Safety Plan

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Revision 5.0

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Revision History

Version	Date	Author	Remarks
1.0	2019-01-14	SM	Initial revision
1.0.1	2019-01-15	SM	Minor formatting and language changes, language versions; PA systems added for superjeep tours
	2020-01-15	SM	Reviewed with no change
	2021-01-17	SM	Reviewed with no change
2.0	2022-08-13	SM	General review and procedures adapted based on past years experience. High alpine tours added.
2.0.1	2022-08-15	SM	Formatting and layout changes. Risk assessments and Action Plans combined for each Safety Plan and formatting updated.
2.0.2	2022-08-23	SM	Work procedures reviewed and clarified.
2.1	2022-08-26	SM	Missing Trip Sheet added back in. Added paragraph numbering to facilitate referencing specific sections from other documents.
2.2	2022-09-01	SM	Inspection Plan added to the appendix
2.3	2022-11-05	SM	Icelandic translation revised
2.3.1	2022-11-07	SM	Cancellation authority clarified as a guiding principle. AIMG AT1 requirement added for Section 2.2 (202).
2.3.2	2022-11-08	SM	Page layout / formatting changes only
2.4	2022-11-27	SM	Redundant risk assessments / action plans replaced with cross references to other safety plans to facilitate updates.
2.4.1	2022-11-30	SM	Safety Plan 1 - risk assessment / action plans expanded to address loss of vehicle control and passenger illness (feedback from VAKINN review)
3.0	2023-09-30	SM	Document Conversion to LaTeX to improve change tracking, especially across language versions (format change only). [1]
3.0.1	2023-10-02	SM	Text annotations and in-text cross reference links added (work in progress).
3.1	2023-10-03	SM	Updated with feedback from VJP. [2].
3.2	2023-10-06	SM	Illustrations added for the most common access routes (see section 7.6).
4.0	2024-08-20	SM	Annual document review. Risk assessments and action plans reviewed. Access route to Breiðamerkurjökull updated[3], including Table 3.1. Minor changes and clarifications in the guiding principles. Overall spelling and cosmetic corrections.
4.1	2024-09-16	SM	Further expansion on overhead hazards in response to a recent accident (see section 3.2.1).[4]
4.1.1	2024-09-20	SM	Clarified risk assessment qualifications in section 3.2.1.[5].
5.0	2025-07-22	SM	Annual document review. Added a new section on movements over floating ice covers (section 5), which includes additional work procedures and guide qualification requirements to address this particular environment, and expanded on site-specific risk assessments (section 1.2.1 and work procedures in section 6). Clarified wording throughout the document.

Contents

1 Overview and General Remarks

The presented safety plans are cumulative / additive for combined activities (a glacier hike may include a superjeep tour component to reach the desired location, etc.). Guides must be familiar with and adhere to all safety plans that apply to any single tour. To facilitate this, the relevant risk assessments and action plans include all tour components (for example, the risks of superjeep transportation are also referred to within the assessment of ice cave tours).

This document may be available in multiple languages. The English version is the authoritative document and should be referred to whenever translations are unclear or differences seem to arise.

1.1 Guiding Principles

All our tours must be safe, protect the environment, reliable[6], and informative. Customers should feel well cared for and receive excellent value for their money.

The principle of safety equally applies to customers, guides, and third parties. Activities that may increase risk to bystanders in any way (such as ice climbing above other groups) are not acceptable.

The guide onsite always has full and final authority to cancel, change, or shorten any tour if they deem the weather or conditions unsuitable or have any other safety concerns, regardless of promises made by third parties or customer opinion. This also extends to evaluating the suitability of customers' abilities or equipment for the intended program.

A unified Incident Report template has been drafted to be used in all activities; this is presented in the appendix and serves to provide a general structure for any incident reports, but may be modified as needed to document specific incidents. A unified Trip Sheet has been drafted as well to document each tour (also in the appendix). As an alternative to the Trip Sheet, the same information may be recorded electronically. The graphical Contingency Plan, also found in the appendix, applies to all tours. Finally, the Inspection Plan lists the frequency and some checkpoints for item inspections (and, in the form of a separate spreadsheet, can serve to record inspections).

The overall structure of our safety plan and operation is based on the guidelines of the Icelandic VAKINN quality standards on tourism.

The following guidelines also universally apply to all safety plans and work procedures included in this document:

Current and available

All safety plans must be reviewed at least annually, or whenever changes to the working environment or new insights present themselves.

Revisions to this safety plan must be documented on the preceding page, including date, author, and a short summary of changes made.

The safety plans in their latest revision should be accessible to the public, online and/or in printed form.

Safety plans must be updated to adhere to new regulations put into place by updated guidelines provided by VAKINN and/or the Icelandic Tourist Board.

Incident reports should generally be made public in a redacted fashion (with any personally identifiable information removed or redacted).

Clear language

The terms "MUST", "MUST NOT", "SHOULD", "MAY", when written in capital letters, are used with specific meanings[7]:

"MUST" is a rule that shall be fulfilled without exception.
Example: All vehicles MUST have all inspections and licenses required by law. (a deviation from this rule is not acceptable).

"MUST NOT" is a rule in which the following statement is not allowed to occur.
Example: On glaciated areas, passengers MUST NOT be allowed to exit vehicles except in safe location. (it is not acceptable for passengers to leave vehicles in unsafe areas of the glacier).

"SHOULD" is a rule that shall be fulfilled whenever possible, but may be disregarded under certain circumstances.
Example: Vehicles SHOULD have both VHF and Tetra radios. (it may be acceptable to just carry either VHF or Tetra under certain circumstances).

"MAY" is a rule that is entirely at the guide's discretion.
Example: Passengers MAY use their own headlights instead of the ones provided. (either will work just fine).

"INSPECTION" means: Thorough visual inspection for defects (including a full or partial disassembly as required), a full test for appropriate function, and repair or replacement of any components found to be defective.

Documented

Inspection of all items shall be documented in suitable form, including at least the date, item inspected, name of person performing the inspection, and outcome (passed / repaired / replaced). Training exercises (e.g. crevasse rescue practice, drive training, etc.) of guides shall be documented in suitable form, including at least date, location, participants, duration and purpose of the training exercise.

1.2 Risk Assessments

The risk assessments in the following safety plans should address all known risks that pertain to particular activities. However, guides must always be mindful of unforeseen circumstances and identify additional risks during the tour.

The Severity and Likelihood values range from 1-3 (equating to low, moderate, high). The resulting Risk Value is calculated as a multiple of severity and likelihood. Risk Values of 3 and higher need to be addressed with appropriate action plans to reduce the likelihood, severity, or both (highlighted red in the adjacent table.[8]

		Likelihood		
		1	2	3
Severity	1	1	2	**3**
	2	2	**4**	**6**
	3	**3**	**6**	**9**

TABLE 1.1: *Risk Value calculation*

Incident reports and general sharing of observations and knowledge, both within the company and with external parties, are an important tool to identify new or changed risks and develop better mitigation strategies.

1.2.1 Site-Specific Risk Assessments

All guides must participate in the maintenance of shared, site-specific risk assessment records where available[9]. New assessments must be submitted in a timely fashion, as early as possible and no later than 24 hours after the completion of the tour.

Site specific risk assessments shared by others must be taken into consideration when guiding. The shared database must be checked prior to each departure.

1.3 Communications

Háfjall ehf. is a very small company that has based its marketing and reputation on all interactions being directly with the co-owner and sole guide. Consequently, all observations and experiences gained throughout the tours will directly influence all aspects of operation, from timing to group size and equipment choice, to guarantee a high quality and safe tour environment.

On the other hand, in the case of emergencies the small size of this company may also become a drawback, since the resources available in the "back office" or in form of additional guides are very limited. However, in practice this has never led to problems resolving issues that arose during the tours. The range of operations overlaps with numerous other tour operators, and mutual help and assistance has a long standing tradition in this area across all companies and their guides.

Besides working to build a good relationship with other tour operators, transparency of operation and multiple communications channels are seen as important factors towards ensuring the best possible communications in the case of emergency. Live location tracking can also be easily shared with any emergency responders if needed.

Starting in late 2024, a more formal cooperation between small operators in the area has been initiated with a shared TETRA channel and coordination through online messaging keeping everybody informed on each operator's plans for any given day, further advancing the above mentioned informal mutual help and assistance.

1.4 Remarks on the 2025 Revision

The past year has been quite an interesting one, with Stephan having been deeply involved in the formation and ongoing work of the Fagráð, an expert council which is intended to assist both the Vatnajökull National Park (now part of the Icelandic Environmental Protection Agency[A]) and the companies operating within the area to guarantee a high standard of safety on their operations.

As in 2024, all tours were successful with no major incidents occurring, medical or otherwise.

The purchase of B2-class footwear mentioned in the previous year's remarks proved extremely useful and the selection of sizes has been slowly expanded to be able to accommodate as many customer requests as possible.

Perhaps the most prominent change to this year's revision is a new section covering movement over frozen ice covers. As the glaciers and their access routes change, we are seeing an increased amount of open water in front of some glacier areas. In the winter months moving over those ice covers has become a popular shortcut for accessing the glaciers. Frozen lakes are also becoming popular destinations in other areas, and we believe it is critical to be proactive about this development by establishing good work procedures and training standards.

There is a tremendous amount of experience with traveling over, and working on, frozen ice covers for example in the northern regions of Canada, and the work procedures and certification requirements were in large part based on publications by the Government of Alberta, and existing ice rescue and safety training programs[10].

There is also a new section in the guiding principles on This was added to emphasize on the commitment to participating on a shared space for site-specific risk assessments. The *GLACIS* database was created during the last winter to track and monitor the development of ice caves based on the shared input and experience from all guides visiting those locations, and has great potential for also being useful for other glacier related activities. Therefore this section was added to the overall guiding principles, rather than just in the section specific to ice caves (event though this is where its main focus currently lies).

1.5 Remarks on the 2024 Revision

From 2024 onwards, we will include a brief section on our review of the previous year, how well the safety plan has served and the motivation behind any changes.

Fortunately the previous year has been a successful and safe time, which few noteworthy incidents observed. Technical difficulties with vehicles or equipment could all be resolved easily. No major medical incidents occurred during any tours, although there were a few cuts and scrapes as one would expect. A review of the risk assessment and action plans in this document brought no major changes, but a few points were rephrased or expanded for clarity.

One interesting observation over the previous year was that despite prior communication with most customers, there have been misunderstandings about what constitutes appropriate footwear for various activities - in particular with ice climbing the difference between soft hiking boots (even if they provide reasonable ankle support) and a more rigid B2 class mountaineering boots can make or break the customer's experience. We have also encountered customers whose footwear was quite inappropriate for any glacier travel, which required substantial changes in our tour plans to ensure their safety. To address this, we have decided to purchase a selection of B2-class boots and make them available for rental to our customers in the future.

The other noteworthy change in the past year has been that we purchased two additional TETRA radios that not only carries our own private talk group (plus the usual range of open ones), but also includes talk groups of a number of other companies in the region. This facilitates cooperation and

[A] www.nattura.is

enhances mutual safety, because the radios' locations are also shared on the Sitewatch real-time tracking platform.

After our VAKINN certification in March of 2023, we decided to decline the annual re-certification. We believe that while the overall safety criteria of VAKINN are certainly valuable, and we will continue to adhere to them, the overall work procedures required by the standard are very clearly designed for larger companies with multi-level hierarchies. Those do not fit our business of a single-person company very well and create an overhead that reduces transparency and effectiveness.

Over the past years we have also repeatedly observed companies with VAKINN certifications that were very clearly in violation of these standards and safety criteria, showing that in its current form VAKINN is not an effective tool for ensuring client safety or tour quality for companies of any size.

