



**MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE AVALANCHE PROGRAMS**

**BACKCOUNTRY AVALANCHE RISK ASSESSMENT PROTOCOL**

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# **Ministry of Transportation and Infrastructure Avalanche Programs**

## **Backcountry Avalanche Risk Assessment Protocol**

### **1.0 Introduction**

The rising popularity of winter recreational activities has resulted with an increase in backcountry winter rescue call outs. Ministry of Transportation and Infrastructure, (MoTI), Avalanche and Weather Programs (AWP) staff have been contacted by various authorities (Emergency Management British Columbia, RCMP, BC Coroner) to assist in backcountry winter rescue/recoveries and to conduct avalanche risk assessments in those efforts.

With the increasing frequency of these requests it has become necessary to define conditions for MoTI AWP staff to participate in these types of events. It is necessary to define levels of responsibilities between MoTI, EMBC, RCMP and the BC Coroners Service. This document identifies the conditions for MoTI involvement and the responsibilities with those agencies.

This document follows the British Columbia Emergency Management System's (EMBC) Incident Command System and ISO 31000 Risk Management practices.

### **2.0 Conditions of MoTI Involvement**

If Ministry AWP staff receives a request to become involved in a backcountry winter rescue, the first consideration must be whether or not their absence will adversely affect avalanche safety to their highway segments.

Every backcountry winter rescue will have unique considerations, including rescue teams access to and from the rescue site. The winter rescue is not the responsibility of the AWP staff. It will be up to the discretion of the Avalanche Technician to ensure the rescue efforts are congruent with their professional and personal risk criteria, or defer a response to the Canada Avalanche Association professional membership resource list.

If the Ministry AWP staff accept this task, they will act in accordance to the Canadian Avalanche Association's Standards of Conduct working within their Scope of Practice following the EMBC Incident Command System as:

- Avalanche Safety Officer under ICS Command Staff
- Strike Team Leader under ICS Operations Section
- Task Force Leader under ICS Operations Section

Depending on circumstances of the rescue or recovery, involved participants may also be called upon to give statements and/or be a witness in criminal or social legal proceedings. The BC Coroner may request MOTI AWP to assist with a site investigation.

### **3.0 Avalanche Risk Assessment Protocol**

If a member of the MoTI AWP accepts responsibility to participate in a backcountry winter rescue effort, their roles may include one or more of the following duties:

- Avalanche Safety Officer will identify the avalanche hazard, assess the avalanche risks, delineate safety and avalanche risk zones, and offer treatments to reduce threats during the entire rescue mission
- Strike Team Leader will strive to reduce the avalanche risk to rescuers using helicopter deployment of explosives following the WorkSafeBC approved MOTI Explosives Use Operational Plan found in the MOTI Avalanche Safety Plan, (appendix X)
- Task Force Leader will instruct agencies in safe, effective and efficient search and rescue techniques

The Avalanche Safety Officer will utilize the EMBC Active Avalanche Safety Program ICS 305-A form and the Canadian Avalanche Association, Avalanche Incident Report form found in the appendix of this document.

An EMBC task number must be confirmed prior to MOTI involvement in a backcountry winter rescue effort. The task number confirms that participants involved in the rescue are covered by the Emergency Program Act and liability provisions. The ASE number is necessary if any aircraft are used for the rescue effort. If necessary call the Emergency Management British Columbia phone number for these assigned numbers:

- 888.344.5888 (agency use only)
- 800.663.3456 (24 hour -7 days/week)

Expenses incurred by the AWP through the involvement of Ministry staff and resources will be reimbursed by EMBC, referencing the task number assigned to the rescue effort.

Incidents involving fatalities may escalate to supervision by the BC Coroner Service. MOTI AWP staff involved in these rescue may be requested to write a formal report of their observations and involvement.

## **4.0 Responsibilities**

Responsibilities of agencies likely to become involved in a backcountry winter rescue include the following:

### **4.1 RCMP**

- Is the agency responsible for the overall coordination of the rescue effort
- Likely to be the first agency to receive request for assistance
- Contacts EMBC with preliminary incident particulars
- Contacts BC Coroners Service if fatalities involved and may be authorized by the coroner to take charge of the avalanche scene.

### **4.2 BC Coroners Service**

- Investigates all unnatural and unexpected deaths, including avalanche-related deaths and other accidental deaths
- Has jurisdiction over the human remains. The coroner has to provide authorization before the body can be moved/transported
- Has jurisdiction over the avalanche scene where a death occurred. The coroner may authorize the police to take charge of the avalanche scene
- May request involvement from Ministry Avalanche staff, to act as technical experts in assessing scene safety, analyzing avalanche /snowpack related information and in some cases preparing an incident investigation report.

