

Aishihik – AHO Surge Chamber Rescue Raft

1.0 Scope

The purpose of the **AHO surge chamber rescue raft** procedure is to provide the steps required to safely evacuate the surge chamber, by raft, via the tailrace.

2.0 Training required

- Workers attending the site and/or performing task(s) in the surge chamber or powerhouse must be trained and competent to perform the tasks listed in this procedure;
- Aishihik hydro facility documented site orientation;
- Proper use of PPE;
- Proper use and understanding of JSA/Tailboards.

3.0 Personal protective equipment (PPE)

Required PPE for this procedure includes, but is not limited to, the following:

- Personal flotation device (PFD);
- Safety footwear;
- Gloves (as req'd);
- Headlamp;
- Safety headwear.

4.0 Pre-conditions

Ensure the following pre-conditions are met:

- Communication via the surge chamber telephone is available.
- Emergency telephone list is posted in the surge chamber.
- All Aishihik hydro units (AH1, AH2, and AH3) are shutdown.
NOTE - the float hanging beside the surge chamber ladder will trip the units if activated.
- Emergency gear in tunnel to surge chamber is available and in good condition.
- Note the location/status of the cooling water and plant sump discharge. Both discharge into the surge chamber and can potentially spray a significant amount of water down onto the raft once it in the water.

Effective Date – June 2016

Review Date – November 2022

Approved by -


Ed Peake, Manager, Operations

Revision Number – Rev. 1

Revision Date – November 2019


D.P. Johnson – Leadhand, Mechanical Maint.

5.0 Reference documents

- Crewsaver; *Welcome To Your Rescue Case User’s Guide*; P/N: 52795011.
- Survivetec Group; Installation instructions and service information for your Rescue Case; P/N: 52786001.
- Survittec Group; *Safety Data Sheet; Life Raft, Self-Inflating, Marine Type, All Configurations*; June 2016.



WARNING – ONLY EVACUATE THE SURGE CHAMBER WHEN ALL OF THE HYDRO UNITS ARE CONFIRMED TO BE SHUT DOWN.

6.0 Procedure

6.1 Gather required safety equipment and PPE

Step 1 – Surge chamber access tunnel

When heading into the surge chamber for refuge, take the totes and raft/paddles #2 (if required) from the access tunnel; just outside the elevator.



NOTE – RECOMMEND TAKING A YEC PORTABLE RADIO FOR USE AT END OF TUNNEL.

Tote contents –

Tote #1		Tote #2	
Qty.	Desc.	Qty.	Desc.
4	PFD (vest); one size	3	PFD (vest); one size
Tote #3		Tote #4	
Qty.	Desc.	Qty.	Desc.
1	PFD (jacket); one size	≈ 30	Water rations
1	PFD (full body suit); one size	1	Yukon #1 first aid kit

Rescue case details

Rescue case consists of:

- One buoyancy tube (raft) with attached floor – there is a pressure relief valve and emergency top-up valve on the buoyancy tube.
- One gas cylinder (CO₂) – When you activate the gas cylinder operating head, the rescue case inflates.
- Five lifelines; one black line on 5 sides of raft.
- Five stabilizing water pockets; underneath the raft.
- One light (with water activating battery)

The following items are attached to the rescue case body:

- 1 - towing line
- 1 - drogue (with 5 m. line); a device external to the raft, attached to the stern, and used to slow the raft down
- 1 - floating knife; the knife is attached to the buoyancy next to the entrance – it can be used to cut the painter line.
- 1 - emergency pack; contains: 1 bailer, one bellow, one waterproof bag. This emergency pack is attached to a patch inside the rescue case.

Step 2 – Surge chamber; floor level

Use the phone in the surge chamber to call SCC and obtain the status of the equipment and the emergency situation in the plant.

DO NOT exit through the tail race until SCC, or other YEC personnel, are aware that you are exiting.

6.3 Deploy the raft



VERIFY RAFT #1 IS IN POSITION; BELOW OPENING IN FENCING.

VERIFY PADDLE BAG #1 IS LOCATED AT TOP OF LADDER.