Overall, we have come to the conclusion that for a company of our size the VAKINN certification process is a very substantial expense in both time and money that cannot be justified and is better invested in more tangible and effective measures, such as the purchase of improved equipment outlined above.

1.5.1 The Need for a 4.1 Revision

In late August of this year, a terrible accident occurred on a summer ice cave tour on Vatnajökull. I have written an extensive opinion piece on the subject[B], which expanded on my strongly held belief that the most critical element to providing safe outdoors experiences is a guide who has both the tools and training to competently assess the environment they are confronted with, and also the freedom to make good and safe decisions (which requires a supportive company culture that encourages independent decisions which prioritize safety over all other aspects of a tour).

This has been a cornerstone of our safety plans and work procedures from the beginning, and the only conclusion can be to push even harder for highly competent guides throughout the industry, and to support guides who are willing to further their skills with an increased and improved array of training opportunities.

One aspect that has been implicit was hazard identification. A fall hazard is usually very obvious and requires little explanation, but overhead hazards on the glacier are much more difficult to identify and we decided to make these points more explicit by including them as a separate section in the work procedures for general tours on lowland glaciers (section 3.2.1).

After all, good and safe decision making can only occur if those decisions are derived from an explicit awareness and analysis.

The decision to include those in a more general section, as opposed to including them in the work procedures for ice cave tours in particular, is based on the fact that those overhead hazards may in fact occur on any excursion onto the glacier (or indeed even just standing in front of one). It would therefore provide a false sense of security to isolate them to a specific activity, implying that the risk is not worth considering at any other time. Indeed, the only aspect that may change is how long a person may be exposed to a certain risk - the character of an ice cave tour means that overhead hazards are a constant concern throughout the majority of the tour duration, whereas on glacier hikes exposure may be limited to a single brief moment.

[B] www.stepman.is/2024/08/27/thoughts-on-recent-events/

2 Safety Plan – Superjeep tours and General Activities

This safety plan applies to all tours in which passengers are primarily transported in modified vehicles, and other activities are limited to short walks around points of interest with minimal exposure to risks. The work procedures outlined here also serve as a foundation for all other activities.

2.1 Risk Assessment and Action Plan

Risk Assessment

The risk assessment can be found in table 2.1.

Date		**Service / product**		**Person responsible**		
2024-08-20		All outdoor activities, in particular superjeep tours		Stephan Mantler		
P#	**Risk**	**Risk description**	**Control measures**	**S**	**L**	**R**
1	Fall from height	Client stumbles / slips on uneven terrain, snow, ice	Rules on work procedures	2	2	**4**
1	Nature	Volcanic eruption / ash / glacial outburst	Guides are well informed about changes in activity and follow public recommendations when planning tours.	**3**	1	**3**
1	Other	Vehicle stuck in crevasse / river / ...	Rules on work procedures	**3**	1	**3**
1	Other	Vehicle rollover or crash after driving off road / loss of control	Rules on work procedures, driver training, reduced vehicle speed. Use of seatbelts etc.	**3**	1	**3**
1	Passenger illness	Onset or worsening of passenger illness in remote area	Passengers informed of remoteness. Medical fact sheet. Rules on work procedures.	2	1	2
1	Blow	Jolt from uneven car ride	Suitable vehicle, reduced speed on difficult roads, mandatory use of seatbelts.	1	2	2
1	Fall on level ground	Client stumbles upon entering / exiting vehicle	Rules on work procedures	1	1	1

TABLE 2.1: *Risk Assessment for Superjeep Tours and General Activities. (S = Severity; L = Likelihood; R = Risk Value). Risk Values shown in* ***bold red*** *require further mitigation by action plans.*

Action Plan

For each of the risks identified above as requiring further mitigation, action plans were devised as follows:

Client falls on uneven terrain, snow, ice. Passengers are assisted entering / leaving vehicle. The walking route is chosen to minimize slipping risk and avoid exposure to unsafe heights. Passengers are reminded

Before			After		
S	L	**R**	S	L	**R**
2	2	**4**	1	1	1

to not be distracted by taking pictures or other activities while walking. "Microspike" crampons are carried on all winter tours and supplied to clients as required.

Volcanic eruption / ash / glacial outburst. Measures to reduce the *likelihood* of this risk: Geophysical activities that may hit at an imminent eruption must be taken into account and tour plans adjusted accordingly to avoid potentially dangerous areas.

Before			After		
S	L	**R**	S	L	**R**
3	1	**3**	2	1	2

Measures to reduce the *severity* of this risk: In case of eruption / outburst during tour, guides shall bring passengers to suitable shelter, away from harm, and contact authorities about recommended further procedures.

Vehicle failure / impassable roads prevent tour completion. On tours into uninhabited / remote terrain, vehicles shall carry emergency food supplies for 24hr. Guides shall be aware of and able to contact other operators or jeep drivers in the area, in case assistance is required. If possible, tours shall be planned to include an 'alternative' route or be changed if there is danger of eg. a river becoming impassable.

Before			After		
S	L	**R**	S	L	**R**
3	1	**3**	1	1	1

Vehicle rollover or crash after driving off road / loss of control. Measures to reduce the *likelihood* of this risk: Drivers are required to familiarize themselves with vehicles and practice driving in difficult conditions. Tours must be changed or canceled in bad weather.

Before			After		
S	L	**R**	S	L	**R**
3	1	**3**	2	1	2

Measures to reduce the *severity* of this risk: drivers are required to adjust speed according to road conditions and weather, and have full authority to cancel or change tours as required for safe operation. Clients must wear seat belts at all times.

2.2 Work Procedures

Ratio. The guide to customer ratio MUST be at most 14 customers to each guide.

Weather. Tours MUST be canceled if severe weather is forecast for the planned area of the tour, or if severe weather is anticipated on the way to the meeting point for the guide or clients. Severe weather includes but is not limited to yellow or orange weather warnings, severely limited visibility (due to wind driven snow or other effects), or sustained winds or wind gusts of more than 20 m/sec on dry roads, and 15 m/sec if roads are snow or ice covered. Local effects such as wind shadows or funneling effects MUST be taken into account when making this determination.

Client Profile. There is no absolute upper or lower age limit for these types of activities, as long as an approved child restraint can be fitted to the vehicles. Guides MUST take particular care to drive gently on rough terrain with smaller children, and keep the tour duration and difficulty level flexible. Clients with physical or mental special needs are welcome and MUST be accommodated as best is possible.

2.2.1 Mandatory Equipment

Vehicles. Vehicles MUST fulfill all required licenses and examinations. All driving MUST be documented either on paper or electronically, including fuel consumption, regular and additional maintenance, etc. A daily summary is sufficient if it lists all stops / tours made during the day.

GPS. A GPS device MUST be on board for all excursions. The GPS device SHOULD include tracks for known routes relevant to each tour. GPS devices MUST be inspected monthly. Maps downloaded to the device SHOULD be at the latest available revision. Smartphones are acceptable as substitutions for dedicated GPS devices for excursions remaining on public roads only (regular and mountain roads), provided they can be charged in the vehicle. All navigation functions must be functional on the device without cell service ("offline").

Communications. Handheld or built-in VHF, TETRA radios, or satellite communications devices (text messaging or phone) MUST be carried on all tours that leave inhabited areas. These devices MUST be inspected at least yearly.

Tracking. In uninhabited areas with limited TETRA coverage, or if no TETRA radio is being carried, an alternative remote tracking / emergency signaling device (PLB, eg. SPOT / inReach) MUST be carried.

Crampons. Full-sized crampons or "microspikes" for all passengers MUST be on the vehicle for winter tours entering glaciated or heavily snowed terrain. Crampons and microspikes MUST be inspected yearly. Guides MAY choose between full-sized crampons and "microspikes" if those are deemed adequate for the excursion.

Ice Axe. At least one ice axe for glacier travel MUST be carried on the vehicle for all tours entering glaciated or heavily snowed terrain. Ice axes MUST be inspected annually.

Safety Rope and Accessories. A safety rope of at least 30m length, and all required accessories for a functioning crevasse rescue system, MUST be carried on the vehicle for all tours entering glaciated terrain. All components MUST be inspected at least once every two months.

First Aid Kit. A first aid kit MUST be carried on all tours. The first aid kit MUST be accessible from inside the passenger room. The kit MUST be inspected annually for completeness and expiry of medications, by a pharmacy or physician.

Cleaning and Disinfection. All vehicles SHOULD carry 1-2 small to medium sized garbage bags; a small bottle of hand sanitizer; and a roll of kitchen paper, workshop towels or similar.

Puncture Repair Kit. A complete puncture repair kit SHOULD be carried on all tours outside of inhabited areas, unless the vehicle carries a spare tire. The kit MUST be inspected annually for completeness and usability.

Tire Inflation. For tours outside of inhabited areas, vehicles fitted with a central tire inflation system MUST carry an extra length of tubing; vehicles not fitted with such a system MUST carry an air hose suitable for inflating all tires from a built-in or external air compressor. These items MUST be inspected annually.

Recovery Rope. A heavy duty tow rope suitable for recovering stuck vehicles MUST be carried on all vehicles driving outside of inhabited areas. Vehicles MUST be fitted with suitable attachment points on the front and rear.

Tool Kit. For tours outside of inhabited areas, vehicles MUST carry a tool kit adequate for addressing likely issues (socket set for lug nuts, drive shafts, etc.).

Head Light. A headlamp and spare batteries MUST be carried on all vehicles.

Public Address System. A public address (PA) system SHOULD be fitted on vehicles with 5 or more passengers to facilitate in-car guidance.

2.2.2 Drivers / Guides

In most tours, the drivers will also be guiding the tour (giving verbal information and instructions). On certain occasions (for example, when driving with a group with their own guide) these roles may be split up.

- All drivers MUST have the required driving permits.
- All guides MUST be certified "Wilderness First Responder" (WFR), or have an equivalent or better certification.
- All drivers MUST be familiar with all aspects of the routes chosen for a particular tour, and MUST have suitable qualifications for navigation.
- All drivers SHOULD practice driving in difficult conditions (deep snow, river crossings, etc.) and self-recovery of a stuck vehicle at least twice per year.
- All guides MUST have a "Crevasse Rescue" course, and MUST practice crevasse rescue at least once per year.
- All guides MUST practice GPS and compass navigation, including inter- and resection using paper maps, at least once per year.
- All guides MUST be fluent in English, or in the native language of the group they are traveling with.
- Guides SHOULD be familiar with and use the in-vehicle PA system if available.
- New guides MUST receive training by lead guides or other suitable staff concerning the vision, ideals and guidelines of the company, communication with guests, and group management.
- All guides MUST be aware of the Civil Protection emergency response plans and regulations (see), and follow them in full if necessary.
- All drivers MUST comply with all rules, regulations and recommendations for nature protection.

2.2.3 Check List – Before tour

- Passenger list and tour plan / schedule in the vehicle
- Weather forecast and road conditions have been evaluated and are compatible with the tour.
- Trail(s) to be taken are known to be passable. Trails on glaciated terrain were inspected no more than one week earlier.
- Brief visual inspection of vehicle
- Vehicle fuel tank is full
- First aid kit in vehicle and complete
- Fire extinguisher in vehicle
- Mobile phone and mobile communications devices are fully charged and working
- GPS device is charged, working and contains required maps / tracks
- Additional equipment as required for the tour is complete and in good order
- Check function of air compressor / tire inflation system
- Check function of recovery winch if fitted

2.2.4 Start of and during the tour

- Introduce guide(s) by name.
- Offer passengers to approach guides about any relevant medical conditions, recent illnesses, medications, allergies etc. that may be relevant.
- Give passengers a brief overview of the entire tour; frequently update about upcoming stops / events. Particularly note upcoming bathroom stops, especially if there won't be another for a longer time.
- Assist passengers entering / exiting the vehicle.
- Ensure passengers are wearing seat belts at all times, and are comfortable in the vehicle (air conditioning etc.)
- Vehicle speed must always be in accordance to prevailing road surface and weather conditions, even if this means changes in tour schedule.
- Offer additional information to pass the time while driving. Guides should have extensive knowledge about Icelandic life and culture, attempt to answer questions truthfully and not provide as facts any
- information they are uncertain about or hearsay.
- On each stop, inform passengers about the purpose of the stop, approximate duration, things of note. Particularly stress any dangers that may be present (slippery ground, waves, cliffs, etc.).
- On glaciated areas, passengers MUST NOT be allowed to exit vehicles except in safe locations
- Crevassed areas must be avoided wherever possible.
- All environmental damage from driving must be avoided or kept to an absolute minimum where unavoidable.
- Rivers MUST NOT be crossed unless the crossing can be made safely in both directions. The weather forecast must be taken into consideration when making this decision.
- Drivers / guides always have full authority to cancel or change any aspects of the tour that are deemed unsafe (black ice on roads, strong wind, etc.).