### **4.3 EMBC**

- Provide and/or coordinate resources in support to responsible agency
- Confirm Avalanche Safety Officer has Canadian Avalanche Association, Avalanche Operations Level II
- Request assistance from Ministry Avalanche and Weather Programs, or other appropriate agencies
- Issues Task and ASE numbers, as appropriate
- Reports fatalities to Coroner/RCMP via the SAR team on site
- Reimburse authorized cost of the rescue.

### **4.4 MOTI**

- Ensures EMBC task and ASE numbers are assigned with initial request to assist in rescue
- To provide an avalanche risk assessment in order to ensure safety for all participants and patients during rescue efforts
- To provide technical avalanche expertise of rescue equipment and search techniques to locate victims
- To provide avalanche risk reduction through explosives control if necessary.

## **5.0 Insurance and Financial Coverage**

Ministry AWP employees who become involved in backcountry winter related incidents are protected by existing provincial government coverage and considered working as a Ministry employee, even if the response is made on a scheduled day off.

Wages, WSBC coverage and overtime benefits apply as when working for the Ministry.

## **6.0 Liability Coverage**

Section 18 of the Emergency Program Act, 1996 (appendix A) states that no person is liable for their actions (or lack of actions) which may cause injury, death or damage, provided they were acting in “good faith”.

## **7.0 Documentation**

The Canadian Avalanche Association, Avalanche Incident Report form (appendix 8.4) will be used to document pertinent information. In the urgency of the situation, it is important to take time to briefly document details of the rescue as it unfolds.

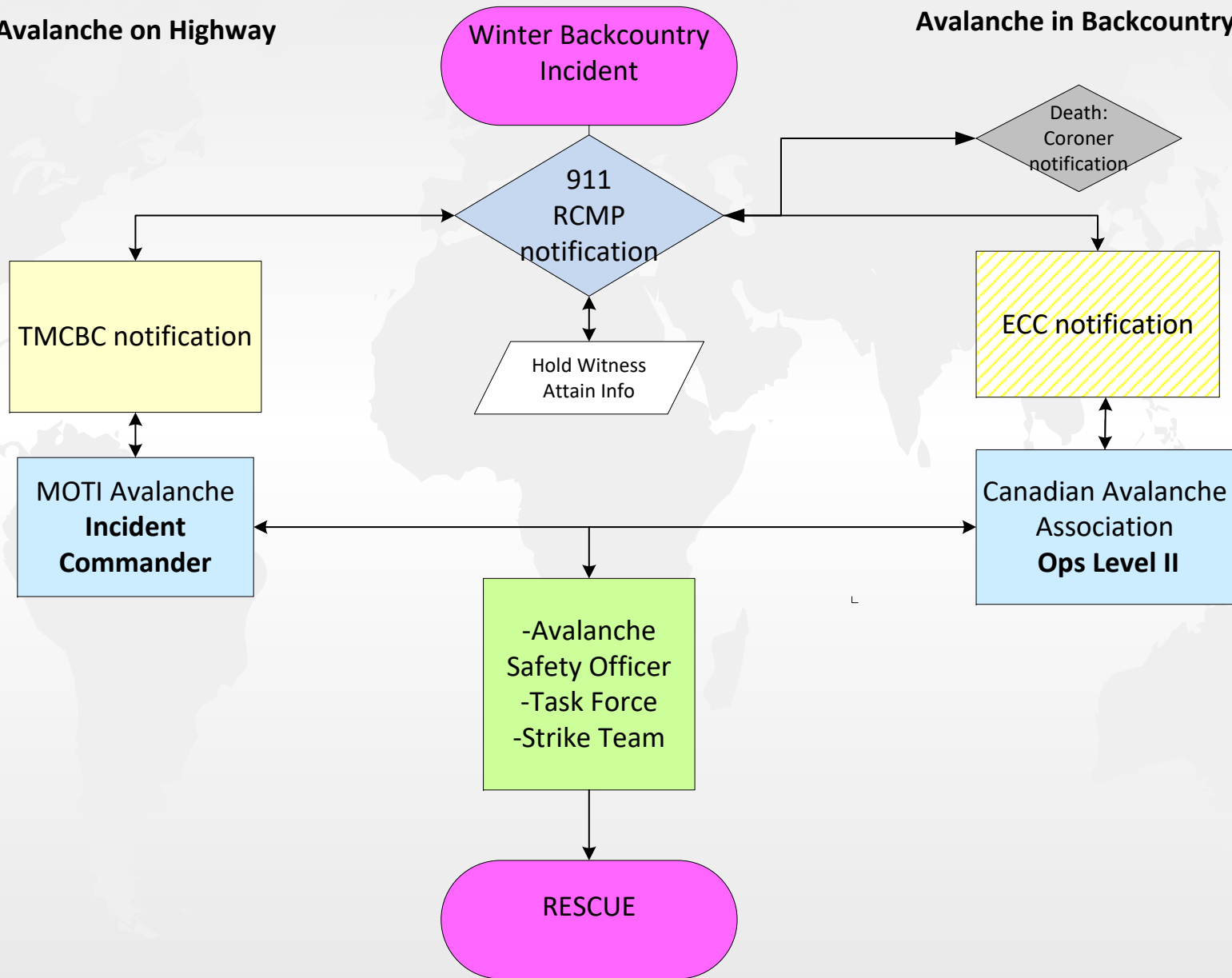
Attached is the EMBC Active Avalanche Safety Program ICS 305-A form (appendix 8.3).

