TOPONEIGE : USER GUIDE

Each route is identified at the top of the page by a letter (for the area) and a number (for the route number within the area). In the bottom right of the box is the highest altitude reached via the listed route. Below the name of the route (summit, pass, loop…), a secondary title provides route details. Two columns provide the technical data for the route:

- the left column provides objective (or measurable) information : altitude, vertical gain/drop, slope aspect, slope incline, map reference (1/25 000).
- on the right are the abstract elements *(the result of calculations or convention)* : time, skiing grade, alpine grade, exposure ; mountain huts and the page numbers showing photos of the route (☎).

1. Objective information

Start: indicates the altitude at which the route begins. If the route finishes at a different point than its start, we mention Start/End and both altitudes.

V+/V-: indicates the vertical gain and drop. In most cases (round-trips, loops), there is only one number. When there are two, the other number indicates a traverse or a start with a ski lift. The calculation takes into account intermediary descents if they are significant. This explains why the indication V+ may not correspond to the mere difference between the start and finish points. (The index only mentions the V+ for the longest day).

Aspect: corresponds to the slope aspect of the majority of the route, or, for difficult routes, to the aspect of the steepest slope (the final couloir). For routes including slopes with multiple aspects, we simply mention "all". This general indication does not provide enough information regarding the snow quality. In the spring, a couloir facing south but protected on its east side will present the characteristics of a west face. In winter, an east face with steep-sided walls will remain as cold as a north face, etc.

Slope: when possible, we measured slope angle on a 1/25 000 map of the area. Where certain sections are too short or reading contour lines on a map too difficult, we made an estimate (based on the judgment of various ski-mountaineers). In both cases, the margin of error should not exceed two degrees. For hikes with slopes under 30°, we do not always provide detail, the slope angle no longer being a selection criterion.

Note: *the angles measured on the map are made on dry ground. Snow accumulation can cause the slope angle to vary. These variations are minor over a long section of terrain but can be quite relevant in very short sections, particularly in complicated rocky faces with winding routes.*

2. Subjective information

Time: indicates the overall time it takes to complete the route - including the climb and the descent as well as resting 30 minutes at the top. The time estimate is based on a skier climbing up at 400 meters/hour (m/h) and skiing down at 2000 m/h (on easy terrain and soft snow). For skiers with little training, the "time" corresponds to time necessary to climb up. Despite being relative, the "time" helps to better understand the V+ information. It takes into account flat or technical sections as well as the various equipment maneuvers (taking on/off skins, rope handling, etc.).

SKI rating: divided into four grades with three subdivisions (ex. 3.1 = lower; 3.2 = middle; 3.3 = upper), and a fifth grade being open to further subdivisions (with 5.5 as the maximum in 2008).

◗ **Ski 1.** Beginner alpine skiing (as opposed to Nordic skiing). Slope angle does not exceed 30°; wide-open slopes with a vertical gain/drop under 800 m. Exposure and avalanche risk are very low.
◗ **Ski 2.** Few technical difficulties: slope angle does not exceed 35° but the vertical gain/drop, the exposure as well as objective hazards may be significant.
◗ **Ski 3.** The true start of ski mountaineering: technical sections, long sustained 35° slopes, with short sections up to 40-45°. Thick, forested sections on lower angle slopes, steep forest roads.
◗ **Ski 4.** Narrow couloirs or very steep slopes: sustained sections of 40 to 45° (more than 200 m). Uneven terrain at mid altitudes or very dense forests even on moderate slopes.
◗ **Ski 5.** Very steep terrain: sustained 45° for more than 300 m, or with 50° sections for longer than 100 m.

ALPINE rating: this is the traditional rating system used for mountaineering on snow-covered terrain. It usually has some correlation with the ski rating. This rating system follows the UIAA alpinism rating system (French derivative).

◗ **R,** basic hiking or snowshoeing (randonnée): ski 1 and 2.1, 2.2 (in certain cases 2.3). With the exception of adverse conditions (icy rain or pure ice), specific equipment such as crampons is rarely used.
◗ **F,** easy (facile): ski 2.1 if on a glacier, otherwise from ski 2.3 to 3.2 (sometimes 3.3).
◗ **PD,** not very difficult (peu difficile): ski 3.3 to 4.2 (sometimes 4.3).
◗ **AD,** fairly difficult (assez difficile): ski 4.3 to 5.2.
◗ **D,** difficult (difficile): starting at ski 5.3.

