

Safety Guideline for Caving or Cave Exploration

Introduction

Caving – also known as Spelunking in the United States and Canada and Potholing in the United Kingdom and Ireland – is the recreational of exploring wild caves. This is a serious activity which has hazards where high risk is involved. Hence Organizations are required to conduct the same in a safe manner.

The challenges involved in caving vary according to the Cave being visited. In addition to the total absence of light beyond the entrance, negotiating small pitches, chimneys and water hazards can be difficult. In many cases mapping of Cave is essential / advisable. Formal publications of survey or mapping of Caves may not exist. Sometimes Caving is categorized as an "extreme Adventure Activity".

Special note for Caving:

Caving is a serious and hazardous Activity. Caving requires special skills which are exclusive to the Activity. In India it is not as common as other Adventure Activities like rock climbing, rafting and even paragliding. Less common is for an Organisation to conduct Caving Programs for Participants who are novices.

Hazards in Caving include (but are limited to) steep and slippery terrain, flooding, falling rocks, cold temperature and moisture (related to the risk of hypothermia) and physical exhaustion. Rescuing people from Caves is difficult and time-consuming, and may require high level of rescue skills, training, and equipment. Full-scale Cave rescues involve the efforts of many of rescue workers who may themselves be put in jeopardy in effecting the rescue. So, for organised programs, it is recommended that the Organisation has entire Cave map, information about appropriate artificial anchoring locations are in place and those are in good condition. Participant to Leader ratio is an important factor and should not be compromised upon.

1. For Caves that fall under 'difficult or very difficult' categories, the maximum group size should not exceed 8 Participants.
2. For Caves that fall under 'difficult or very difficult' categories, have one Leader for every two Participants. In addition, Chief Leader should have two people under him only to monitor safety of the group and to be ready to handle any crisis situation.
3. Children should be taken inside a Cave **only** if the Cave is simple to enter and come out of, has a simple walk inside of the Cave that does not involve use of any equipment and ropes. BUT if a Cave involves rappelling and/or ascending and/or traversing on ropes then the event should be kept ONLY for adults.
4. Each team of Cavers should have at least four Leaders. If an injury occurs, one Leader stays with the injured person, one Leader stays with the rest of the group and the remaining two Leaders go out for help, assisting each other with belays etc. wherever required.
5. Particularly recommended for Caving program organised for Participants, Organisation should arrange for its Leaders to undertake one/two visits to Caving route being considered. During these visits or trial runs, some or all of the following tasks could be taken care of: creating anchor stations, mapping the Cave-route, making note of locations for markers with reflective tapes, making note of safe zones, making note of risky & high risk zones, etc. These details are important because of safety measures to be put in (e.g., if the entry to Cave is vertical, and if there are traverses on the route, then marking the ledges for halt points and having anchor stations on those halt points is mandatory, along with information like on how many people can each halt point can accommodate). Such documentation can help plan logistics of the organised program.

Information required for Leaders

- Activity objectives

- Names and qualification of Leadership Team, along with Leaders to Participants ratio
- Back-up plans to be used in emergencies (some information that can be included: how deep can groups enter, timelines including turnaround time/point, keeping an eye on each Participant is must and if needed, guidelines and resources for a Participant who is not feeling well or is not comfortable after entering in to the Cave, process for getting an evacuee out of the Cave.

Documents in Chief Leader's Folder (recommended)

This is important as it: 1. helps Leaders to function without stress 2. enables Leaders to document incidents for later reference 3. helps Organisations to review and improve in future.

- Permissions (registration documents, permits for sites, etc.)
- Personal information and risk undertaking of participants and Leaders
- Risk assessment and mitigation for site
- Copies of
 - o Emergency Response Plan and procedure
 - o Critical Incident Report
 - o Medicine-use Report
 - o Equipment log & equipment damage Report
 - o Feedback forms
- Copy of contract with Service Provider

Criteria for deciding on who cannot participate

This helps Leaders take decisions for excluding a participant and avoid conflicts with them. This needs to be communicated to all Participants at the time of registration.