2.2.5 Check List – After the tour

- Check vehicle for forgotten items belonging to passengers.
- Visually inspect and clean all items used
- Refill main vehicle tank and auxiliary tank (if fitted).
- Check engine oil level, transmission fluid, power steering, and brake fluid levels. If levels are low, refill and note in trip report.
- Refill windshield washer fluid if needed.
- Clean interior and exterior vehicle.
- Fill out a short trip report indicating time of departure / return, route and distance driven, fuel consumed, names of lead / assistant guide(s), number of passengers, weather, and any items of note.

2.3 Contingency Plan

A unified contingency plan has been drafted and is available in the appendix.

The following specific risks have been identified for this tour:

- Passenger falls into crevasse
- Vehicle gets stuck in crevasse
- Vehicle unable to cross river

To address these risks, the following rules have been put in place in the Work Procedures:

- Passengers are not allowed to exit vehicles on glaciated areas, except for locations known to be safe
- Driving over crevassed areas must be avoided.
- Trails on glaciated areas are frequently inspected.
- Suitable communications devices on all tours.
- Rivers MUST NOT be crossed unless it is safe to do so in both directions.

2.4 Incident Report

A unified incident report has been drafted and is available in the appendix.

3 Safety Plan – Low Land Hikes and Hikes on Outlet Glaciers

This safety plan applies to hiking excursions on outlet glaciers (hard ice) and in sparsely populated areas at lower altitudes.

The term "non trivial navigation" is used to describe tours that explore areas that are outside inhabited areas, on unmarked paths, and/or in areas the guides do not know exceedingly well.

This risk assessment applies to both glacier hikes and ice climbing tours on all outlet glaciers. Some of the risk values may vary with the character of the tour, glacier environment, route choice, and weather, but all factors must always be taken into account[11].

***Everything* is remote.** For all lowland and glacier hikes, it must always be expected that outside assistance may be several hours away. Below is an estimate of glaciers / locations and approximate times until *definitive help*[C] can be expected. Other tour guides may be able to assist very quickly, but cannot be fully relied upon due to the unknown schedule, experience, and equipment carried by other tour operators.

Table 3.1 is based on prior experience both guiding and as a member of Search & Rescue performing rescue operations in the respective areas, and shows approximate access times to reach the edge of the glacier[D]. Most of the described access routes are illustrated in section 7.6.

It is clear that even for benign incidents, long wait times and hypothermia are a risk factor that needs to be covered by suitable Work Procedures, safety equipment, and requiring all guides to be WFR certified and able to address such situations in the field.

3.1 Risk Assessment and Action Plan

Risk Assessment

The risk assessment can be found in table 3.2 below.

Action Plan

For each of the risks identified above as requiring further mitigation, action plans were devised as follows:

Client stumbles on uneven terrain. Clients are required to wear adequate footwear that is compatible with crampon use. Guides must instruct clients with suitable walking technique and assist them navigating particularly challenging sections.

Before			After		
S	L	**R**	S	L	**R**
2	2	**4**	2	1	2

Heightened danger of winter ice. Clients must be protected from sliding on blue winter ice by suitable route choice, fixed or running ropes, and proper group management. Crampons for winter ice must be inspected for sharpness and refurbished if necessary.

Before			After		
S	L	**R**	S	L	**R**
2	2	**4**	2	1	2

[C] ie. suitably equipped Search & Rescue that can prepare and accomplish an extraction of an injured person
[D] One may reasonably add up to another hour if the incident site is higher up on the glacier
[E] Summer conditions may require longer access hike due to soft ground that is impassable for vehicles

Glacier / Tour Areas	Closest Support	drive	hike	total	Remarks
Breiðamerkurjökull (West)	Höfn	1:30	0:10	1:40	Drivable almost all the way to edge of glacier[E].
Breiðamerkurjökull (East)	Höfn	1:30	0:20	1:50	New track is drivable to within about 350m of the footbridge.
Fall- & Virkisjökull	Öræfi	0:15	0:15	0:30	Taking lower road to the edge of the moraine.
Fláajökull (East)	Höfn	0:45	1:00	1:45	Parking at the new foot bridge, or at the trail head further east. Access may be accomplished by traversing the foot bridge over Hólmsá and up over Jökulfell (reaching a more central part of the glacier), or following the nature trail circling east and north towards the glacier at its easternmost periphery.
Fláajökull (West)	Höfn	0:45	0:45	1:30	Parking at Bólstaðafoss. Fastest access is by circling around the base of Hálsar, but may be difficult to navigate with a stretcher (two or three passages of moderate scrambling). Easiest (but longer) is straight north, going up along Bólstaðafoss.
Skálafells- & Sultartungnajökull	Höfn	1:15	0:30	1:45	Best access is from either the end of the old road (east side, difficult and potential mud), or along F985 (steep but straightforward access down onto the glacier).

TABLE 3.1: *Approximate access times (in h:mm) to the edge of some frequently accessed glaciers. This list is subject to change as glaciers and access routes evolve. Drive and hike times assume winter conditions and carrying heavy/bulky loads for rescue ops. Extraction routes may be different and take longer to ensure safe and gentle transportation.*

Fall due to rope / equipment misuse. All interactions of clients with safety equipment such as fall protections, carabiners, etc. must be well coached and supervised. See also the relevant Work Procedure.

Before			After		
S	L	**R**	S	L	**R**
3	1	3	1	1	1

Blow from falling material. Measures to reduce the *severity* of this risk: Helmets are required on all tours.
Measures to reduce the *likelihood* of this risk: Routes must be planned in a way that avoids exposure to unsafe areas / situations.

Before			After		
S	L	**R**	S	L	**R**
3	1	3	2	1	2

Fall into crevasse. Measures to reduce the *severity* of this risk: Helmets required on all tours. Climbing harnesses required on terrain where crevasses cannot be excluded with certainty. Guides must carry all required equipment for successful rescue / self rescue on all tours.
Measures to reduce the *likelihood* of this risk: Route must avoid exposure to falling risks, or rope must be used.

Before			After		
S	L	**R**	S	L	**R**
3	1	3	2	1	2

Date	Service / product	Person responsible
2024-08-20	Low Land and Glacier hikes	Stephan Mantler

P#	Risk	Risk description	Control measures	S	L	R
	See also table 2.1. Table 5.1 may also apply.					
2	Fall from height	Client stumbles on uneven terrain	Rules on work procedures	2	2	**4**
2	Fall from height	Heightened danger of winter ice[F]	Rules on work procedures	2	2	**4**
2	Fall from height	Fall due to rope / equipment misuse	Rules on work procedures	**3**	1	**3**
2	Blow	Blow from falling material	Rules on work procedures	**3**	1	**3**
2	Fall from height	Fall into crevasse	Rules on work procedures	**3**	1	**3**
2	Get lost	Client separated from group	Rules on work procedures	2	1	2
2	Heat or cold	Hypothermia due to exposure	Briefing on adequate clothing, rules on work procedures	1	1	1
2	Overstrain, stress	Fatigue due to improper fitness / tour duration	Private tours have flexible duration / arrangement	1	1	1
2	Edged material	Self injury with ice axe / crampons	Rules on work procedures	1	1	1

TABLE 3.2: *Risk Assessment for Low Land Hikes and Hikes on Outlet Glaciers. (S = Severity; L = Likelihood; R = Risk Value). Risk Values shown in* ***bold red*** *require further mitigation by action plans.*

3.2 Work Procedures

Ratio. The guide to customer ratio MUST be at most 10 customers to each guide for sparsely populated areas, and at most 8 customers to each guide for excursions on outlet glaciers.

Weather. Tours MUST be canceled if severe weather is forecast for the planned area of the tour, or if severe weather is anticipated on the way to the meeting point for the guide or clients. Severe weather includes but is not limited to yellow or orange weather warnings, severely limited visibility (due to wind driven snow or other effects), or sustained winds or wind gusts of more than 15 m/sec. Local effects such as wind shadows or funnelling effects MUST be taken into account when making this determination. If the wind chill[G] is $-20\,^{\circ}\mathrm{C}$ or below, tours MUST be adjusted and/or shortened in accordance with customers' clothing and overall equipment.

Client Profile. There is no absolute upper or lower age limit for shorter hikes, as long as suitable safety gear is available and children are able to follow instructions [H]. Guides MUST keep the tour duration and difficulty level as flexible as possible, and plan for a fast and easy return if necessary. Clients with physical or mental special needs are welcome and MUST be accommodated if it is safely possible. Clients are encouraged to fill out and carry on them a short medical fact sheet that contains information which may be relevant in emergencies (this way privacy is guaranteed, and guides will be able to access critical information if needed). For day tours, the minimum age is 10 years.

[G] the effective temperature considering present wind speed; see for example www.weather.gov/epz/wxcalc_windchill

[H] This is more a matter of mental age than physical age, as well as language

Rope and Equipment use. All rope use MUST be in accordance to the standards and best practices defined by AIMG, IFMGA, and/or IRATA/SPRAT. Whenever possible, safety equipment MUST be set up such that clients have minimal opportunities to misuse it. Whenever clients are connected to ropes (no matter whether it is for short rope support or sustained ice climbing), they MUST be either tied in directly with a suitable knot[I], or a triple-action carabiner MUST be used that protects against inadvertent opening. For movement along fixed ropes using a cowtail / via ferrata set[J], clients MUST be coached in correct passage over rope sections, and MUST be observed doing so themselves on safe terrain before continuing onwards. Autonomous movement in vertical terrain (such as rappels) MUST always be backed up by a second, independent rope system that cannot be manipulated by the client (tied directly into the harness, or clipped into a dorsal attachment point on an industrial harness). Whenever possible, different rope colors SHOULD be used for main and backup systems for clear visual separation.

Winter ice. On glaciers that exhibit polished winter ice and other smooth / slippery surfaces, clients MUST be adequately protected from uncontrolled slides after stumbling. This SHOULD be done by making efficient use of static ropes or efficient belays whenever possible. As an alternative in near horizontal terrain and for groups of at most four clients, guides with HIG2[K] or better qualification MAY also use effective group control / spotting by keeping the group closely spaced and walking a short distance below them.[12].

Guides MUST always work under the assumption that clients cannot reliably self arrest in such situations.

3.2.1 Special Considerations for Overhead Hazards on Glaciers

Overhead hazards are often more difficult to assess or control than fall hazards, and therefore particular care must be taken to avoid exposure to them. These hazards may occur independent of the character of the tour, or time of year and exposure to them may not be immediately obvious. To properly identify any hazards, guides MUST pay particular attention to the following points when assessing the safety of glacial structures:

- As a general rule, ice is very weak in tension[L] and therefore any poorly supported structures (leaning flakes or walls, flat ceilings, etc.) demand very close evaluation and MUST be avoided or removed in a controlled fashion prior to approaching them.
- Stress fractures MUST be inspected carefully, as they indicate internal or external forces, movement, or poorly supported structures that exceeded the strength of the ice (such as in the underside of a flat roof).
- Seemingly well supported structures (as seen from below) may be compromised due to cracks forming from the top that may not be visible at all from underneath —even if the interior is clear blue ice.
- Fragments that may be dislodged by ropes moving over the ice or the actions of other people MUST always be removed.
- Weathering crust[M] can dramatically reduce the tensile strength of ice structures to a depth of 50-100cm, and may also obscure other defects. The outer layers of sunbaked structures MUST therefore be assumed to be dead weight and have no load bearing capacity.