The alpine rating is provided to allow mountaineers (without skis) to use the TOPONEIGE guide in snow conditions. We presume that the entire route is done on foot, with snowshoes or crampons. The alpine rating is also useful for skiers on certain routes. When the alpine rating is much higher than the corresponding ski rating, the difficult ascent section(s) are not meant to be skied. Difficulties not related to snow (rock or ice) are specified in the technical description.

Note: *for the purposes of this guidebook, we consider all routes to be covered with snow. The alpine ratings should not be compared with summer ratings due to most routes being snow-free in the summer. In the winter, due to snow conditions, new routes appear… then disappear. Some easy summer ascents with good rock holds can become difficult ski ascents when covered with snow. The opposite is also true: very unstable and dangerous terrain in the summer may transform into a very gentle, easy to ascend slope in the winter for the skier or mountaineer.*

Exposure rating: in general, one should assume that:
- For a 35° slope, it is impossible to stop a fall on icy snow.
- At 45°, it is extremely difficult to stop a fall even on soft snow.
- Above 50°, a fall that is not halted immediately is usually impossible to stop even in deep snow. In addition to the danger directly related to slope angle, the exposure rating indicates the possible risk of an obstacle causing wounds to the skier during an uncontrolled fall.

◗ ***Exposure 1:*** with the exception of trees or rocks, there are no significant obstacles, apart from the slope itself. A combination of hard snow and a steep incline can however present a potential risk for injury.
◗ ***Exposure 2:*** the fall line includes some form of cliffs that increases the risk of injury for the skier in the case of a fall. If the fall over the cliff is unavoidable, the risk of hitting the rock is not. Moderately winding couloirs also enter this category.
◗ ***Exposure 3:*** a fall will likely result in the skier passing over a cliff, but the impact with an obstacle is avoidable. Winding couloirs with the risk of hitting rock fall into this category (death is highly probable).
◗ ***Exposure 4:*** high rock faces involving multiple rebounds and impacts in the event of a fall, death is guaranteed.

The exposure rating is a key component of ski mountaineering, since one usually skis without a belay or placing protection (as opposed to rock-climbing). Stress due to exposure can cause the skier to significantly contract his muscles, further inhibiting decision making. The exposure rating thus increases the difficulty level of a route.

Other factors contributing to difficulty

Beyond slope and exposure, one must also consider:
- The overall vertical gain/drop as well as altitude, which can have a significant effect on the skier's physical ability during a difficult section.
- Length: a 45° slope over 500 vertical meters is much more difficult than a short 50° section.
- Terrain configuration: a narrow couloir with a tight bottleneck in the middle is much more demanding than a wide-open slope where it is much easier to sideslip.
- Lighting: psychologically, sections in the shade are more stressful than those of the same difficulty but in the sun.
- Above all, snow conditions: If, for the snow quality specialist, there exists an infinite variety of snow crystals, for the skier there are two main categories to consider, packed or firm snow (edge use important), and deep snow (easier to stop and rest).

Varying snow conditions affect difficulty depending on the steepness of a given slope. The ski rating for a route is based upon "standard" snow conditions, defined as "firm" conditions, either smooth spring "corn" snow, or cold "chalky" winter snow (fine snow crystals).

Low angle slopes: powder and breakable crust increase the difficulty (sometimes considerably).
High angle slopes: deep snow decreases the difficulty, whereas firmer conditions (especially icy snow) increase it.
Uneven terrain *(dense forests or streams)*: snow conditions are just as important to consider when on steep terrain.
We estimate that for any slope over 35°, firm snow conditions increase the difficulty approximately four levels: a route therefore changes from a 3.3 to a 5.1 rating etc.

3. Route

Route descriptions are based upon a 1/25000th map. Terrain descriptions such as "left bank" or "right bank" are based upon downward flow (water flow in a creek bed).

All directions provided are based on the direction of travel:
- when ascending, if you end up in a small valley for example, "head left" translates to taking the right bank; "traverse using the left bank" means head right.
- when descending, the direction provided corresponds to the skier's view (skier's right or skier's left).

All bearings provided are also based upon the direction of travel:
- when ascending, "head south towards the slope facing you" means that the slope to ascend is a north facing slope.
- when descending, "descend towards the south" means that the slope to descend is south facing.

This guidebook is written first and foremost for the skier: all other climber categories should filter the information provided according to their chosen means of travel, for example:

- when ascending, those using snowshoes might be able to take a more direct route through a forest.

- when descending, snowboarders will need to pay much more attention to flat sections.

4. Commentary

Most route descriptions conclude with commentary by the author. Although the technical information provided is largely sufficient in order to complete the route, these additional observations often include suggestions for combining routes, for traverses or for hub and spoke tours with a multi-day base camp *(a mountain hut or a valley)*.