## Version History List

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## Document Approval

Connor Turley – CEO – 10th January 2013

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## 1.0 PURPOSE

1.1 This procedure outlines the rescues systems approved by Altius Technical Services (Altius) in line with IRATA regulations and guidelines for the retrieval of personnel involved in industrial rope access training.

## 2.0 SCOPE

2.1 This document aims to identify the possible rescue methods for the situations likely to be found in the rope access training school. With high levels of supervision it is considered to be a controlled environment, and therefore will help to limit the likely rescue scenarios. However, this not intended as an exhaustive guide. The appointed trainer must ensure that the rescue systems and rescue provisions are adequate prior to any rope access training being carried out.

2.2 The appointed trainer must ensure that the most appropriate rescue systems are in place at all times prior to training commencing. All trainees shall be briefed on the rescue systems to be implemented.

## 3.0 RESPONSIBILITIES

3.1 Altius management is responsible for the provision of a safe and healthy workplace for its employees and therefore must ensure that employees are properly trained, know and understand Altius' work methods and procedures. Management will support personnel in their administration of safety activities at the workplace. Personnel will report all incidents to Altius Management. All incidents will be reported in accordance with the incident management systems.

3.2 The Technical Director is responsible for appointing competent personnel as Trainers and Assistant Trainers. The Technical Director is also responsible for ensuring that rescue systems are planned, used and reviewed.

3.3 The Lead Trainer is responsible for ensuring the implementation of rescue procedures and recording all practice and demonstration rescues. They must ensure that all personnel are aware of the rescue systems in place and know the location of rescue equipment. The Trainer must hold a valid first aid certificate and is responsible for ensuring the rescue equipment is complete prior to training and a first aid kit is available.

## 4.0 REQUIREMENTS

4.1 The maximum trainer to trainee ratio will be 6:1. If there are more than 6 trainees on a course, an Assistant Trainer will be employed. The maximum number of trainees during an assessment can be 8.

4.2 The rescue systems must be pre-assembled or readily assembled when needed, prior to training commencing.

4.3 The rescue system will prioritise safety, speed and simplicity. The best method of rescue for the different situations within the training center will be decided before training commences.

4.4 The person to be rescued should be assessed as soon as reasonably practicable for the extent of their injuries and the condition should be relayed to the emergency services, if needed, as soon as possible. The trainer should administer any required first aid until the emergency services arrive on site.

4.5 Where possible a rescue should be conducted without the need for the trainer to go on to the ropes themself. I.e. on to an existing permanent structure, or mobile structure (e.g. step ladder or scaffold tower).

4.6 The second preference for rescue should be that the ropes are pre-rigged for rescue, allowing the trainer or other trained operative to simply lower the casualty to the ground.

4.7 As a last resort, the casualties ropes, or a separate set of ropes can be used to retrieve them. This requires the trainer to climb the ropes and carry out one of a variety of possible rope access rescues, for which he is trained. In this case, consideration should always be given to the effects of 2 person loads on rope access equipment normally rated for single person use. Additional friction karabiners should always be used with descending devices.

4.8 In the event of a rescue, the trainer should also consider the safety of the other trainees. If it is safe to do so, the trainer should instruct all other trainees to descend quickly and calmly.

4.9 Consideration should be given to the mechanical advantage being used in any rescue pulley systems and the resultant loads placed on the anchors and other components in the system.

4.10 It will be normal practice to ensure there is a back-up system in place in case a haul system fails. The back-up system should be independently anchored from the haul system. Where this is not possible the casualties' ropes may be used for a back-up line with the back-up device at the point of the rescuer which will ensure there is no slack in the system which could shock load the system in the event of a fall.

4.11 The rescuer should consider casualty management and keep the casualty as comfortable as possible. If the casualty is unconscious they must be kept upright. This can be achieved by placing a karabiner through their chest harness and attaching to their rope or suitable attachment point. Constant reassurance when necessary must be given to the casualty to prevent any panic or stress which may complicate the rescue.

4.12 The rescue plans shall be discussed the course induction and recorded on Tool Box Talk Safety Sheet - ADS009.

**5.0 RESCUES FROM MOBILE LADDERS/PLATFORMS**

5.1 This is the safest and quickest form of rescue and should be used wherever it is reasonably practicable. The height of the mobile ladder/platform in relation to the roof of the training center should be taken in to consideration.

5.2 On deciding that a rescue is necessary, the level 3 trainer will move the wheeled step ladder or mobile work platform over to underneath the rescuee. The rescuee will, if they are able, step on to the ladder or platform and hold the handrail, thus removing themselves from suspension on the ropes. The rescuee or the trainer will remove the casualties' devices from the ropes, and then the trainer will assist the rescuee down the steps, to ground level.

5.3 Once the rescuee is on the ground they should be made as comfortable as possible. If needed the first aider should treat any injuries according to their priority whilst waiting for emergency services to arrive if they have been alerted.