[I] For example, Figure-8 or Bowline with Yosemite finish

[J] A short, y-shaped pair of ropes connected to the harness and with carabiners on the end of each section for attachment to and movement along a permanently installed rope or cable

[K] AIMG Hard Ice Guide 2

[L] Being pulled apart, as opposed to compressive forces.

[M] Also known as sunbaked ice

- Any surface defects that may collect melt- or rainwater demands particularly careful examination during the warmer months.
- Embedded ash layers provide very low shear resistance, especially if saturated by water.
- Dirt, ash and other superficial deposits may obscure stress fractures and other defects.
- In addition to the immediate structure, guides must also evaluate the surrounding area on the glacier to gain a better picture of how the various forces are at work internal to the structure in question.
- Rapid temperature changes, heavy rain, and late summer all drive very rapid change and demand particular care.

Those assessments MUST be performed before and continually throughout every visit, without exception. Guides MUST NOT simply rely on yesterday's situation or trust other guides' decision to enter a location. In any situation where the assessment cannot be done easily and with absolute certainty (ie. well accessible, glass clear ice without any visible defects or loose parts, no risk of slush or other material overhead, etc.), the assessment MUST be performed by a guide certified as AIMG Hard Ice 3, or with an equivalent or higher certification. Guides SHOULD, whenever possible, document their assessments in a suitable fashion (taking pictures or narrated videos of any structures or locations of concern).

3.2.2 Mandatory Equipment

GPS and Navigation. A handheld GPS device MUST be carried on all tours, including one set of spare batteries. A suitable smartphone MAY be substituted for the GPS, together with a fully charged powerbank. The GPS SHOULD include existing maps and tracks relevant to the chosen route. Either a second fully functioning GPS device, or a handheld compass and backup paper or plasticized map, at a scale no less than 1:100.000, MUST be carried on all tours where navigation is non-trivial.

Radio. A Tetra radio MUST be carried on all tours.

Distress Signals. A signal whistle must be carried on all tours. A flare gun and red/green flares SHOULD be carried on tours where navigation is non-trivial.

First Aid. An extended "mountaineering" first aid kit must be carried on all tours.

Water. Guides SHOULD carry at least 500ml of water on excursions longer than 1hr.

Food. On excursions longer than 2 hours, guides SHOULD carry one energy bar or similar emergency ration each for two clients (ie. 3 bars for 6 clients, or 4 for 8).

Emergency Shelter. Guides MUST carry a suitable emergency shelter, or materials to improvise one, on all excursions longer than 2 hours.

Spare Clothing. Guides MUST carry spare wool socks and a primaloft, down, or similar insulating jacket on all excursions longer than 2 hours.

Dry Bag. First aid kit, emergency shelter, and spare clothing MUST be packed in a dry bag, vacuum sealed bag, or other waterproof enclosure.

Headlight. Guides MUST carry a head light and spare batteries on all tours.

Walking Sticks. Guides SHOULD carry a collapsible set of walking sticks on all tours.

3.2.3 Mandatory Equipment – Glaciated Environments

In addition, for hikes onto outlet glaciers the following equipment is also mandatory:

Harness. All clients MUST wear properly fitting harnesses.

Helmet. Guides and clients MUST wear approved helmets.

Crampons. Guides and clients MUST wear proper mountaineering type crampons (microspikes are not acceptable).

Ice Axe. Clients SHOULD carry walking ice axes (depending on the terrain and character of the tour, guides MAY choose to not have clients use them). Guides MUST carry an ice axe or ice climbing tool as well as a spare (axe or tool)..

Crevasse Rescue. All guides MUST carry a full crevasse rescue kit (rope, ice screws and other hardware as required to build a functioning pulley system).

Spare Crampon. Guides MUST carry a spare set of crampons, including normal and extended center bars, or material to improvise all individual components of a lost or broken crampon.

Spare Clothing. as above, but must be carried on all tours.

3.2.4 Guides

- All guides MUST have a current Wilderness First Responder (WFR), equivalent, or better certification.
- All guides MUST have an AIMG Hard Ice 2, equivalent, or better qualification for hikes on outlet glaciers and AIMG Alpine Trekking 1, equivalent, or better qualification for lowland hikes into remote areas.
- All guides MUST be fluent in English, or in the native language of the group they are traveling with.
- New guides MUST receive training by lead guides or other suitable staff concerning the vision, ideals and guidelines of the company, communication with guests, and group management.
- All guides MUST be aware of the Civil Protection emergency response plans and regulations (see), and follow them in full if necessary.
- All guides MUST practice crevasse rescue at least twice per year.
- All guides MUST practice avalanche search and rescue at least once per year.

3.2.5 Check List – Before Tour

- Passenger list and tour plan / schedule finalized
- Medical factsheets printed for each client to fill out and carry on them (has already been sent out by mail beforehand).
- Weather forecast and road conditions have been evaluated and are compatible with the tour
- Trail(s) to be taken are known to be passable. Trails on glaciated terrain were inspected no more than one week earlier.
- First aid kit in backpack is complete
- Mobile phone and Tetra radio are charged and working
- GPS device working and contains required maps / tracks
- Safety equipment is available and complete for all clients, including extra sizes.

3.2.6 Start of and during the Tour

- Introduce guide(s) by name.
- Offer passengers to approach guides about any relevant medical conditions, recent illnesses, medications, allergies etc. that may be relevant from the outset. Pass out medical information factsheets for clients to fill out and keep with them.
- Give passengers a brief overview of the entire tour, with an emphasis on safety aspects.
- Guides assist customers with adjustment of helmets, crampons, and any other equipment.
- Guides must always choose the safest, and easiest route and avoid unnecessary exposure to high risk areas.
- Guides must ensure all clients remain in a compact group, and nobody falls behind to avoid separation.
- Guides must constantly evaluate the condition of each participant, with particular attention to onset of fatigue or hypothermia.
- River crossings should be avoided if possible.
- Tours designed to lead into more difficult terrain must start out with easy terrain for clients to familiarize themselves with the environment, and to give guides an opportunity to gauge their abilities.
- Tours onto glaciated terrain must start with an introduction to proper crampon techniques as required for the anticipated terrain.
- Frequent stops should be made to give customers time to take pictures, etc.

3.2.7 Check List – After the tour

- Check all equipment returned by clients for completeness. All items should be cleaned and in good order before putting them in storage.
- Save and archive GPS track of the tour.
- Fill out a short trip report indicating time of departure / return, route and distance taken, names of lead / assistant guide(s), number of passengers, weather, and any items of note.

3.3 Contingency Plan

A unified contingency plan has been drafted and is available in the appendix.

3.4 Incident Report

A unified incident report has been drafted and is available in the appendix.

4 Safety Plan – Alpine Trekking and High Glacier Excursions

This safety plan applies to hiking or skiing excursions on high alpine, snow covered terrain and high glaciers (such as Hvannadalshnúkur, or crossing the Vatnajökull Ice Cap).

All aspects of the safety plan and work procedures for outlet glacier hikes also apply.

4.1 Risk Assessment and Action Plan

The risk assessment can be found in table 4.1 below:

Date	**Service / product**	**Person responsible**
2024-08-20	Alpine Trekking and High Glacier Excursions	Stephan Mantler

P#	**Risk**	**Risk description**	**Control measures**	**S**	**L**	**R**
	See also tables 2.1 and 3.2, and possibly 5.1.					
3	Exhaustion	Overstrain due to difficult progress	Rules on work procedures	2	2	**4**
3	Equipment failure	Failure of critical navigation or other equipment (ski binding, etc.)	Rules on work procedures	**3**	1	**3**
3	Severe weather	Severe weather exposure	Rules on work procedures	**3**	2	**6**

TABLE 4.1: *Risk Assessment for Alpine Trekking and High Glacier Excursions. (S = Severity; L = Likelihood; R = Risk Value). Risk Values shown in **bold red** require further mitigation by action plans.*

Action Plan

For each of the risks identified above as requiring further mitigation, action plans were devised as follows:

Exhaustion. Pacing must always be adequate for client fitness level. Guides must determine and adhere to pre-defined progress and weather checkpoints during the tour, where GO / NO GO decisions must be consciously made.

Before			After		
S	L	**R**	S	L	**R**
2	2	**4**	2	1	2

Equipment failure. Critical navigation equipment must be triply redundant[13]. Guides must be able to improvise or repair any other equipment that may fail in a way that prevents progress towards shelter.

Before			After		
S	L	**R**	S	L	**R**
3	1	**3**	2	1	2

Severe weather. Precision forecasts must be used if weather systems are not favorable. Pre-defined progress and weather checkpoints during the tour where GO / NO GO decisions must be made.

Before			After		
S	L	**R**	S	L	**R**
3	2	**6**	2	1	2

4.2 Work Procedures

Ratio. The guide to customer ratio MUST be at most 8 customers to each guide for tours on well known and established routes (Sandfellsleið, ...) and at most 6 customers to each guide otherwise.

On glaciated terrain, the minimum group size SHOULD be at least three (one guide with two clients). A 1:1 guide ratio (two-person team) is possible only if crevasse conditions are known to be stable and the client has substantial prior experience.

Weather. Tours MUST be canceled if severe weather is forecast for the planned area of the tour, or if severe weather is anticipated on the way to the meeting point for the guide or clients. Severe weather for this type of tour includes but is not limited to yellow or orange weather warnings, severely limited visibility (due to wind driven snow or other effects), or sustained winds or wind gusts of more than 10 m/sec. Local effects such as wind shadows or funneling effects MUST be taken into account when making this determination.

Guides MUST set down progress and weather decision checkpoints for the chosen route, where both the group's actual progress and weather development are evaluated against the expected situation. For each such checkpoint, a suitable "abort plan" MUST be defined (either turning around, or using an alternative escape route). Any significant delays or deteriorating weather MUST lead to a NO GO decision and the group turned around. Guides have full authority on making a NO GO decision, independent of any promises made by third parties or the personal desires of the group to keep going.

In preparation, a detailed weather forecast MUST be evaluated. Multiple sources SHOULD be used whenever available, to compare the bandwidth of weather development. Commercial precision forecasts MUST be used if deteriorating conditions may occur within the maximum expected duration of the tour.

Client Profile. The minimum age for these types of tours is 15 years. Clients MUST be reasonably fit and experienced. Guides MAY at any time determine that client fitness or experience is insufficient and abort / change / cancel the tour. Clients are encouraged to fill out and carry on them a short medical fact sheet that contains information which may be relevant in emergencies (this way privacy is guaranteed, and guides will be able to access critical information if needed).

4.2.1 Mandatory Equipment

GPS and Navigation. Three, independent GPS devices MUST be carried on all tours, including a fully charged powerbank that can be used to charge at least two of the devices. One of the devices MAY be a suitable smartphone. The GPS MUST include existing maps and tracks relevant to the chosen route. A handheld compass, and if available backup paper or plasticized map, at a scale no less than 1:100.000, MUST also be carried.

Radio. A Tetra radio MUST be carried on all tours. UHF radios SHOULD be carried by the guide and the last person in the group to facilitate communication between the ends of the rope team.

Distress Signals. A signal whistle must be carried on all tours. A flare gun and red/green flares SHOULD be carried.

First Aid. An extended "mountaineering" first aid kit must be carried on all tours.