Ministry, Avalanche staff should be aware that any written notes in field books can be used as evidence in a criminal or coroner court case. In consideration of this possibility, it is important to make field notes in accordance with the *CAA, Observation Guidelines and Recording Standards for Weather, Snowpack and Avalanches*.

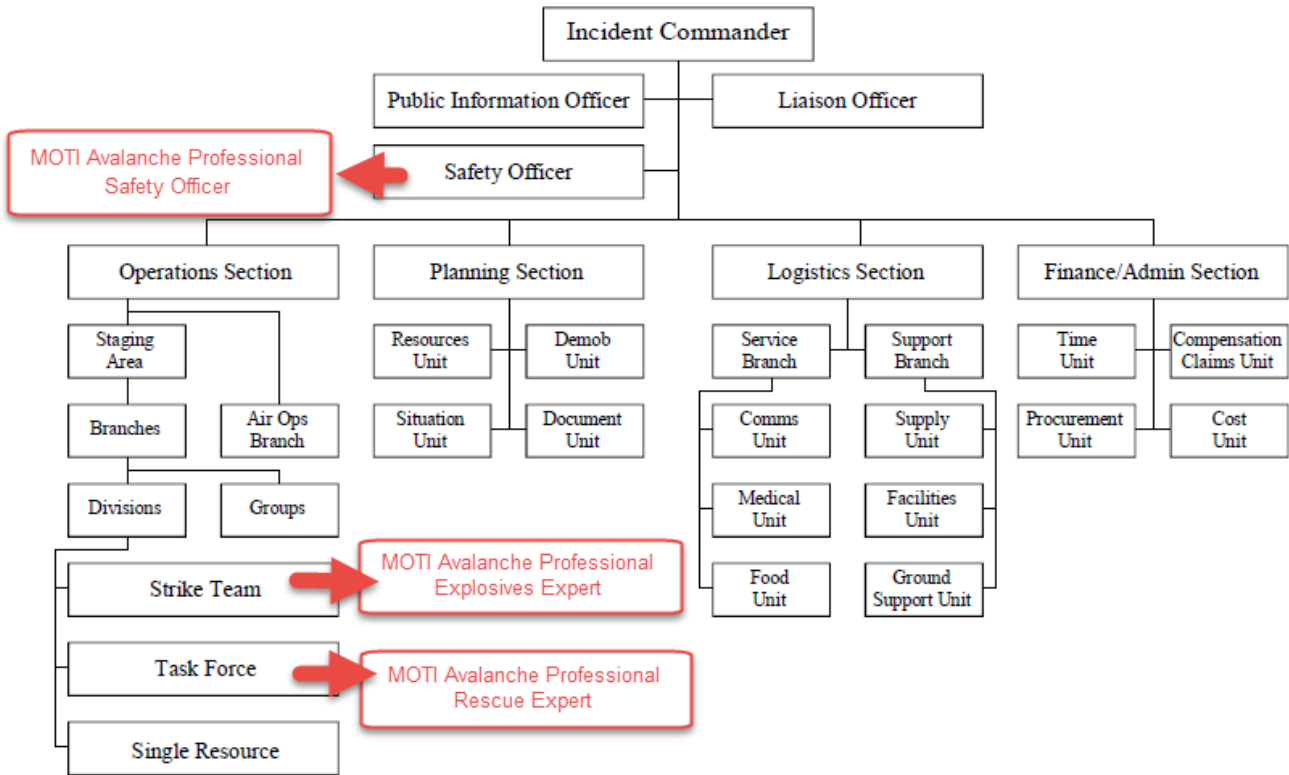
# EMBC -MOTI -AWP Winter Backcountry Rescue Call Out Protocol

**Avalanche on Highway**

**Avalanche in Backcountry**



# Incident Command System Flowchart





<b>ACTIVE AVALANCHE SAFETY PROGRAM</b>		TASK #	DATE & TIME PREPARED:
FOR OP. PERIOD #	TASK NAME:	PREPARED BY:	

IDENTIFIED HAZARD #	HAZARD NAME: <b>AVALANCHE</b>	SAFETY OFFICER:
LOCATION:		DESCRIPTION:
CURRENT DANGER RATING: (Check Highest Level for BTL, TL and/or ALP)		AVALANCHE TERRAIN EXPOSURE SCALE CLASSIFICATION:
<p> <input type="checkbox"/> Low      <input type="checkbox"/> Moderate      <input type="checkbox"/> Considerable      <input type="checkbox"/> High/Extreme or Unknown </p>		<input type="checkbox"/> SIMPLE <input type="checkbox"/> CHALLENGING <input type="checkbox"/> COMPLEX <input type="checkbox"/> UNKNOWN
		AVALANCHE INCIDENT DETAILS
		<input type="checkbox"/> Avalanche Incident Involvement Form Attached

ON-SITE OPERATIONS ACCESS / EGRESS, WEATHER AND AVALANCHE CONDITIONS ADVISORY:

.....