**6.0 RESCUES FROM GROUND (RIG FOR RESCUE)**

6.1 This is a safe, fast and simple way to carry out a rescue. It is advisable for the trainer to have this system in place when trainees are on the ropes for the very first time or if they are unfamiliar with rope access equipment and manoeuvres. It is also advisable to have this system in place in any area which cannot be reached by step ladders or mobile platforms.

6.2 The ropes will be re-directed at roof level and attached to releasable lowering devices situated so that they can be operated safely from the ground or from an enclosed platform. The trainer will lower the casualty smoothly and gently to the ground. The trainer may ask for assistance from other trainees in operating the lowering devices and receiving the casualty on to the ground. Trainees already holding a valid IRATA qualification will be selected preferably.

6.3 Once the rescuee is on the ground they should be made as comfortable as possible. If needed the first aider should treat any injuries according to their priority whilst waiting for emergency services to arrive if they have been alerted.

**7.0 RESCUES FROM ROPES (SNATCH RESCUES)**

7.0.1 This method of rescue should be considered if the previously described methods are unfeasible.

7.0.2 To lower the rescuee with the rescuer they will be on their ascending or descending equipment with a straight drop below them to the landing area. The rescue will be performed

by accessing the casualty from either above or below. If the situation allows the rescuer should be on an independent rope system. Where this is not practical the rescuer will use the casualties' back-up rope as his working rope and the casualties working line as his back-up. The rescuer will pass the rescuee and perform the rescue from slightly above the rescuee and change into their descending gear.

### 7.1 RESCUING CASUALTY FROM DESCENDING DEVICE

7.1.1

a. Ascend up ropes to rescuee, using their working rope as your back up rope (ensure correct lanyard is fitted to towable back-up devices! e.g. Absorbica pack for ASAP). The rescuee's back-up rope becomes your main working rope. Climb ropes until you are level with the rescuee.

b. Place a second back-up device above the rescuee and then remove your original one. Connect spare cow's tail in to casualty's' D-Ring. Ascend slightly above the casualty and change into your descending device leaving enough room to connect a "Short Link" attachment from the rescuee's sternal D-Ring to the rescuer's descending device Karabiner. Check all attachments.

c. Operate the casualties descending device until their weight is on the "Short Link", then release the rope from their descending device. Once done, check connections again and then you are free to remove the rescuee's back-up device.

d. Place an extra "Friction Karabiner" on your ventral D-ring, running the main control rope through it then locking it. Descend an inch or two to test the weight and friction involved holding control rope above the friction karabiner.

e. Once you are satisfied the system is safe, begin descent using control rope again with friction karabiner for controlling your descent, given the two person load on the equipment. Once at floor level release yourself from the system and seek medical assistance as per rescuee's requirements.

### 7.2 RESCUING CASUALTY FROM ASCENDING DEVICE

7.2.1

a. Ascend up ropes to rescuee, using their working rope as your back up rope (ensure correct lanyard is fitted to trailing back-up devices e.g. Absorbica L57 pack for ASAP). The rescuee's back-up rope becomes your main working rope. Climb ropes until you are level with the rescuee.

b. Remove back-up device below the casualty placing it above them on the same rope. Once done, check connections and then you are free to remove the casualties' back-up device. Climb slightly above the casualty and changeover into descending device. Abseil towards the casualty and lock descending device off, leaving enough room to connect a "Short Link" attachment from the casualties D-Ring to the rescuer's descending device karabiner. Check all attachments. Remove the casualties' foot loop and cows-tail from their hand ascender. Placing karabiner on the end of the detached foot loop, attach it to the maillon rapide below the casualties' chest ascender or sterna D-Ring, if available. Above the casualty thread the foot loop through the karabiner/pulley (if available) on casualties hand ascender. Standing up in the foot loop and lifting the casualty at the same time, gripping the harness webbing around the ventral area, aiding extra lifting purchase. You should now be able to release the casualties' chest ascender from their main rope. Take extreme care lower the casualty down on to the "Short Link" by raising your foot, carefully controlling the rate of descent. The casualties position will change making them rotate back slightly, to make them more comfortable and easier to manage as an unconscious casualty, attach a karabiner to the chest/Sternal D-Ring of the casualty. Then attach it to a suitable point on your system. Place an extra 'friction karabiner' on your ventral D-Ring, running the main control rope through it and locking it. Begin descent holding control rope above the friction karabiner, slowing down your descent, given the two person load on the equipment. Once at floor level release yourself from the system and seek medical assistance as per casualties' requirements.

## 8.0 OTHER ROPE ACCESS RESCUES

8.0.1 If the casualty is unreachable by any of the previously described methods, e.g. they are on a bolted aid climb, and out of reach of the step ladder or a pre-rigged set of ropes, another type of rope access rescue may be necessary.

8.0.2 In most cases the trainer will utilise the rope and hardware in the rescue bag to rig up a new set of ropes next to the casualty. The trainer can then perform a snatch rescue similar to that described above, on to the new set of ropes, and proceed carefully down to the ground with the casualty.