Water. Guides SHOULD carry at least 1000ml of water.

Food. Guides MUST carry one energy bar or similar emergency ration each for two clients (ie. 3 bars for 6 clients, or 4 for 8), or ensure similar rations are carried between clients additional to their planned food supplies.

Emergency Shelter. Guides MUST carry a suitable emergency shelter, or materials to improvise one.

Spare Clothing. Guides MUST carry spare wool socks, gloves, wooly hat, and a primaloft, down, or similar insulating jacket.

Dry Bag. first aid kit, emergency shelter, and spare clothing MUST be packed in a dry bag, vacuum sealed bag, or other waterproof enclosure.

Headlight. Guides MUST carry a head light and spare batteries on all tours.

Walking Sticks. Guides SHOULD carry a collapsible set of walking sticks on all tours.

Avalanche and Snow Kit. Guides MUST carry an avalanche probe and shovel on all tours. Avalanche beacons MUST be carried by all group members if the route includes sustained slopes between 25º and 60º.

Snow Anchor and Rope. Guides MUST carry a snow anchor or material to build one, and at least 30m of rope.

4.2.2 Mandatory Equipment – Glaciated Environments

In addition, for hikes crossing glaciated terrain the following equipment is also mandatory:

Harness. All clients MUST wear properly fitting harnesses.

Helmet. Guides and clients MUST wear approved helmets in areas with exposure to rock fall or other overhead or crevasse hazards.

Crampons. Guides and clients MUST carry proper mountaineering type crampons if hard snow / ice conditions are expected. If soft snow conditions are known to exist throughout the tour, guides SHOULD carry a set of spare crampons.

Ice Axe. Clients SHOULD carry walking ice axes (depending on the terrain and character of the tour, guides MAY choose to not have clients use them). Guides MUST carry an ice axe or ice climbing tool as well as a spare (axe or tool)..

Crevasse Rescue. All guides MUST carry a full crevasse rescue kit (rope, ice screws, snow anchor, and other hardware as required to build a functioning pulley system).

Spare Crampon. Guides MUST carry a spare set of crampons, including normal and extended center bars, or material to improvise all individual components of a lost or broken crampon.

4.2.3 Guides

- All guides MUST have a current Wilderness First Responder (WFR), equivalent, or better certification.
- All guides MUST have an AIMG Hard Ice 2 and AIMG Alpine Trekking 1, or better, certification.
- All guides MUST be fluent in English, or in the native language of the group they are traveling with.
- New guides MUST receive training by lead guides or other suitable staff concerning the vision, ideals and guidelines of the company, communication with guests, and group management.
- All guides MUST be aware of the Civil Protection emergency response plans and regulations, and follow them in full if necessary.
- All guides MUST practice crevasse rescue at least twice per year.
- All guides MUST practice avalanche search and rescue at least once per year.

4.2.4 Check List – Before Tour

- Passenger list and tour plan / schedule finalized
- Medical factsheets printed for each client to fill out and carry on them (has already been sent out by mail beforehand).
- Weather forecast and road conditions have been evaluated and are compatible with the tour
- Trail(s) to be taken are known to be passable. Trails on glaciated terrain were inspected no more than one week earlier.
- First aid kit in backpack is complete
- Mobile phone and Tetra radio are charged and working
- GPS device working and contains required maps / tracks
- Safety equipment is available and complete for all clients, including extra sizes.

4.2.5 Start of and during the Tour

- Introduce guide(s) by name.
- Offer passengers to approach guides about any relevant medical conditions, recent illnesses, medications, allergies etc. that may be relevant from the outset. Pass out medical information factsheets for clients to fill out and keep with them.
- Give passengers a brief overview of the entire tour, with an emphasis on safety aspects.
- Guides assist customers with adjustment of helmets, crampons, and any other equipment.
- Guides must always choose the safest, and easiest route and avoid unnecessary exposure to high risk areas.
- Guides must ensure all clients remain in a compact group, and nobody falls behind to avoid separation.
- Guides must constantly evaluate the condition of each participant, with particular attention to onset of fatigue or hypothermia.
- River crossings should be avoided if possible.
- Tours designed to lead into more difficult terrain must start out with easy terrain for clients to familiarize themselves with the environment, and to give guides an opportunity to gauge their abilities.

- Tours onto glaciated terrain must start with an introduction to proper crampon techniques as required for the anticipated terrain.
- Frequent stops should be made to give customers time to take pictures, etc. Guides should remind customers to consume food and hydrate throughout the tour.
- Progress and weather checkpoints must be observed.

4.2.6 Check List – After the tour

- Check all equipment returned by clients for completeness. All items should be cleaned and in good order before putting them in storage.
- Save and archive GPS track of the tour.
- Fill out a short trip report indicating time of departure / return, route and distance taken, names of lead / assistant guide(s), number of passengers, weather, and any items of note.

4.3 Contingency Plan

A unified contingency plan has been drafted and is available in the appendix.

4.4 Incident Report

A unified incident report has been drafted and is available in the appendix.

5 Safety Plan – Floating Ice Covers

On some winter excursions, it may be desirable to venture onto frozen lakes. This safety plan addresses the particular situation of traveling onto, or over, ice covers on significant[N] bodies of water with negligible water current, and serves as an extension to the Safety Plans of any other activities.

Frozen bodies of water with significant water flows (rivers) are specifically excluded and must not be entered.

5.1 Risk Assessment and Action Plan

The risk assessment can be found in table 5.1. Note that this only covers the specific risks of frozen bodies of water, and any other risk assessments related to the activity also apply.

Date	**Service / product**	**Person responsible**
2024-08-20	Floating Ice Covers	Stephan Mantler

P#	**Risk**	**Risk description**	**Control measures**	**S**	**L**	**R**
	See also tables 2.1, 3.2, 4.1, etc.					
4	Drowning	Fall through thin ice	Rules on work procedures.	**3**	2	**6**
4	Heat or cold	Hypothermia after going through ice	Rules on work procedures.	**3**	2	**6**
4	Nature	Ice destabilizing	Monitor weather, change plans if conditions may lead to unstable ice.	2	1	2

TABLE 5.1: *Risk Assessment for Floating Ice Covers.*
*(S = Severity; L = Likelihood; R = Risk Value). Risk Values shown in **bold red** require further mitigation by action plans.*

Action Plan

For each of the risks identified above as requiring further mitigation, action plans were devised as follows:

Fall through thin ice. Due to the potentially severe outcome of a fall through unstable ice, the main priority must be to eliminate the risk as much as possible (with suitable tour planning, ice thickness criteria, and monitoring). In addition guides must have the appropriate training and equipment to respond quickly and accurately should it occur.

Before			After		
S	L	**R**	S	L	**R**
3	2	**6**	2	2	2

Due to the dramatically higher risk of drowning if entering moving water underneath a frozen ice cover, guides are forbidden to venture onto frozen ice where significant water currents must be expected.

Hypothermia going through ice. Even a partial immersion that results in wet clothing is a high risk situation for hypothermia, especially with any potential for wind chill or prolonged exposure. Work procedures need to be in place to both minimize the risk of this occurring, replace any wet clothing if possible, isolate wet customers from wind chill, and identify shortest possible escape routes ahead of time.

Before			After		
S	L	**R**	S	L	**R**
3	2	**6**	2	1	2

[N] ie. where the water depth is sufficient to be a drowning hazard, or the location indicates that even only partially breaking through the ice cover could result in serious hypothermia or cold injury.

Ice destabilizing. Guides must ensure that throughout the duration of the tour, weather and other factors cannot lead to ice covers destabilizing and preventing the group from returning to safe ground.

Before			After		
S	L	**R**	S	L	**R**
3	2	**6**	2	1	2

5.2 Work Procedures

General Stipulations. All work on floating ice covers, tours or otherwise, MUST be performed in accordance with the best practices specified in Ice Field Safety training, the Field Guide to Working Safely on Ice Covers, the Guide for building and working safely on ice covers in Alberta, and any other relevant courses and publications.

Tour Planning. The safety of the ice MUST be assessed prior to the tour, with primary and alternate routes over or around the ice identified. This assessment MUST take into account aspects such as water flow into / out of the area, exposure to solar radiation, possible effects of changes in water level, wind loading, etc. The thickness of the ice MUST be measured at regular intervals along the routes.

Documentation. Any floating ice covers to be used for tours MUST be documented in a way that tracks changes in ice thickness and consistency over time. For each measured location, the documentation SHOULD include its position, ice thickness, subjective evaluation of ice consistency, and water depth.

Ice Thickness Criteria. The absolute minimum effective thickness[14] of ice for guides to venture onto floating ice cover in the scope of checking conditions for future tours is 10cm. If ice thinner than 10cm is expected, guides MUST take additional safety precautions such as working in pairs, wearing a PFD, and/or using other safety equipment. The minimum thickness to bring customers onto floating ice cover is 20cm.[15]

Ratio. The guide to customer ratio MUST be at most 10 customers to each guide for floating ice covers with a thickness of more than 40cm in all measured locations, or 6:1 if between 20 and 40cm.

Weather. Tours MUST be canceled / adjusted if significant precipitation (rain) is forecast that may affect water levels underneath the ice cover, or if any other weather patterns must be expected that may have an impact on the safety of the tour.

Partial Immersion. Should a customer break through water (even if only partially), and suffer wet clothing or boots in sub-freezing temperatures, guides MUST immediately attempt to replace the wet items with dry clothing if safely possible, and take the shortest posible path back to the vehicle or shelter.

5.2.1 Mandatory Equipment

This Mandatory Equipment list is in addition to any other required equipment for the overall tour:

Self Rescue. Guides MUST carry ice picks or other suitable tools, readily available for self rescue.

Throw Bag. Guides MUST carry a 10m or longer length of rope suitable for throwing to customers who have gone through the ice, ideally in a throw bag configuration. This rope MUST be of a material and construction that allows it to float on water.

Ice Screw. Guides MUST carry at least one 20cm ice screw for anchoring and ice thickness inspection.

Hiking or Wading Pole. Guides MUST carry a hiking pole, wading pole, or similar tool suitable for probing water depth and reach extension.

Microspikes. All participants MUST be equipped with microspikes.

Spare Clothing. Guides MUST carry a set of spare clothing, consisting of at least the following items:

- Fleece pants
- Fleece upper
- Wool socks
- Wool hat
- Gloves or mittens
- Two plastic bags[O]
- Microfiber towel

These MUST be packed in a suitable fashion, such as waterproof bags or vacuum packed.

5.2.2 Guides

- All guides MUST have a current Wilderness First Responder (WFR), equivalent, or better certification.
- All guides MUST have an AIMG Hard Ice 2, equivalent, or better qualification.
- All guides MUST have an Ice Field Safety[P], equivalent, or better qualification.
- All guides MUST be fluent in English, or in the native language of the group they are traveling with.
- New guides MUST receive training by lead guides or other suitable staff concerning the vision, ideals and guidelines of the company, communication with guests, and group management.
- All guides MUST be aware of the Civil Protection emergency response plans and regulations, and follow them in full in case of natural disasters and other emergencies.
- All guides MUST practice ice field rescue at least once, early in the winter.

5.2.3 Check List – Before Tour

- Passenger list and tour plan / schedule finalized
- Medical factsheets printed for each client to fill out and carry on them (has already been sent out by mail beforehand).
- Weather forecast and road conditions have been evaluated and are compatible with the tour
- Main and alternate routes / exit points have been identified

[O] The purpose of the plastic bags is to provide a waterproof barrier between the wool socks and wet shoes.
[P] www.rescue3europe.com/courses/ice-field-safety-ifs/

- Ice cover has been tested to be of sufficient thickness along the full route to be taken as well as for any alternate routes
- First aid kit in backpack is complete
- Mobile phone and Tetra radio are charged and working
- GPS device working and contains required maps / tracks
- Safety equipment is available and complete for all clients, including extra sizes.