.....

.....

.....

ACTIVE AVALANCHE SAFETY PROGRAM MEASURES:

.....

.....

.....

SPECIAL INSTRUCTIONS:

.....

.....

AVALANCHE DANGER IDENTIFICATION / MITIGATION AND RISK CONTROL CHECKLISTS		
<input checked="" type="checkbox"/> REFERENCE DESCRIPTION	<input checked="" type="checkbox"/> ASSIGNMENT CHECKLIST	<input checked="" type="checkbox"/> SAFETY MEASURES
<input type="checkbox"/> PUBLIC AVALANCHE BULLETIN	<input type="checkbox"/> TEAM ASSIGNMENT	<input type="checkbox"/> Personnel Protective Equipment (Transceiver, Shovel, Probe)
<input type="checkbox"/> WEATHER FORECAST	<input type="checkbox"/> TEAM ASSIGNMENT BRIEFING	<input type="checkbox"/> Explosive Strike Team
<input type="checkbox"/> CAA InfoEx™	<input checked="" type="checkbox"/> SUPPLEMENTARY REFERENCES	<input type="checkbox"/> Helicopter Based Signal Search - Barryvox External Transceiver
<input type="checkbox"/> SNOW STABILITY EVALUATION WORKSHEET	<input type="checkbox"/> AVAILABLE AVALANCHE ATLAS'S	<input type="checkbox"/> Helicopter Based Rescue Effort - Class D Fixed Line Helicopter Support
<input type="checkbox"/> SNOW STABILITY FORECAST WORKSHEET	<input type="checkbox"/> LOCAL AVALANCHE PROFESSIONAL	<input type="checkbox"/> Rapid Intervention Team
<input type="checkbox"/> AVALANCHE PATH SUMMARY	<input type="checkbox"/> Name: _____	<input type="checkbox"/>



General

Occurrence date:..... Time:.....

Location description:..... Mountain range:.....
Easting:..... Northing:..... UTM zone:..... Map datum: [ ]Unknown [ ]NAD27 [ ]NAD83

Group type: [ ]Commercial, operation:..... [ ]Club [ ]Family/friends [ ]Other, specify:.....

Group activity (e.g. in-bounds/out-of-bounds/backcountry, skiing/snowboarding, etc.):.....

Did the group have a clear, identifiable leader? [ ]Unknown [ ]Paid [ ]Volunteer [ ]Group member [ ]No

# of: Females:..... Males:..... Juveniles (< 18 years old):.....
Skiers:..... Snowboarders:..... Snowmobilers:..... Other activity:....., specify:.....

# of people with: Transceivers:..... Probes:..... Shovels:..... Avalungs:..... Balloon flotation devices:.....
RECCO devices:..... Helmets:..... Other safety equipment:....., specify:.....

People involved with avalanche

# of people who were: Caught but not buried:.....
Partially buried, not critical:.....
Partially buried, critical:.....
Injured:.....

Table with 5 rows (Person 1-5) and columns for Name, Age, Gender (M/F), Education, Qualification, Working at time? (Unknown/Yes/No), and Leader at time? (Unknown/Yes/No).

Table with 4 columns: Avalanche training, Experience in avalanche terrain, Travel mode, and Skill with equipment. Each column has a 5-point scale (P.1-5) and corresponding checkboxes for various levels and types.

Table for Safety equipment with 5 rows (P. 1-5) and columns for Unknown, Transceiver, type, Probe, length, Helmet, type, Shovel, Avalung, Balloon, RECCO, and Other, specify.

Comment on safety equipment:.....

Table with 5 rows (P. 1-5) and columns for Activity just before avalanche, Was victim a trigger? (Unknown/Yes/No), Position in group (e.g. 2nd from front), and Location just before avalanche.

**People involved with avalanche (continued)**

Travel direction:

P.1 2 3 4 5  
     Unknown  
     Ascent  
     Descent  
     Level travel  
     Traversing  
     Stationary

Rescued by:

P.1 2 3 4 5  
     Unknown  
     Self-rescue  
     Group member  
     Another group  
     Organized rescue team, organization:....., rescue leader:.....  
     Other, specify:.....

Time when search started:.....