8.0.3 There is almost unlimited scope for variation, and it is not possible to describe every possible scenario here. All main trainers will hold as a minimum an IRATA L3 qualification, and should therefore have the repertoire of skills needed to rescue a casualty from any possible situation that might be found in the training school, using rope access methods. If the procedures outlined above are followed, the need for a rescue that requires the trainer to climb any ropes will be minimised.

## 9.0 SUSPENSION INTOLERANCE (formally known as Suspension Trauma)

9.0.1 Suspension Intolerance is a condition in which a suspended person, e.g. in a harness, can experience certain unpleasant symptoms, which can lead to unconsciousness and eventually death. The reason for this is that the body is not tolerant of being in an upright position and motionless at the same time. Persons likely to be affected are those who are suspended in a generally upright position and who are motionless, for example, when seriously injured or unconscious, or when fastened vertically in a stretcher. NOTE Suspension intolerance is also currently known by several other names, which include suspension trauma, orthostatic intolerance and harness-induced pathology.

9.0.2 The condition has been suspected in cases of mountain climbers who fell and were then suspended for up to several hours. Some of these climbers died after rescue up to eleven days after their fall, for reasons that have been postulated by medical professionals as being due to suspension intolerance. There have also been instances of cave explorers becoming stuck on their ropes and who have died either while still on them or not long after being rescued. The reason for some of these deaths was again attributed to suspension intolerance. Some of the symptoms have been experienced by rescues feigning unconsciousness in rescue training scenarios. The condition has been produced under experimental circumstances in persons who were suspended in a harness in a general upright position and who were motionless. In these clinical trials, where the test subjects were told not to move, most experienced many of the effects of suspension intolerance, some including loss of consciousness, in just a few minutes, in just a few minutes. Others managed for longer before reporting symptoms. A similar situation might arise in a worker who falls into suspension and is not moving, e.g. due to being exhausted, badly injured or unconscious.

9.0.3 Muscular action in moving the legs normally assists the return against gravity of blood in the veins back to the heart. When the body is motionless, these “muscle pumps” do not operate and if the person is in an upright position, an excess of blood pools in the veins of the legs, which are capable of a large expansion and, therefore, have considerable capacity. The excess of blood in the veins is known as Venous Pooling. The retention of blood in the venous system reduces the circulating blood volume and causes a disturbance of the circulatory system. This can lead to a critical reduction of blood supply to the brain and symptoms which include a feeling by the person that they are about to faint, nausea, breathlessness, disrupted vision, paleness, giddiness, localized pain, numbness, hot flushes, initially an increase in pulse and blood pressure and then a decrease in blood pressure below normal. The symptoms are known as pre-syncope and, if the condition is allowed to develop unchecked, can lead to unconsciousness (fainting) – when it is known as syncope – and eventually death. It is possible that other organs critically dependant on a good supply, such as the kidneys, could also suffer damage, with potentially serious consequences. It seems that even the fittest person may not be immune to the effects of suspension intolerance.

9.0.5 Normal movement of the legs (e.g. when ascending, descending or working while suspended) will activate the muscles, which should minimize the risk of excessive venous pooling and the onset of pre-syncope. It is recommended that harness leg-loops are wide and well-padded, as this should help to spread the load and reduce possible restrictions to blood-

flow through the arteries and veins in the legs. The use of a work seat should be considered if one position is expected to be sustained for an extended period.

9.0.6 Although there is little evidence of the efforts of suspension intolerance occurring in the industrial rope access environment, an effective rescue plan is essential to ensure that, following an incident, a casualty can be removed quickly from the suspended position and cared for in a proper manner. The longer the casualty is suspended without moving, the greater the chances there are of the effects of suspension intolerance developing and the more serious it is likely to be.

9.0.7 A person suspended motionless in a harness awaiting rescue is likely to tolerate suspension better with the knees elevated. During rescue, elevation of the legs and movement of them by the casualty or assisted by the rescuer, where safely possible, may be helpful. The casualty should be removed from suspension as soon as possible. This is particularly important for a casualty who is motionless.

9.0.8 Rope Access personnel should be able to recognize the symptoms of suspension pre-syncope. Motionless head-up suspension can lead to pre-syncope and sometimes syncope in most normal subjects in under 1 hour and to 20% of subjects within 10 minutes. Syncope can follow thereafter at an unpredictable time.

9.0.9 During and after rescue, standard first-aid guidance should be followed, with an emphasis on airway, breathing and circulation management (ABC). Assessment of any injuries should include those which may not be apparent, e.g. damage to neck, back and vital internal organs.

9.0.10 In accordance with advise given in a literature research and assessment carried out by the UK Health and Safety Laboratory (HSL) in 2008 (HSE/RR708 Evidence-based review of the current guidance on the first aid measure for suspension trauma), the fully conscious casualty may be laid down and the semi-conscious or unconscious casualty placed in the recovery position (also known as the open airway position). This differs from earlier advice.

9.0.11 All casualties who have been suspended motionless in a harness should be taken to hospital immediately for further professional medical care and observation. Medical personnel should be advised that the casualty may be suffering from effects of suspension intolerance. Those preparing rescue plans should regularly review current best practice.