5.2.4 Start of and during the Tour

- Introduce guide(s) by name.
- Offer passengers to approach guides about any relevant medical conditions, recent illnesses, medications, allergies etc. that may be relevant from the outset. Pass out medical information factsheets for clients to fill out and keep with them.
- Give passengers a brief overview of the entire tour, with an emphasis on safety aspects.
- Guides assist customers with selection and adjustment of any provided equipment.
- Guides must always choose the safest, and easiest route and avoid unnecessary exposure to high risk areas.
- Before entering floating ice cover, guides explain to customers how to safely move over ice, how to react if the ice becomes unstable and in particular how to react to any emergency such as the guide or themselves breaking through ice.
- Guides must re-check ice thickness during each tour, especially in areas where thinner ice must be expected (near water flows, shoreline, etc).

5.2.5 Check List – After the tour

- Check all equipment returned by clients for completeness. All items should be cleaned and in good order before putting them in storage.
- Save and archive GPS track of the tour.
- Fill out a short trip report indicating time of departure / return, route and distance taken, names of lead / assistant guide(s), number of passengers, weather, and any items of note.

5.3 Contingency Plan

A unified contingency plan has been drafted and is available in the appendix.

5.4 Incident Report

A unified incident report has been drafted and is available in the appendix.

6 Safety Plan – Ice Caves

This safety plan applies to excursions into ice caves and other, similar subglacial spaces. As such, it is an extension of the Safety Plan for mountain / glacier hikes. It does not apply to ice caves formed by geothermal processes, but only for ice caves where the mechanism is either subglacial meltwater, or it is a randkluft formation (glacial separation from the surrounding rock face). The safety plan is also applicable to tours accessing ice tunnels, crevasses, moulins, and any other structures that are comparable in character.

Ice caves are generally a winter activity, when overall conditions and change process are more suitable for entering them. However, since structures with comparable character may be accessible throughout the year, this safety plan applies to all such locations independent of the seasons. Particular care must be taken to observe rapid change processes throughout the summer months (see also section 3.2.1).

6.1 Risk Assessment and Action Plan

The risk assessment can be found in table 6.1. Note that the risk assessments for general activities and superjeep tours, as well as for mountain / glacier hikes, also apply.

Date	**Service / product**	**Person responsible**
2024-08-20	Ice Caves	Stephan Mantler

P#	**Risk**	**Risk description**	**Control measures**	**S**	**L**	**R**
	See also tables 2.1, 3.2 and possibly 5.1.					
4	Blow	Blow from falling material	Rules on work procedures. Clients must avoid exposed areas.	**3**	2	**6**
4	Hazardous Mat.	Toxic fumes	Geothermal ice caves are forbidden	**3**	2	**6**
4	Drowning	Fall into glacial river	Rules on work procedures.	**3**	1	**3**
4	Blow	Head struck against low ceiling	Helmets worn at all times; people reminded of low ceiling upon entering cave	1	1	1
4	Heat or cold	Stepped into wet snow / water in cave	Advise people to avoid unstable areas in cave, evaluate changing water levels.	1	1	1
4	Nature	Rising water levels in cave	Monitor weather, cancel / reschedule if risk of rising water levels present.	1	1	1

TABLE 6.1: *Risk Assessment for Ice Caves.*
(S = Severity; L = Likelihood; R = Risk Value). Risk Values shown in ***bold red*** *require further mitigation by action plans.*

Action Plan

For each of the risks identified above as requiring further mitigation, action plans were devised as follows:

Blow from falling material. Guides must continually evaluate ceiling area before entering and during visit. Unstable roof areas must be avoided or removed in a controlled fashion. Clients must wear helmets whenever exposed to any overhead risks.

Before			After		
S	L	**R**	S	L	**R**
3	2	**6**	2	1	2

Fall into glacial river. Evaluate safety of ice cave visit in conditions that may result in unsafe water levels; avoid exposure to areas where clients could fall into water. Pay particular attention to downstream risks.

Before			After		
S	L	**R**	S	L	**R**
3	1	3	2	1	2

Toxic fumes. Ice caves formed through, or nearby, geothermal processes MUST NOT be entered. Care must be taken to monitor air quality in confined, poorly ventilated spaces[16].

Before			After		
S	L	**R**	S	L	**R**
3	2	6	2	0	0

6.2 Work Procedures

Site-Specific Risk Assessments. Guides MUST actively participate in updating shared information on site-specific risk assessments on GLACIS. Those updates MUST be made after each tour.

Guides MUST also check available information on the shared platform prior to each visit.

Ratio. The guide to customer ratio MUST be at most 10 customers to each guide for ice caves where the inside of the cave provides a simple and straightforward environment, or 6:1 in more complicated scenarios.[17]

Weather. Tours MUST be canceled if severe weather is forecast for the planned area of the tour, or if severe weather is anticipated on the way to the meeting point for the guide or clients. Severe weather includes but is not limited to yellow or orange weather warnings, severely limited visibility (due to wind driven snow or other effects), or sustained winds or wind gusts of more than 15 m/sec. Local effects such as wind shadows or funneling effects MUST be taken into account when making this determination.

Client Profile. There is no absolute upper or lower age limit for shorter ice cave tours, as long as suitable safety gear is available and children are able to follow instructions. Guides MUST keep the tour duration and difficulty level as flexible as possible, and plan for a fast and easy return if necessary.

Clients with physical or mental special needs are welcome and MUST be accommodated if it is safely possible. Clients are encouraged to fill out and carry on them a short medical fact sheet that contains information which may be relevant in emergencies (this way privacy is guaranteed, and guides will be able to access critical information if needed).

For day tours, the minimum age is 10 years.

6.2.1 Mandatory Equipment

The Mandatory Equipment list for low land hikes apply here as well, with the following additions / changes:

Headlight. All clients SHOULD be equipped with headlights. Guide MUST carry a personal head light, plus one additional spare head light and spare batteries on all tours.

Microspikes. All clients MUST be equipped with microspikes if slippery conditions (hard compacted snow, soft surface ice) exist. If the tour leads over glacier ice, full glacier equipment MUST be used (crampons, harnesses, etc.).

6.2.2 Guides

- All guides MUST have a current Wilderness First Responder (WFR), equivalent, or better certification.
- All guides MUST have an AIMG Ice Cave 1 and AIMG Hard Ice 2, equivalent, or better qualification.
- All guides MUST be fluent in English, or in the native language of the group they are traveling with.
- New guides MUST receive training by lead guides or other suitable staff concerning the vision, ideals and guidelines of the company, communication with guests, and group management.
- All guides MUST be aware of the Civil Protection emergency response plans and regulations, and follow them in full in case of natural disasters and other emergencies.
- All guides MUST practice crevasse rescue at least twice per year.

6.2.3 Check List – Before Tour

- Passenger list and tour plan / schedule finalized
- Medical factsheets printed for each client to fill out and carry on them (has already been sent out by mail beforehand).
- Weather forecast and road conditions have been evaluated and are compatible with the tour
- Trail(s) to be taken are known to be passable. Trails on glaciated terrain were inspected no more than one week earlier. Ice caves are known to be in safe condition.
- First aid kit in backpack is complete
- Mobile phone and Tetra radio are charged and working
- GPS device working and contains required maps / tracks
- Safety equipment is available and complete for all clients, including extra sizes.

6.2.4 Start of and during the Tour

- Introduce guide(s) by name.
- Offer passengers to approach guides about any relevant medical conditions, recent illnesses, medications, allergies etc. that may be relevant from the outset. Pass out medical information factsheets for clients to fill out and keep with them.
- Give passengers a brief overview of the entire tour, with an emphasis on safety aspects.
- Guides assist customers with adjustment of helmets, crampons, and any other equipment.
- Guides must always choose the safest, and easiest route and avoid unnecessary exposure to high risk areas.
- River crossings should be avoided if possible.
- Tours designed to lead into more difficult terrain must start out with easy terrain for clients to familiarize themselves with the environment, and to give guides an opportunity to gauge their abilities.
- Tours onto glaciated terrain must start with an introduction to proper crampon techniques as required for the anticipated terrain.
- Upon arrival but before entering the ice cave, guides reiterate all relevant safety aspects:
- Avoid sections of thin roof (in particular at the entrance and around openings)
- Be vigilant about suspended material in the ceiling, on shelves, etc.
- Watch for water / wet spots on the ground
- Helmets must remain on heads at all times; careful about low ceilings
- Clearly designate unsafe areas (use ropes, an ice axe, or other markers)
- Guides must constantly monitor the ice cave for possible safety concerns.

- Guides must constantly evaluate client conditions for signs of fatigue, hypothermia, or other discomfort.
- Frequent stops should be made to give customers time to take pictures, etc.
- Vaping / smoking and food consumption are not allowed inside ice caves.

6.2.5 Check List – After the tour

- Check all equipment returned by clients for completeness. All items should be cleaned and in good order before putting them in storage.
- Save and archive GPS track of the tour.
- Fill out a short trip report indicating time of departure / return, route and distance taken, names of lead / assistant guide(s), number of passengers, weather, and any items of note.

6.3 Contingency Plan

A unified contingency plan has been drafted and is available in the appendix.

6.4 Incident Report

A unified incident report has been drafted and is available in the appendix.

7 Appendix

The attached Quick Fact Sheet can be sent to customers to give them a good overview of the upcoming activity. The same information can also be conveyed by other means (often most of this is already communicated in our emails prior to booking).

The Contingency Plan serves as guidance in case something does go wrong, and provides the necessary structure to handling such a situation.

The Incident Report must be used to document any incidents of note, including "near misses" and those observed from other tours / groups.

The Trip Sheet records essential information about each tour and is valuable to gain insights on average tour durations, equipment use, etc.

7.1 Quick Fact Sheet

Thank you for booking your tour with us! To ensure an enjoyable and safe experience, we have collected a few suggestions that we hope you will find helpful. If you have any questions, comments or suggestions, please do not hesitate to be in touch.

What to Expect

Our tours generally start either at your accommodation or at another previously arranged meeting point. We will have been in contact beforehand, discussing the weather conditions and the resulting options for our tour. After a brief introduction and going over some last-minute details, there is almost always a superjeep drive – sometimes short, sometimes long, often bumpy – that will get us to the trail head.

Here we will go over any additional items we will need (depending on the activity, this may include crampons, ice axes, and a full set glacier safety gear, or just whatever you choose to bring if it's an easy hike). If any of the equipment is unfamiliar to you, we will include a short introduction to useful basic techniques. We generally "ease into" the terrain, beginning with a warm up to familiarize ourselves with the environment and gear, and then gradually exploring more adventurous terrain. Throughout the tour we'll make frequent stops to take pictures, point out things of interest, and generally get a "feel" for the environment we are passing through. There is typically at least one longer stop where we rest for a while, have a snack and get a good look around. Thanks to the flexibility of being on a private tour, any stops and routes we are taking are merely suggestions based on our experience and knowledge of the area. We will try very hard to accommodate any change of plans that may present itself during the day.

Clothing

Venturing onto the glacier is almost always a chilly experience, and good outdoor clothing can make all the difference. Unfortunately, we do not have clothing or footwear for rent, which is why it is particularly important to come with the right gear. As a general rule of thumb, dressing one season 'colder' than you would expect will put you in a good ballpark.

We recommend thermal underwear and a good, windproof outer layer (mountaineering / hiking pants). Leggings or jeans are not a sensible choice. On the upper body, three layers are usually the best choice. Good gloves and a beanie or buff (fits under the helmet) complete a functional outfit. If the weather forecast is anything but perfect, a good waterproof outer shell can make the difference between an adventurous day and a miserable one.