VERIFY BLACK STRAP IS IN PLACE.



NOTE – INFORM SCC YOU ARE EXITING VIA TUNNEL PRIOR TO DEPLOYING THE RAFT.

Step 1 – Surge chamber; floor level

Below the opening in the surge chamber fencing:

REMOVE the carabiner from the fencing; and,

VERIFY the orange raft strap is connected to the black strap via the carabiner.



Step 2 – Surge chamber; floor level

OPEN the black painter line flap and pull out some rope.



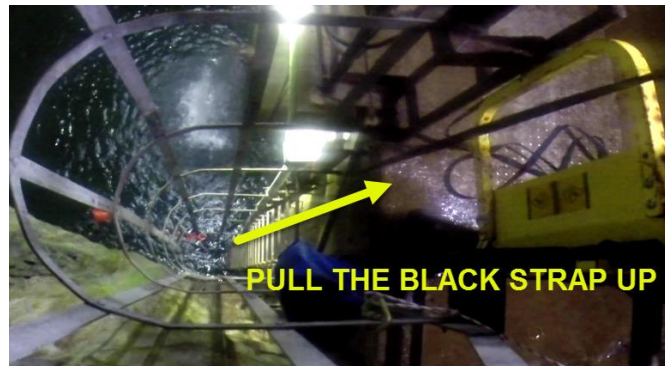
Step 3 – Surge chamber; floor level

THROW the rescue case into the water; through the hole on surge chamber fencing.



Step 4 - Surge chamber; floor level

PULL UP on the black strap at the top of the ladder until the carabineer and white rope approach the surge chamber landing; and, the rope starts to get taut.



Step 5 - Surge chamber; floor level

PULL hard on the black line to inflate the raft (as the white rope will not reach the surge chamber floor level). The raft will inflate quickly; less than 10 seconds.

VERIFY raft has inflated.



Step 6 – Surge chamber; right side of ladder

TIE off excess line at the top of the ladder so the raft is sitting in that water at the base of the ladder.



Step 7 – Surge chamber; left side of ladder cage

LOWER the blue dry bag labelled 'PADDLES #1' inside the ladder cage so that the paddles will be accessible at the raft level.



Step 8 – Surge chamber; floor level

PUT on PFD and headlamp (if not already done). Head protection is recommended for exiting the tunnel.

Step 9 – Surge chamber; water level

DESCEND the ladder to water level.



Step 10 - Surge chamber; water level

VERIFY raft is **FULLY** inflated.

ENTER the raft. The raft has ballast underneath and is very stable.



Step 11 – Surge chamber; water level

REMOVE the paddles and knife from the dry bag.



Step 12 - Surge chamber; water level

Have evacuees descend the ladder and enter the raft.

ONE PERSON AT A TIME.

Notes –

1. Maximum raft occupancy is 6 persons.
2. Distribute people around the raft to keep it stable.

Step 13 - Surge chamber; water level

EXTEND the paddle(s) to the LOCKED position.



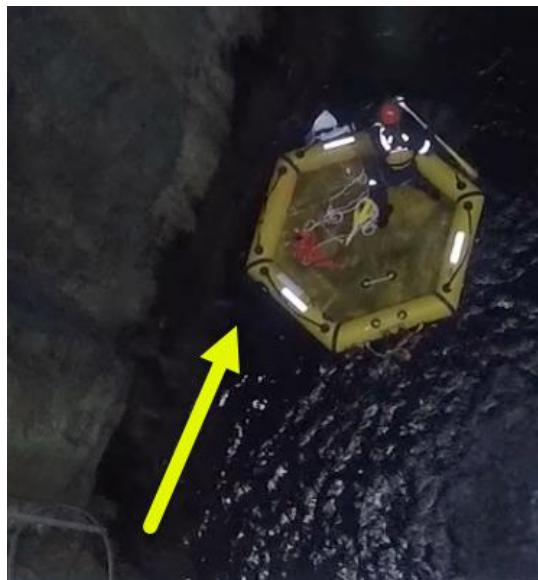
Step 14 - Surge chamber; water level

CUT the line (white rope) to release the raft. Knife is in dry bag; spare knife attached to raft.