- Person under the influence of alcohol or drugs
- Person who refuses to follow safe practices (like wearing safety gear)
- Person with medical issue that will pose a risk to the Participant
- Pregnant woman
- A person with known history of claustrophobia (fear of confined spaces)

Qualifications of Leaders: Note: Competence of Leaders comes from experience built up on formal training or experience equivalent to training.

- Formal training: All Leaders
- Basic rock climbing course from reputed Organizations or having equivalent experience in adventure and related activities
- Ability of every Leader should include knowledge & experience of creating appropriate anchors. (e.g., ability to build 'complex anchors': mix of natural & artificial anchors OR only artificial anchors)
- Ability for every Leader should include knowledge & experience of rescue practices.
Preferable:
 - Chief Leader to have undertaken advance rock climbing course, basic and advance mountaineering courses from reputed organisation.
 - There has to be at least 3 to 4 such experienced Leaders in this team.
 - Assistant Leaders to have undertaken basic and advance mountaineering course from Mountaineering Institutes
 - Chief Leader to have undertaken course in outdoor Leadership from reputed organisation

- Certifications (check if current or lapsed)
 - Chief Leader to have current certification in First Aid & CPR from reputed organisation
 - Preferable:
- All Assistant Leaders to have current certification in Wilderness First Aid & CPR from reputed Organizations
- Experience
 - Leading groups on high adventure activities
 - Undertaken personal caving and Cave exploration expeditions
 - Few of the Leadership members should have an experience in conducting rescue training sessions (involves stretcher carrying / handling techniques, rescue of a person in lowering, raising or taking casualty on traverses etc)
 - Conducting climbing / caving sessions for novices
 - Handling emergencies, both medical and non-medical
- Skills
 - Ability to set up anchoring stations on natural and artificial surfaces (anchor systems, belaying, rescue operations etc)
 - Ability to supervise members of Leadership Team
 - Ability to create a safe environment outside and inside the caving site; context: approach to enter and exit the Cave, instructing Participants on what to do and what not to do, and monitoring for safety throughout a session
 - Creating a 'Fast Response Force' by delegating roles / responsibilities (for this the Chief Leader should know strengths & weakness of her/his entire team)
 - Conservative approach in risk management while handling emergencies
 - Group management skills
 - Ability to be assertive when taking decisions, especially in preventing risky situations and while handling emergencies
 - Proficiency in best practices for environmental safety - [Refer to Leave Minimum Impact Practices.](#)

Equipment:

Refer to relevant SOP created by Organisation for the specific activity site for selecting equipment. Specifications about technical equipment that may be used for this Activity are given in [Appendix 1.](#)

For Caving, use of following equipment is recommended:

- Technical equipment
 1. Low-stretch or semi-static ropes of 11 mm. or 12 mm. diameter. Consider acquiring specialised ropes which are 'edge proof' or ropes which have a comparatively tougher sheath.
 2. Equipment required for creating anchor stations and mid-way protection placement
 3. Padded harnesses (full body, or seat harness with chest harnesses)
 4. Helmets with facility for fitting headlamps
 5. Full body suits and gloves (not mittens) for protection against abrasion from scraping
 6. Consider elbow and knee protection pads
 7. Rappelling and ascending devices (for vertical caving)
 8. Wire ladders (for vertical caving)
 9. Head lamps
- Emergency kit
 1. At least two cell phones, with important contact numbers entered in

2. Requisite number of toy walkie-talkie sets (to be included if feasible)

First aid kit - Indicative list of items for [First-aid kit are given in Appendix 2.](#)

IMPORTANT SAFETY NOTE:

Communication is crucial in this Adventure Activity, and detailed information on the cave layout, logistics, data from records of previous expeditions, etc. should be used to decide quantity and type of any equipment.

Pre-activity actions by Leaders: This stage is crucial in order to avoid surprises that can affect safety during operations.