For activities that venture onto the glacier, stable and secure hiking footwear is required. Low cut shoes that do not cover the ankle and "slip-on" boots (without laces) are a safety hazard and not acceptable. "Crampon compatible" mountaineering boots can be an advantage but are not strictly necessary except for ice climbing activities.

For longer tours where we might be taking extended breaks (for example, a longer hike to an ice cave) we strongly recommend bringing an extra warm jacket to wear only when resting to avoid getting cold.

What to Bring

The following checklist is a suggestion only and not all items are relevant on all tours, but it may help you identify valuable items that could have been missed.

- ☐ Waterproof outer shell
- ☐ Buff or scarf
- ☐ Extra fleece or down jacket
- ☐ Camera
- ☐ Water or other (500ml)
- ☐ Sunglasses / Ski goggles
- ☐ Thin and/or thick gloves
- ☐ Food / snacks
- ☐ Beanie or wooly hat
- ☐ Walking sticks
- ☐ Tissues
- ☐ Extra pair of socks
- ☐ Comfortable backpack
- ☐ Sunscreen (summer)
- ☐ Medical factsheet (see below)
- ☐ Solid footwear (no sneakers / dress shoes / designer boots)

Additional items that are particularly useful for Ice Cave tours, northern lights and similar activities:

- ☐ Tripod (ideally with spikes)
- ☐ Lens cloth or similar
- ☐ Extra batteries for camera
- ☐ Pen- or Headlight (ideally with low-intensity red LED light)
- ☐ Thermos / hot beverage
- ☐ Rain cover for camera (a small plastic bag works well too)

Medical Considerations

Our adventure will lead us into the Icelandic wilderness, and by booking this tour you confirm that you are generally healthy and physically fit for the chosen activity. Your safety and wellbeing is our highest priority, and we strongly recommend you notify us of any relevant medical conditions. This will ensure that our guides can design the tour accordingly, and that they can respond quickly and accurately in the unlikely event of a medical emergency. Please consider filling out the following fact sheet and carrying it on your tour.

Name: Year of Birth:

Nationality: Emergency Contact (name & phone):

Blood type: _____

Please check all that apply:

☐ Diabetes ☐ Asthma

☐ High blood pressure ☐ Epilepsy

☐ Hemophilia Pregnant (____ weeks at time of tour)

☐ I carry an Epipen

Allergies to ☐ food | ☐ pollens | ☐ latex | ☐ stinging insects | ☐ medications

- if food or medications, please specify: _____

Current medications (please mark any you need to take regularly):

_____

Recent illnesses or relevant injuries:

_____

7.2 Contingency Plan

his contingency plan serves as a outline for all major incidents, to guarantee all required actions are taken. Guides will need to adjust the order of steps according to the situation at hand, to ensure the best possible result for all people involved.

A **major incident** is any incident in which a person suffers an injury or medical emergency requiring evacuation or medical treatment, or any other incident that significantly alters the nature and timing of the tour (vehicle breakdown, natural disaster, etc.). Háfjall ehf. is a small company generally with no superiors to be informed, but this step is deliberately kept in the plan for guides to consider if any business partners or other stakeholders may need to be informed (for example, if a tour was organized through a third party).

Assess situation and ensure safety for all clients, guide, and others

Person(s) injured	**No injuries**
↓	↓
Call 112 using phone or TETRA, or activate PLB emergency signal	Attend to clients and bystanders as necessary
↓	↓
Provide location and details of injury	Perform recovery / repair / ... as required
↓	↓
Administer first aid	Inform superiors / management
↓	↓
Attend to possible hypothermia of patient and others	Evaluate options for continuation or modification of the ongoing tour
↓	↓
Prepare for arrival of rescue team	Compile incident report
↓	
Attend to patient, other clients, and bystanders	
↓	
Once injured person(s) are with rescue team, take secondary measures	
↓	
Inform superiors / management	
↓	
Inform family / ICE contacts of injured persons	
↓	
Attend to other clients and bystanders as necessary	
↓	
Compile incident report	
↓	
Submit incident report to authorities	

7.3 Incident Report

The incident report is included on the following separate pages to be printed out easily as separate sheets.

Atvikaskýrsla

1. Almennar upplýsingar

Alvarleiki atviks: Slys_____ "Næstum því" slys_____ Annað:_____

Tímasetning atviks:_____ Skráð af:_____ Stjórnandi ferðar:_____ Nafn ferðar:_____

Staðsetning atviks:_____ GPS hnit: N_____ og V_____

Lýsing á atviki:

_____

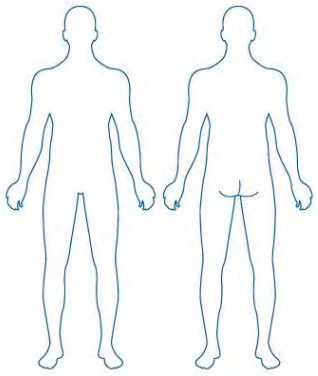
Til hvaða aðgerða greip stjórnandi:

2. Persónulegar upplýsingar athugið að nota skal eitt eyðublað á hvern einstakling

Nafn farþega:_____ Sími:_____ Netfang:_____

Lýsing á áverka:

Merkið inn á teikninguna staðsetningu á áverkum



Var viðkomandi fluttur á sjúkrahús. Já_____ Nei_____ Hafnað af viðskiptavini_____

Fluttur með sjúkrabíl. Já_____ Nei_____ Fluttur hvernig_____

Lögregla kölluð til. Já_____ Nei_____

Aðrir viðbragðsaðilar, hverjir:

3. Farþegar

Þurftu aðrir farþegar á áfallahjálp að halda? Já_____ Nei_____

Var áfallahjálp boðin fram? Já_____ Nei_____ Farþegar afþökkuðu _____

Aðrar ráðstafanir gerðar varðandi farþega:

Sjónarvottar að atviki:

Nafn:_____ Sími:_____ Netfang:_____ Þjóðerni:_____

Nafn:_____ Sími:_____ Netfang:_____ Þjóðerni:_____

Nafn:_____ Sími:_____ Netfang:_____ Þjóðerni:_____

Nafn:_____ Sími:_____ Netfang:_____ Þjóðerni:_____

4. Stjórnun

Stjórnanda fyrirtækis tilkynnt? Hverjum?_____

Tímasetning tilkynningar_____

Tryggingarfélagi tilkynnt um atvikið? Já_____ Nei_____

Annað sem þarf að koma fram:

_____ _____

Undirskrift þess er skýrslu ritaði

Undirskrift stjórnanda ferðar ef annar

Aðgerðir sem gripið var til í framhaldi af atviki ef einhverjar:

7.4 Trip Sheet

Tour:		
Date:	Start Time:	End Time:
Lead & assistant Guide(s):		
Location / Route:		
Vehicle Used:	km Start:	km End:

(if more than one, list others under general remarks)

No. clients:

Weather:

General remarks:

(gear used, notes on conditions, etc.)

7.5 Inspection Plan

This inspection plan is intended as a guideline for inspection of items used throughout our tours.

All items used during tours must be cleaned and checked for damage before being put back into storage, but this plan ensures all items – even if used rarely – are inspected at adequate intervals.

For each item, the manufacturer recommended inspection procedures apply and should be referred to (for example, to determine acceptable vs. unacceptable wear on a carabiner). The maximum age column shows typical manufacturer specifications and serves as a reference only.

Overall, customer soft goods such as harnesses are typically not as heavily used and may show little physical wear, but will be subject to UV degradation. This must be taken into account when determining its acceptable lifetime.

Item(s)	**Freq.**	**Particular Inspection Points**	**Max. Age**
VHF, UHF, TETRA radios; GPS/SAT tracking devices; avalanche transceivers	Yearly	Function (send and receive calls, no sticky buttons, send and receive messages). Battery lifetime and charge are nominal.	n/a
Harnesses	Yearly	Check for visual damage and wear (especially tie-in point and size adjusters), and age	5 years
Crampons	Yearly	Inspect size adjustment function, center bar for bending / damage, spike sharpness, strap for fraying	n/a
Microspikes	Yearly	Check for damage in rubber (tearing), wear on metal parts	n/a
Ice Axes, Walking Sticks	Yearly	Check for overall damage, walking stick size adjustment works	n/a
Helmets	Yearly	Overall damage and wear, size adjusters work as designed, age	10 years
Climbing soft goods (Ropes, slings, cords, etc.)	Monthly	Mantle wear, core shape (no flat or stiff parts), ends fraying, end labels are present and correct (length marked), age	5 years
Climbing hardware (metal - carabiners, ...)	Yearly	Wear, damage, corrosion, proper function (carabiner gates open / close / lock as intended, etc.)	n/a
Vehicle Tire Inflation Systems	Yearly	Check overall system for air leaks (especially rotary connectors), air compressor performance.	n/a
Vehicle Tool Kit	Yearly	Check for completeness and overall wear	n/a
Head lamps	Yearly	Function check, battery charge level	n/a
Puncture Repair Kits	Yearly	Check for completeness	n/a
Vehicles	Yearly	Presence of all required documentation and function of any auxiliary equipment installed (pneumatic steps, PA system, ...)	n/a
GPS	Yearly	Function, battery lifetime and charging, map updates, routes and other data up to date	n/a
First Aid kits	Monthly	Completeness, expiry dates of individual items	3 years
Emergency Shelters	Yearly	Check for visible damage / wear	n/a
Dry Bags	Yearly	Ensure they are waterproof (easy to miss small punctures)	n/a
Avalanche / Snow Kit	Yearly	Check for completeness, wear & damage	n/a

7.6 Glacier Access Routes

It is important to note that glacier extents have changed substantially compared to what is displayed on available maps. All routes are approximate and serve as examples only, but are based on first hand experience and GPS tracks. Conditions are subject to change at any time and accessibility and routes must be evaluated on a day-by-day basis.

Unbroken lines are established vehicle routes (usually drivable by vehicles with 35" tires or larger); dashed lines are access hikes.