# of searchers:..... Names:.....

Search method(s) used: (number in chronological order)

P. 1 2 3 4 5  
 ..... Unknown  
 ..... Last seen point  
 ..... Sound (person calling)  
 ..... Visual (person visible)  
 ..... Surface clue (gear on surface), specify clue(s):.....  
 ..... Transceiver  
 ..... Hasty/spot probe, specify probe(s) used:.....  
 ..... Improvised probe, specify probe(s) used:.....  
 ..... Pinpoint probe after transceiver or dog, specify probe(s) used:.....  
 ..... Probe line  
 ..... Improvised shovel  
 ..... Specialized avalanche shovel  
 ..... Trenching  
 ..... RECCO/radar  
 ..... Dog  
 ..... Snowpack melted away  
 ..... Other, specify:.....

P. Further details about finding people:

1 .....  
 2 .....  
 3 .....  
 4 .....  
 5 .....

Degree of burial:

P.	Unknown	Caught but not buried	Partial - not critical	Partial - critical, depth (face), duration before face exposed	Complete, depth (face), duration before face exposed
1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> .....cm, .....min	<input type="checkbox"/> .....cm, .....min
2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> .....cm, .....min	<input type="checkbox"/> .....cm, .....min
3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> .....cm, .....min	<input type="checkbox"/> .....cm, .....min
4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> .....cm, .....min	<input type="checkbox"/> .....cm, .....min
5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> .....cm, .....min	<input type="checkbox"/> .....cm, .....min

P.	Distance to crown:	Distance carried:	Burial pocket:			Carried over cliffs:			Hit trees:			Hit rocks:			Into water:		
	.....m	.....m	Unknown	Yes	No	Unknown	Yes	No	Unknown	Yes	No	Unknown	Yes	No	Unknown	Yes	No
1	.....m	.....m	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	.....m	.....m	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	.....m	.....m	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	.....m	.....m	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	.....m	.....m	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Spine-axis orientation:

P.1 2 3 4 5  
     Unknown  
     Face-up  
     Face-down  
     Right-side-up  
     Left-side-up

Hip-axis orientation:

P.1 2 3 4 5  
     Unknown  
     Head above feet  
     Head below feet  
     Horizontal  
     Standing upright  
     Sitting upright  
     Other, specify:.....

Air pocket present:

P.	Unknown	Yes	No
1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**People involved with avalanche (continued)**

P.	Injuries:	Fatality:		Injuries assessed by an additional medical professional:		No
		Yes	No	Unknown	Yes, name, affiliation	
1	.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Ski/snowboard/snowshoe:** (if applicable)

Binding release:

Left					Right				
P.1	2	3	4	5	P.1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Unknown  
Manually  
Automatically  
Foot pulled out of boot  
Binding detached from ski/board/snowshoe  
Did not release

General rescue comments:.....

.....

.....

.....

.....

.....

**Snowmobile:** (if applicable)

Track:					Engine:					Type:					Orientation:				
P.1	2	3	4	5	P.1	2	3	4	5	P.1	2	3	4	5	P.1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Unknown  
< 141"  
141-159  
> 159"  
Unknown  
< 500 cc  
500-800 cc  
800-1000 cc  
> 1000 cc  
Unknown  
Trail  
Utility/work  
Mountain  
High-performance  
Unknown  
Slope-parallel  
Cross-slope  
Other, specify:.....

P.	Distance from rider along flow:			Distance from rider across flow:		Skier's left of flow	Skier's right of flow
	Up-flow	Down-flow	Up-flow	Down-flow			
1	.....m	<input type="checkbox"/>	<input type="checkbox"/>	.....m	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	.....m	<input type="checkbox"/>	<input type="checkbox"/>	.....m	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	.....m	<input type="checkbox"/>	<input type="checkbox"/>	.....m	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	.....m	<input type="checkbox"/>	<input type="checkbox"/>	.....m	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	.....m	<input type="checkbox"/>	<input type="checkbox"/>	.....m	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Avalanches**

Date observed:..... Observed by:..... Number of avalanches (Av.): .....

Av.	Location description:	Easting:	Northing:	Aspect:	Incline:	Trigger pt. incline:	Max. incl. in vicinity:	Vegetation band:			
								Unknown	BTL	TL	Alp
1	.....	.....	.....	.....	.....°	.....°	.....°	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	.....	.....	.....	.....	.....°	.....°	.....°	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	.....	.....	.....	.....	.....°	.....°	.....°	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Av.	Time:	Size:	Type:			Distance Ran:	Trigger:	Remotely triggered:		# of people within		
			Unknown	Slab	Loose			Unknown	Yes, dist. to trigger	No	1 m	2 m of trigger pt.:
1	.....	.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	.....m	.....	<input type="checkbox"/>	<input type="checkbox"/> , .....m	<input type="checkbox"/>	.....	.....
2	.....	.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	.....m	.....	<input type="checkbox"/>	<input type="checkbox"/> , .....m	<input type="checkbox"/>	.....	.....
3	.....	.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	.....m	.....	<input type="checkbox"/>	<input type="checkbox"/> , .....m	<input type="checkbox"/>	.....	.....

