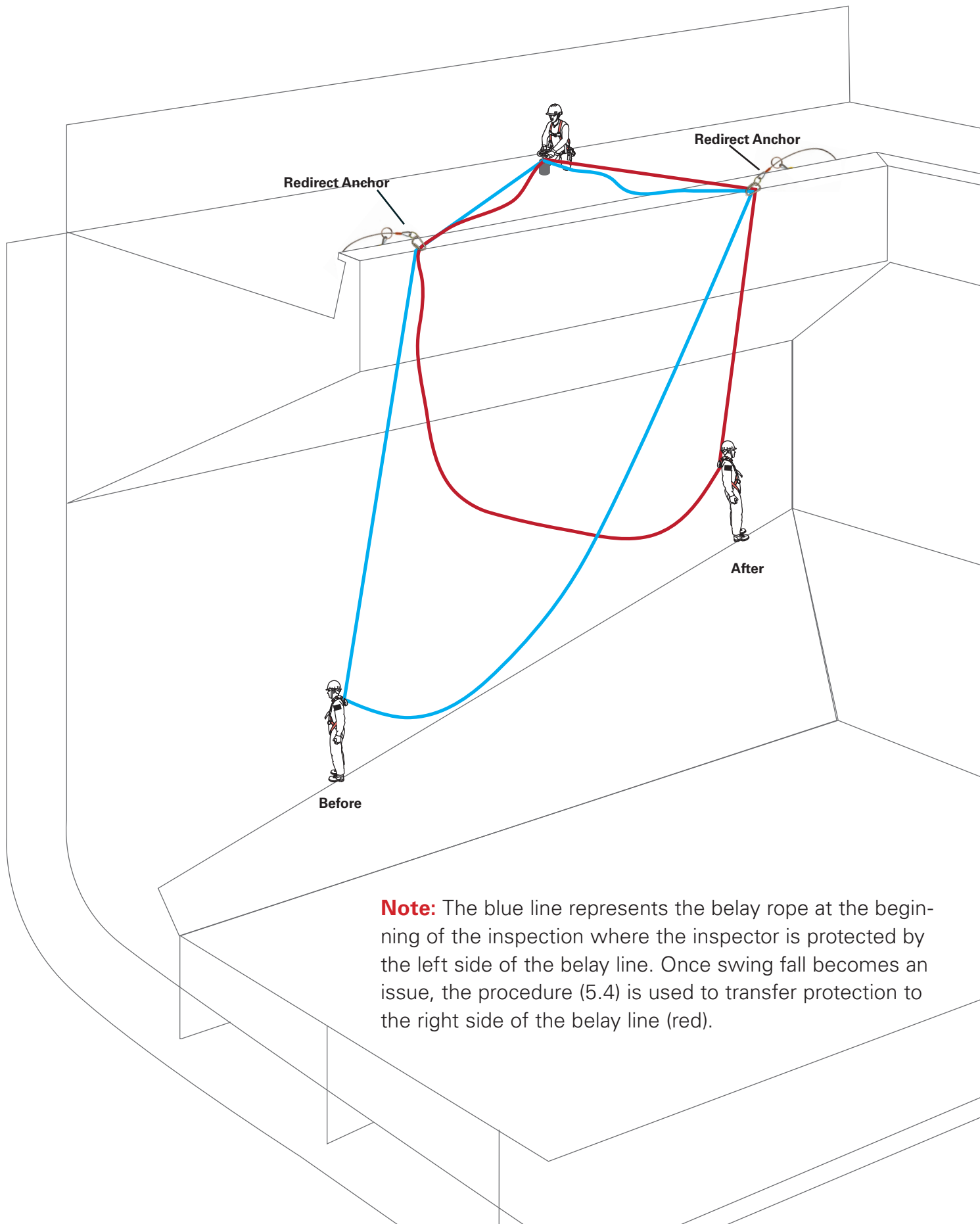


Figure B2 - High Angled Hopper Tanks



Note: The blue line represents the belay rope at the beginning of the inspection where the inspector is protected by the left side of the belay line. Once swing fall becomes an issue, the procedure (5.4) is used to transfer protection to the right side of the belay line (red).