- Check Equipment for damage prior to beginning activity - this has to be the second check. The first check should be done at office / store before packing the equipment.
- Review of medical history of Participants to ensure that preventive and curative aspects are in place (e.g., medicines in duplicate in known locations). If the Cave is very narrow at some places, then people with Claustrophobia should not be taken inside the Cave.
- Refer to weather reports for that particular area where the activity is supposed to take place. This is crucial especially if the region is known to have rains in the time period when the event has been planned.
- Check Leaders to Participants ratio in the context of Activity site; some of these parameters are:
 - Nature of caving path/route: whether it involves a simple walk over easily negotiable terrain or has elements like rappelling, ascending ropes, traversing with the help of ropes, change-over situations across protection-equipment and anchoring stations, etc.
 - The approach to the entrance of the Cave: if this is hazardous then this may need a Leader to act as an escort for Participants as they make their way to the entrance. In difficult terrain fixed rope is must.
- Notify people outside Cave (e.g., with local government authority, Organization's representative/ Leader) about expected time of return so that people outside the Cave can organise a search/ rescue party (experienced team) if the group has not returned by the stipulated time and / or if people outside the Cave don't receive any communication from Leader / instructor inside the Cave about 'activity getting delayed'.
- Ensure each member has helmet-mounted lights (hands-free) with extra batteries. Two lights per person is recommended.
- Dry run is a must: at least two members of the Leadership Team members should visit the path/ route in the Cave one day prior to the actual Activity to do complete assessment of the entire route. Most of the following actions are to be undertaken during such a dry run.
- Outside a Cave, if natural resources like trees and boulders are to be used for anchoring set-up, ensure that the right kind of trees / boulders are selected (locals may be consulted for information about trees).
- In Caving Activity, while creating anchors inside a Cave avoid using boulders, natural holes, etc. since using artificial light makes it difficult to correctly assess appropriateness of such resources. Hence creating artificial anchors inside Caves is recommended.

Safety Note:

- Check for environmental hazard on activity site (reptiles/insects/fallen branches/loose rocks, if there is water inside the Cave, then what is the water level etc.)

- use rope protectors to protect ropes from abrasion
- Check possibility of flooding during the expedition. Rainwater getting logged underground can flood a Cave very fast, and people can get trapped in passages. For organised programs, avoid entering a Cave if there is strong possibility of flooding.
- Set-up activity, if feasible, by fixing ropes as necessary on the planned Cave-route – this can be done only if, as recommended above, the dry run has been undertaken one day prior to group's program. Ensure that: all over-the-edge and rope-on-rope points are protected by appropriate rope protection gear.

Briefing to Participants: This briefing makes Participants aware of a) their responsibility towards their own safety and the group's safety, b) consequences if they fail to follow instructions c) the role of Leaders during operations and in case of an emergency.

- Description of Activity in detail:
 - Explanation of the entire caving experience, preferably with the help of photographs and video clips shot during the dry run, and the map of the Cave
 - Equipment that is to be used – this will have been covered in the training program for Cavers who are going to enter a difficult-category Cave.
 - Emphasis on 'what not to do' (e.g., 'do not get detached from the safety system and anchoring stations', do not unlock carabiners at any point of time between change-over points, etc.)
 - Check any fresh health issue that Leaders should be aware of: Chief Leader to ascertain this before starting the activity
- Inherent risks in the activity & consequences if process is not adhered to: a Leader to clearly state this to the whole group – this is a must
- Responsibility of Participants towards their own safety and others' safety: a Leader to clearly state the expectations from all in the context of safety
- Mandatory practices
- For Participants: all personal gear, shoes not to be removed, no getting ditched from the anchoring system or from the rope anytime, all instructions to be followed, ask questions for clarifications, do not take any decision on your own, always consult a person from the Leadership team / organisers etc.
- Safety precautions for minimization of risks
- Leaders to double check all points of anchor in the anchoring system
- Leaders to double check all personal equipment when it has been put on anyone
- Leaders to monitor the group at all times (note, adults in group of Participants should only help in non-technical aspects, and Leadership Team is responsible for the safety of the whole group)
- Chief Leader to check qualification of Participants.
- If the Caving route involves with high adventure activities like rappelling, ascending on ropes, and traversing on ropes then previous experience of such activities is a must. A Participant without such experience is not to be taken on such Caving routes. (refer to the section 'Training for Participants') To be done only if a Participant is found to be struggling .
- Policy of 'no alcohol, tobacco and drugs': Leaders to ensure that this is followed strictly by everyone in the whole group
- Leaders' authority to stop activity when necessary: Leaders to be assertive about this when safety is involved (e.g., environmental factors, damage to equipment, uncooperative behaviour of Participants, etc.)
- Minimisation of environmental impact, no littering
- No damage to nearby cultural structures like shrines
- At least one trowel in group-kit in case anyone wants to answer nature's call during the program.