**Human triggered avalanches:** (if applicable)

Av. 1 2 3

Person who triggered avalanche was #: ..... on the slope.

**Weak layer:**

Av.	Primary form:	Size:		Secondary form:	Size:		Burial date:
		Min.	Max.		Min.	Max.	
1	.....	.....mm	.....mm	.....	.....mm	.....mm	.....
2	.....	.....mm	.....mm	.....	.....mm	.....mm	.....
3	.....	.....mm	.....mm	.....	.....mm	.....mm	.....

## Avalanches (continued)

### Bed surface:

Av.	Primary form:	Size:		Secondary form:	Size:		Level in snowpack:				Stepped:		
		Min.	Max.		Min.	Max.	Unknown	Storm snow	Old snow	Ground	Unknown	Yes	No
1	.....	.....mm	.....mm	.....	.....mm	.....mm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	.....	.....mm	.....mm	.....	.....mm	.....mm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	.....	.....mm	.....mm	.....	.....mm	.....mm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### Slab avalanches: (if applicable)

Slab thickness:				
Av.	Avg.	Trigger pt.	Slab width:	Slab hardness:
1	.....cm	.....cm	.....m	.....
2	.....cm	.....cm	.....m	.....
3	.....cm	.....cm	.....m	.....

### Liquid water content:

Av.	Start zone:				Deposit:			
	Unknown	Dry	Moist	Wet	Unknown	Dry	Moist	Wet
1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### Start zone:

Solar exposure:				Wind exposure:				Skiability:				Relative location:			
Av.	1	2	3	Av.	1	2	3	Av.	1	2	3	Av.	1	2	3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Unknown	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Unknown	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Unknown	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Within ski area
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Solar aspect(s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Windward	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	No	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Adjacent to ski area
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Shaded solar aspect(s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Lee	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ski run
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Non-solar aspect(s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Cross-loaded	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	No-yes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Not on ski run
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sheltered					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Climbing route
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Down-flow					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Other, specify:.....
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Wind pillow (obsolete)								

### Usage history:

Av.	1	2	3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Unknown
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Not previously skied/sledded
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Previously skied
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Previously sledded
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Heavily skied
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Heavily sledded
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Previously controlled with results
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Previously controlled without results
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Previously slid

### Comments on start zone: (terrain characteristics, ground cover, etc.)

1. ....

2. ....

3. ....

### Comments on trigger point: (terrain feature, proximity to ridge top, wind effects, etc.)

1. ....

2. ....

3. ....

### Additional avalanche comments:

1. ....

2. ....

3. ....

## Snowpack

### Snowpack tests (T.):

T.	Type:	Location:	Test depth:	Incline:	Test result:	Fracture character:	Fracture depth:	Depth in profile:	Comments/layer ID:
1	.....	.....	.....cm	.....°	.....	.....	.....cm	.....cm	.....
2	.....	.....	.....cm	.....°	.....	.....	.....cm	.....cm	.....
3	.....	.....	.....cm	.....°	.....	.....	.....cm	.....cm	.....

Tracks on slope: Unknown From the same day Since last storm Old tracks visible None

Tracks on bed surface: Unknown Yes No

Comments on snowpack:.....

.....

**Weather**

Weather obs. (Wx.):                    1                                    2                                    3  
Date:                                    .....  
Time:                                    .....  
Location:                                .....  
Easting                                    .....  
Northing                                .....  
Elevation:                                .....m                                .....m                                .....m  
Sky condition:                         .....  
Valley fog: (top level)                .....m                                .....m                                .....m  
Precip. type/rate:                     .....  
Surface form/size:                    .....

**Temperature:**     Manual     Automatic  
Wx.1   Interval:     Wx.2   Interval:     Wx.3   Interval:  
Min.:                .....°C     .....hrs     .....°C     .....hrs     .....°C     .....hrs  
Max.:                .....°C     .....hrs     .....°C     .....hrs     .....°C     .....hrs  
Present:             .....°C                                .....°C                                .....°C  
3 hr change:        .....°C                                .....°C                                .....°C  
1 day change:       .....°C                                .....°C                                .....°C

**Snow height:**     Manual     Automatic  
Water     Cleared                                Water     Cleared                                Water     Cleared  
Wx.1   equiv.:     date, time:                                Wx.2   equiv.:     date, time:                                Wx.3   equiv.:     date, time:  
HINT:        .....cm     .....mm     .....  
HST:        .....cm     .....mm     .....  
H2D:        .....cm     .....mm                                    .....cm     .....mm  
HN24:       .....cm     .....mm                                    .....cm     .....mm  
HS:         .....cm     .....mm                                    .....cm     .....mm

Amount of new snow at accident site within 24 hours prior to accident: .....cm

**Wind:**     Manual     Automatic  
Wx.                1                2                3  
Speed:            .....  
Direction:        .....  
Transport ext:    .....  
Transport dir:    .....