Step 15 - Surge chamber; tailrace

PADDLE out of surge chamber; into the tailrace tunnel.



NOTES –

1. Be aware that the water depth in the tunnel varies and you will have to exit the raft and walk out of the tunnel.
2. The raft has ballast underneath and cannot be pulled through shallow water.
3. The ground through the tunnel is very rocky and uneven. Watch your footing when walking.
4. Every effort will be made to have resources available to pick up evacuated personnel from the tunnel entrance.
5. If this is not possible, it is a 2 km walk to the Aishihik hydro plant service building.
6. If you have a radio, contact SCC, or other YEC personnel, as soon as possible upon arriving at the tunnel exit.

6.4 Service

The rescue case raft must be serviced every three (3) years.

The YEC Health and Safety Department will coordinate this service.



SJP Hazard Assessment

Site:	Aishihik Hydro	Safe Job Procedure Title:	AH0 – Surge chamber evacuation raft
Who (normally) completes this job/task:		Operations staff; Engineering Services staff.	

Training Required:
 AH0 Surge chamber evacuation raft procedure; Yukon Energy Safety Training Video – P130 Aishihik Boat Deployment; (AH0) Aishihik site orientation; 1st aid/CPR; rescue breather (SCSR) training.

Minimum PPE required:
 Personal flotation device (PFD), safety footwear, gloves (as req'd); headlamp; safety headwear.
 Fall protection required when deploying raft in a drill/test.

Hazards Checklist	
Can workers be struck by <u>OR</u> contacted by anything while doing this job? <i>Overhead hazards, falling/flying objects, etc.</i>	No
Can workers strike against or make contact with any physical hazards? <i>Electrical hazards, pressure (compressed gas), hot surfaces, mobile/moving equipment, etc.</i>	No
Can workers be exposed to any hazardous conditions? <i>Flammable, toxic, chemical, biological, ergonomic, temperature, noise, etc.</i>	YES
Are workers using hand tools, power tools, or other equipment (<i>mobile, test</i>)?	YES
Can workers slip, trip or fall? <i>Work at height, elevated work, obstructions in work area (piping, substances), open floor etc.</i>	YES
Can worker strain or overexert? <i>Lifting, pushing, pulling, etc.</i>	YES
Can workers be caught in anything? <i>Pinch, crush, etc.</i>	No
Does the work present a hazard for other workers or the general public?	No
Are there any limitations or restrictions to this work area? <i>Access to work area, location of work area, etc.</i>	YES
Is there a requirement for extra first aid attendant or equipment? <i>ETV, medical first responder, etc.</i>	YES

AH0 Surge chamber evacuation raft

Job Step	Hazard	Recommended Action or Procedure
All work associated with this procedure/task at Aishihik Generating Facility	Incapacitated worker; or, plant fire	Develop rescue plan. Identify the following: <ul style="list-style-type: none"> - 1st aid kit location(s); - 1st aid attendant(s); - Fire extinguisher location(s); - Fire alarm. Use YEC 'man-check' procedure (<i>SWP-007; Travelling in remote location or working alone</i>)
	Noise	Hearing PPE; limit exposure
Evacuation via surge chamber/tailrace	Low ambient temperature	Wear adequate clothing for cold temperatures.
	Restricted access to tailrace	Develop rescue plan for tailrace.
	Fall into water	Develop water rescue plan; wear PFD.
	Poor lighting	Use portable lighting (e.g., headlamp) Use temporary lighting for drill/test
Deploy raft	Sprain/strain body parts.	Use proper lifting techniques.
Descend ladder to water level	Fall from height	Maintain 3 points of contact with ladder; do not rush. Fall protection required if drill/test.
	Fall into water	Develop water rescue plan; wear PFD.
Paddle raft	Sprain/strain body parts.	Comfortable body position; use paddle in extended state; avoid over-exertion.
	Fall into water	Develop water rescue plan; wear PFD.
Exit tunnel on foot	Uneven terrain	Take deliberate steps; walk slowly.