- Leader to make clear expectations from everyone in emergency situations well as for emergencies

Training of Participants

Some or all of the following aspects will be required, depending on the features of the Cave where Activity is to be conducted.

1. Familiarity with emergency response plan including 'lost person protocol'
2. Familiarity with communication equipment and communication signals for situations like when the group is strung out in single file in narrow passages

Note: it may be necessary to conduct an exclusive refresher session prior to undertaking Caving Activity, for a duration that ensures that each Participant is adept and confident at using all equipment in dark environment.

Instructions for activity / operations: This small list of points can be a check-list for Leaders to help in smooth operations.

- Rescue equipment in place with emergency kit and first aid kit right from the beginning
- Ensure that each Participant's hair, loose clothing and jewellery will stay clear of the personal protective equipment, Caving gear, anchors, etc.
- Last check on the equipment for each person just before he/she starts the activity using the 'Touch-Say-Confirm' method: touch each item of personal gear on the Participant while saying its name aloud to confirm that all equipment is firmly in place.
- Entire group uses head lamps for the activity.
- Compared to daylight conditions, it is hard to spot damage to ropes, tapes, rope slings, anchors becoming risky, so being cautious during the entire activity is really expected by the 'Leadership Team'.
- Do not rush through this activity at any point of time; treat each Participant as a fresh one, and do all required safety checks at each stage
- Organization's Leaders to monitor crucial points and actions of staff for safety (and not leave it to Service Provider's staff)
- E.g., check anchor systems to see if they are safe, check that all staff / Activity Leaders are self-anchored, that each Participant receives a double-check on their personal gear before starting the activity at each halt point
 - Ensure sequence of activities and coverage of all actions for prevention of risks as per Risk Matrix
 - At certain places inside the Cave, Participants may have to pass through chimney or narrow passage where a great amount of friction can take place while passing through. This can cause damage soft equipment like: ropes, harness, slings (tape or rope) etc, so checking the equipment before the activity, even during the activity and after the activity is MUST.
 - Monitor changes in environment: look for loose rocks, landslides, changes manifesting due to incoming weather (like rising water levels), harmful animals, etc.
 - Monitor for environmental impact – repeat expectations from Participants if necessary
 - Mandatory practices
- For Leadership Team members: role modelling, self-anchored at any point of time, keeping close eye on each Participant, anchors, environment-safe practices

Service Providers: Safety of the participant is the primary responsibility of the organisation.

- Chief Leader to review contract signed with outsourced Service Provider
- Chief Leader to review the qualification of all staff members of the outsourced service provider, and their ability to appropriately set up this Activity.

- Chief Leader to review respective roles and responsibilities with staff of outsourced Service Provider
- Chief Leader to ensure that all the safety guidelines and SOPs prepared for safe conduct of the Adventure Activity are clearly communicated to outsourced Service Provider and ensure implementation of the same during Activity.

Wind up: This stage is important for organisations to review the activity and make improvements in future.

- Inspect equipment, pack equipment according to norms. If you use 'tape knots' to join the tapes or 'rope knots' to join rope cords / slings, after the activity, on the location itself open all the knots and then store the equipment.
- Pack separately equipment that needs repairs or is to be discarded: attach a tag to each item with a note on damage
- Do not pack wet gear like ropes and harnesses
 - Fill up all the documents required
 - Review and feedback (Participants & Leadership Team)
- Communicate to the Organization's office any feedback that has not been recorded in paperwork

- end of safety guideline -

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