**Precipitation:**     Manual     Automatic  
Wx.1   Interval:     Wx.2   Interval:     Wx.3   Interval:  
Rain gauge:            .....mm     .....hrs     .....mm     .....hrs     .....mm     .....hrs  
Precip. gauge: (accumul.)     .....mm                                .....mm                                .....mm

Comments on weather:.....  
.....  
.....

**Assessment by group member(s)**

Unknown     Yes     No  
Did you meet any other people on your trip previous to the avalanche?                 
Was your group pressured into actively pursuing a stated goal because of time or other constraints?                 
Were you in an obvious avalanche path when the avalanche occurred?                 
Was there a terrain trap (e.g. gully, cliff, trees, crevasse) below your route when the avalanche occurred?                 
Was your group reducing the risk when the avalanche occurred (e.g. spaced apart)?                 
Were you aware of any whumpfs or cracking on your route within 24 hrs previous to avalanche?                 
Were you aware of drifting snow on the avalanche slope within 24 hrs previous to avalanche?                 
Were you aware of any avalanche activity in the same mtn. range within 24 hrs previous to avalanche?                 
Comment on avalanche activity:.....  
Was the aspect on which the avalanche occurred declared unfavourable in the avalanche bulletin?                 
How would you rate your group's terrain selection with respect to conditions when the avalanche occurred?     unknown  
Conservative     Appropriate     Aggressive     Other, specify:.....  
How familiar was your group or decision maker with the area you were travelling in?     Unknown     Very     Somewhat     Not  
Did your group have a clear, identifiable leader?     Unknown     Paid     Volunteer     Group member     No

**Assessment by group member(s) (continued)**

What information sources did you check before the trip?	Overall importance:	Rate the source with respect to information on:			
		Avalanche activity	Whumpfs or cracking	Drifting snow	Unfavourable aspect
<input type="checkbox"/> Unknown	.....	.....	.....	.....	.....
<input type="checkbox"/> Own observations	.....	.....	.....	.....	.....
<input type="checkbox"/> CAA avalanche bulletin	.....	.....	.....	.....	.....
<input type="checkbox"/> Local avalanche advisory	.....	.....	.....	.....	.....
<input type="checkbox"/> Local backcountry operator	.....	.....	.....	.....	.....
<input type="checkbox"/> Local ski patrol	.....	.....	.....	.....	.....
<input type="checkbox"/> InfoEx	.....	.....	.....	.....	.....
<input type="checkbox"/> Contacted others	.....	.....	.....	.....	.....
<input type="checkbox"/> Trip report	.....	.....	.....	.....	.....
<input type="checkbox"/> Guide book	.....	.....	.....	.....	.....
<input type="checkbox"/> Terrain photo	.....	.....	.....	.....	.....
<input type="checkbox"/> Map	.....	.....	.....	.....	.....
<input type="checkbox"/> Other, specify:.....	.....	.....	.....	.....	.....
<input type="checkbox"/> None	.....	.....	.....	.....	.....

0 - N/A  
 1 - Not important  
 2 - Somewhat important  
 3 - Important  
 4 - Very important  
 5 - Extremely important

Additional sources used during the trip:	Overall importance:	Avalanche activity	Whumpfs or cracking	Drifting snow	Unfavourable aspect
<input type="checkbox"/> Unknown	.....	.....	.....	.....	.....
<input type="checkbox"/> Own observations	.....	.....	.....	.....	.....
<input type="checkbox"/> Other recreationists	.....	.....	.....	.....	.....
<input type="checkbox"/> Local backcountry operator	.....	.....	.....	.....	.....
<input type="checkbox"/> Local ski patrol	.....	.....	.....	.....	.....
<input type="checkbox"/> Other, specify:.....	.....	.....	.....	.....	.....
<input type="checkbox"/> None	.....	.....	.....	.....	.....

Which human factors contributed to the accident?	Overall importance
<input type="checkbox"/> Unknown	.....
<input type="checkbox"/> Blue sky	.....
<input type="checkbox"/> Lack of designated leader	.....
<input type="checkbox"/> Poor communication within group	.....
<input type="checkbox"/> Over importance attached to destination / goal	.....
<input type="checkbox"/> Rush to complete trip (e.g. return to trailhead/hut)	.....
<input type="checkbox"/> Thrill of descent (only if incident occurred immediately prior to or during descent)	.....
<input type="checkbox"/> Overconfidence	.....
<input type="checkbox"/> Impulsiveness	.....
<input type="checkbox"/> Invulnerability	.....
<input type="checkbox"/> Macho attitude	.....
<input type="checkbox"/> Resignation	.....
<input type="checkbox"/> Anti-authority	.....
<input type="checkbox"/> None	.....