Figure C

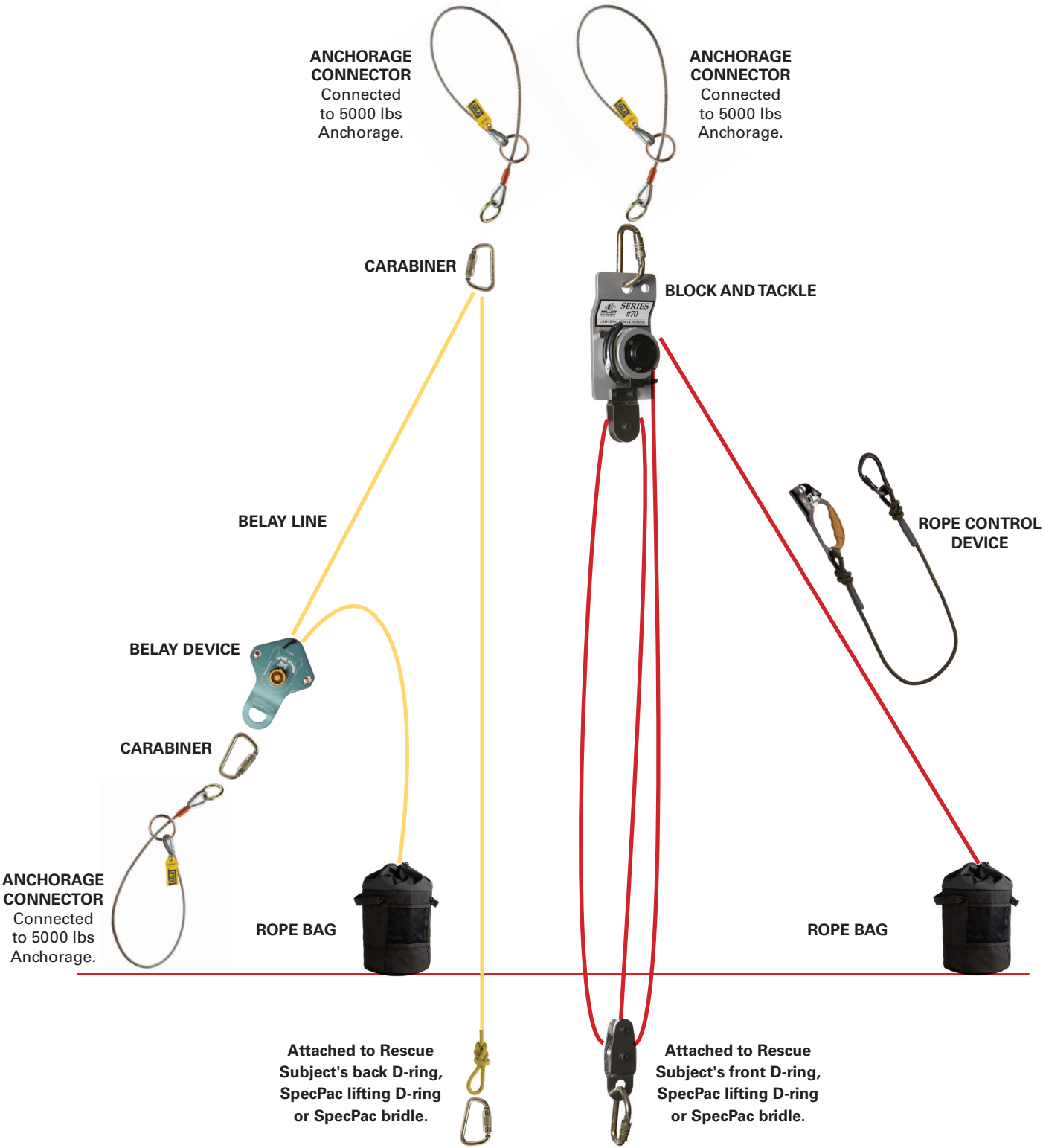


Figure D