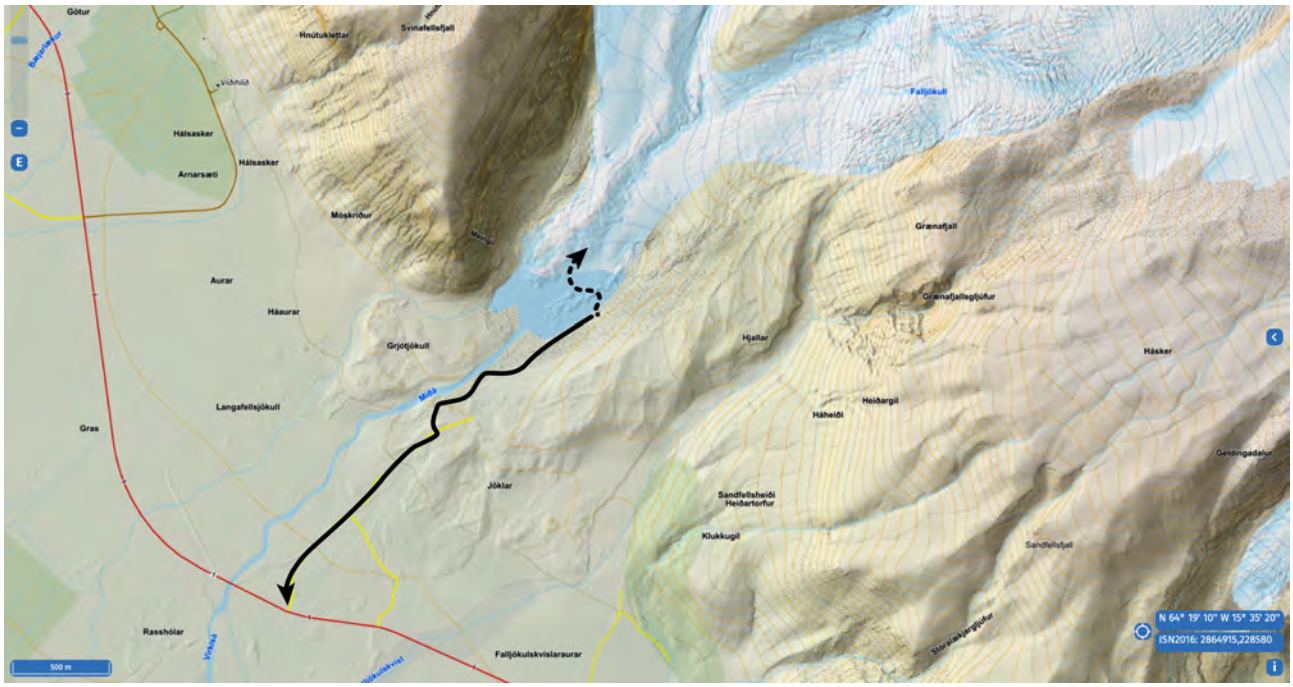


FIGURE 7.1: *Falljökull*

FIGURE 7.2: *Breiðamerkurjökull (West)*

FIGURE 7.3: *Breiðamerkurjökull (East)*

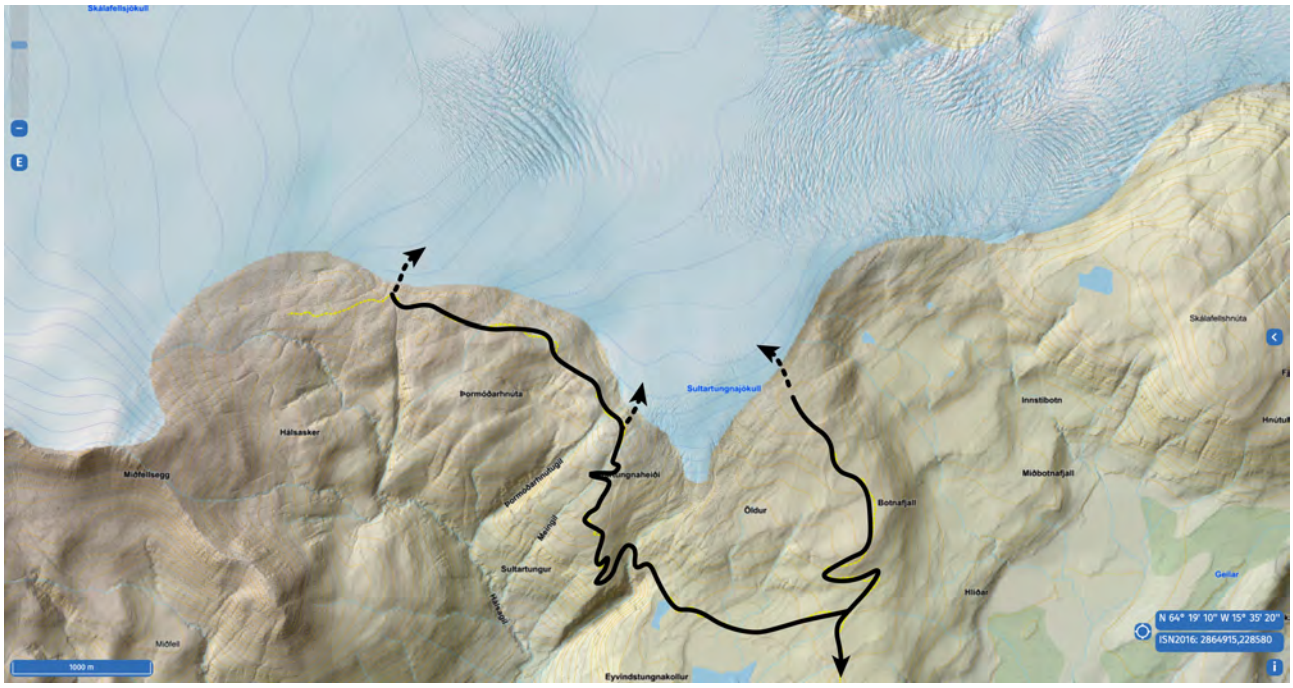


FIGURE 7.4: *Skálafellsjökull*

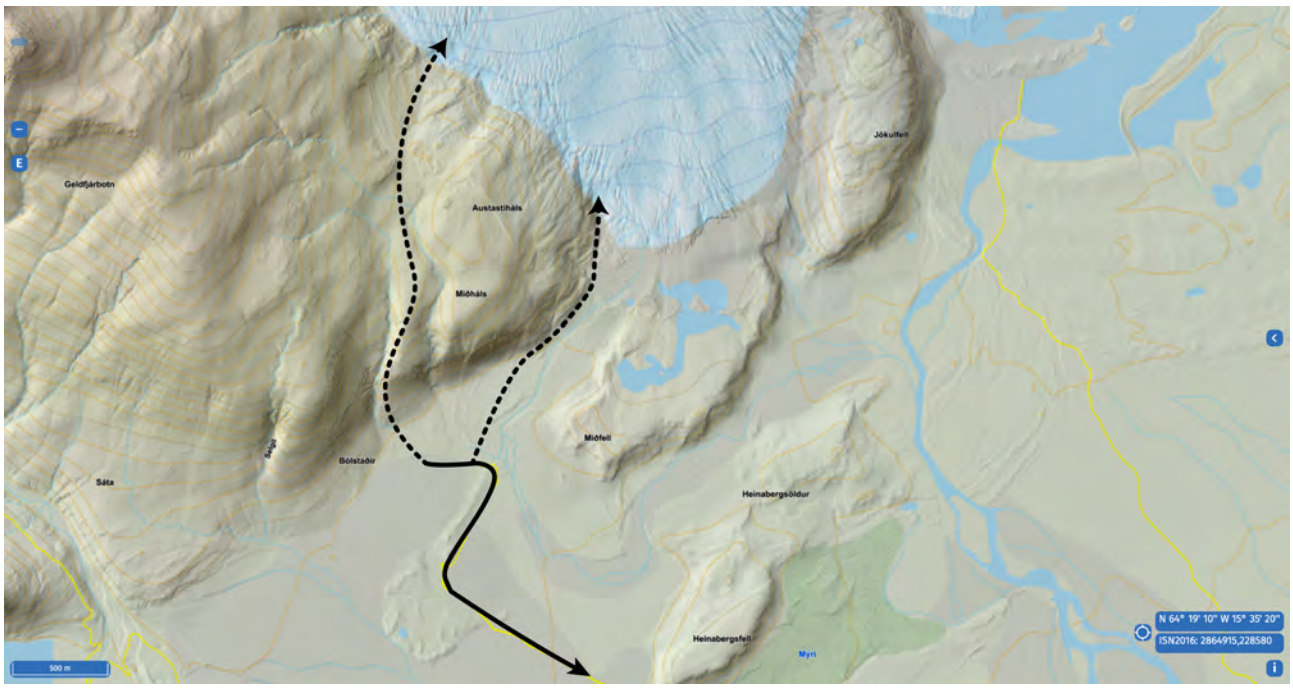


FIGURE 7.5: *Fláajökull (West)*

Notes

1. One of the main reasons is that this also makes it now possible to easily annotate the text with comments like this without disturbing the reading flow and essential content.

2. Feedback requested clarification on points 1.1, 1.4, 2.1 and 2.7 of this document.
   Point 1.1 was addressed in a new paragraph of the safety plan (see section 3), and by including more detailed Work Procedures in section 3.2.
   Point 1.4 was addressed with an additional paragraph 3.0.0.1, table 3.1, and section 7.6.
   Point 2.1 was added to Work Procedures for the various tours (see paragraphs 2.2.0.3, 3.2.0.3, 4.2.0.3, and 6.2.0.4).
   Point 2.7 was added to the general Work Procedures (see paragraphs 2.2.0.2, 3.2.0.2, 4.2.0.2, and 6.2.0.3)

3. The access route is now drivable for a substantially longer distance. One water crossing may cause issues in the winter months due to substantial slush and ice buildup, at least for smaller vehicles.

4. Although this particular accident occurred in an ice cave tour, the same risks also apply to any other glacier hike where one might be exposed to overhead hazards. It is therefore included in section 3, which encompasses all activities related to hard ice (outlet glaciers), independent of the particular activity or time of year. One aspect that may change between seasons is the mechanism which may cause hazards to become more of a concern; in summer it is primarily the weathering crust and water intrusion, while in winter rapid temperature swings and the resulting thermal stresses can produce similar results. However, Icelandic winters are inconsistent in temperature and warm weather spells with rainfall or snow/ice melt episodes must be expected throughout the year.

5. This brings the safety plan into accordance with an email the Vatnajökull National Park sent out earlier today

6. In this context, reliability also includes punctuality, providing the services agreed upon to the best possible extent, keeping them informed about possible changes, and generally operating in a way that is predictable for the customer.

7. These meanings derive from the well known best practices for Internet Standards, published as RFC 2119.

8. It should be noted that risk assessments are a very variable measure, and depend upon how much of the work procedures and common best practices is already taken into account. Thus, different companies may evaluate the same situation with rather different risk factors simply based on their guiding culture, main client market, and overall tour environment.

9. This specifically refers to GLACIS, the shared website now being in use to track the development and safety of ice caves within the Vatnajökull National Park, but it is both conceivable and desirable that this concept will expand to other areas and activities.

10. We also went ahead and organized a Rescue3 Instructor to come and hold two Ice Field Safety courses for interested guides in the area this past January, which was quite successful and was met with considerable interest from the guide community as well. These courses will most likely be repeated in the coming fall.

11. For example, fall from height due to rope misuse is always a risk, irrespective of whether it was ice climbing, performing a guided rappel, or clipping into a fixed rope as part of fall protection during a normal glacier hike.

12. This method relies on the guide having considerable experience and being able to react quickly and assist a stumbling client before they begin to slide downwards, and is therefore only useful if the group can be kept very closely together and the guide has sufficient experience to anticipate and quickly react to such incidents.

13. This may sound excessive, but is easily achieved in practice. A phone, a GPS watch, and a dedicated GPS device all count as fully capable GPS navigation devices and are all routinely carried on tours of any duration. In addition, the GPS system of TETRA radios also allows for location fixing and basic navigation. In combination with a compass and paper maps, a competent guide has five mutually independent means of navigation.

14. Section 4.1.2 in the Guide for Building and Working Safely on Ice Covers in Alberta defines Effective Ice Thickness as the good quality, well-bonded white and blue ice that is measured in an ice cover. Poor quality or poorly bonded ice must not be included in the measurement of ice thickness. The following are examples of ice that must be excluded from the measurements if they are encountered:

    - Ice layer with water lens (>5 mm diameter) with a cumulative volume greater than 10% of the total volume.
    - Ice layer with visible incompletely frozen (slush) ice.
    - Ice layer that is poorly bonded to the adjoining layer.
    - Ice layer that is decaying (thinning) due to warming or solar radiation

- Ice that has wet cracks.

15. While the best practices and field guide published by the Government of Alberta specify a minimum thickness of 10cm to be sufficiently safe to walk out onto ice, we find that for commercial operations and to account for the inevitable variability of the ice both in thickness and quality, a 20cm minimum effective thickness is advised. See for example Sections 4.1 and Table 5 in the Guide for Building and Working Safely on Ice Covers in Alberta for details.

16. There was at least one ice cave - the Crystal Ice Cave in Breiðamerkurjökull in about 2016 - where an inner chamber was only accessible through a low entryway. This space was known for having noticeably poor air quality in the afternoons, after numerous visitors had come through the cave throughout the day.

17. In this context, "simple and straightforward environment" means a hike of up to 1 hour on a well defined trail without the need for sustained "spotting" of individual clients. A "more complicate scenario" includes glacier travel, or rope use (such as clipping into fixed lines / "via ferrata") and other modes of travel where clients may require individual assistance by the guide.