**Expert assessment**

Name:..... Qualification:.....

	Unknown	Yes	No
Was the aspect on which the avalanche occurred declared unfavourable in the avalanche bulletin?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was the group reducing the risk when the avalanche occurred (e.g. spaced apart)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Were any group members in or above a terrain trap when the avalanche occurred?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was the group in an obvious avalanche path when the avalanche occurred?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was there evidence of any whumpfs or cracking on the route within 24 hrs previous to avalanche?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was there drifting snow on the avalanche slope within 24 hrs previous to avalanche?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Did the group meet any other people on the same trip previous to the avalanche?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was the group pressured into actively pursuing a stated goal because of timing or other constraints?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Did 'grouping up' play a significant role in triggering the avalanche?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was there any relevant avalanche activity in the same mtn. range within 24 hrs previous to avalanche?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comment on avalanche activity:.....

How familiar was the group or decision maker with the terrain?	<input type="checkbox"/> Unknown	<input type="checkbox"/> Very	<input type="checkbox"/> Somewhat	<input type="checkbox"/> Not
How would you rate the group's terrain selection with respect to conditions when the avalanche occurred?	<input type="checkbox"/> Unknown			
	<input type="checkbox"/> Conservative	<input type="checkbox"/> Appropriate	<input type="checkbox"/> Aggressive	<input type="checkbox"/> Other, specify:.....

**Expert assessment (continued)**

Sources of information used:	Overall importance:	Rate the source with respect to information on:			
		Avalanche activity	Whumpfs or cracking	Drifting snow	Unfavourable aspect
<input type="checkbox"/> Unknown	.....	.....	.....	.....	.....
<input type="checkbox"/> Own observations	.....	.....	.....	.....	.....
<input type="checkbox"/> CAA avalanche bulletin	.....	.....	.....	.....	.....
<input type="checkbox"/> Local avalanche advisory	.....	.....	.....	.....	.....
<input type="checkbox"/> Local backcountry operator	.....	.....	.....	.....	.....
<input type="checkbox"/> Local ski patrol	.....	.....	.....	.....	.....
<input type="checkbox"/> InfoEx	.....	.....	.....	.....	.....
<input type="checkbox"/> Contacted others	.....	.....	.....	.....	.....
<input type="checkbox"/> Trip report	.....	.....	.....	.....	.....
<input type="checkbox"/> Guide book	.....	.....	.....	.....	.....
<input type="checkbox"/> Terrain photo	.....	.....	.....	.....	.....
<input type="checkbox"/> Map	.....	.....	.....	.....	.....
<input type="checkbox"/> Other, specify:.....	.....	.....	.....	.....	.....
<input type="checkbox"/> None	.....	.....	.....	.....	.....

0 - N/A  
 1 - Not important  
 2 - Somewhat important  
 3 - Important  
 4 - Very important  
 5 - Extremely important

Which human factors contributed to the accident?	Overall importance
<input type="checkbox"/> Unknown	.....
<input type="checkbox"/> Blue sky	.....
<input type="checkbox"/> Lack of designated leader	.....
<input type="checkbox"/> Poor communication within group	.....
<input type="checkbox"/> Over importance attached to destination / goal	.....
<input type="checkbox"/> Rush to complete trip (e.g. return to trailhead/hut)	.....
<input type="checkbox"/> Thrill of descent (only if incident occurred immediately prior to or during descent)	.....
<input type="checkbox"/> Overconfidence	.....
<input type="checkbox"/> Impulsiveness	.....
<input type="checkbox"/> Invulnerability	.....
<input type="checkbox"/> Macho attitude	.....
<input type="checkbox"/> Resignation	.....
<input type="checkbox"/> Anti-authority	.....
<input type="checkbox"/> None	.....

Additional comments on human factors:.....  
 .....

**Property damage**

Value of property lost or damaged: \$..... (CND)

Comments about property lost or damaged:.....  
 .....  
 .....

**Reported by**

Name:..... Qualification:..... Date:.....

Address:.....

Phone #:..... Email:.....

Avalanche training:  < 2 day course  2-3 day course  4-5 day course  > 5 day course  CAA Level 1  CAA Level 2  
 Other, specify:.....

**Additional contact person**

Name:.....

Address:.....

Phone #:..... Email:.....

**Enclosures** – Include additional information that is available: (e.g. weather observations in greater detail, snow profiles, map with location of incident, sketch of avalanche showing location of people and objects before and after avalanche, narrative describing how people and/or objects became involved with the avalanche, photographs, copy of the report from any rescue organization involved, etc)

*Note: This information is intended for public education and information. It may be summarized and published by the CAA/CAC. The reporters name will not be published by the CAA/CAC without his or her written permission.*

Please send to: Canadian Avalanche Centre, PO Box 2759, Revelstoke, B. C., Canada, V0E 2S0. Fax: (250) 837-4624

Received by:..... Date:..... Time:.....