

Operation Checklists - pilot project to support disaster control for potential dam failures of snowmaking reservoirs in Carinthia (Austria)

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INTRODUCTION

According to the developed methodology of operation checklists for floods at river Gössering (see Koboltschnig et al. submitted to IP 2016), checklists for the risk of dam failures of two snowmaking reservoirs (Schnittlauchkofel and Rosskofel at Nassfeld skiing resort in Southern Austria) were elaborated.

Due to the Austrian legislation (executive order against malfunctions) for each artificial snowmaking reservoir an emergency plan has to be elaborated to get a legal permission from the authority during the approval process of the snowmaking facilities. Emergency plans mainly consist of a map showing the area, which can be affected by the flash flood after a dam brake and a technical report describing responsibilities - mainly who should be informed concerning disaster relief. The obligatory alarm plan does not give further information on measures, which support disaster relief. The introduced operation checklists were developed as guideline for relief units such as fire department or mountain rescue services as well as for the internal coordination of the skiing resort (Bergbahnen Nassfeld) during the missions and describe potential measures for further monitoring, evacuation and road closings.

METHODOLOGY

The basis for the operation checklist has been an existing emergency plan for the snowmaking reservoirs. This plan contains a plant description, the definition of damage scenarios as well as hazard zones, which are based on hydraulic modeling. The reservoir failures that potentially occur are assigned to one damage scenario depending on the type and intensity of observed effects. Each failure scenario involves specific operation guidelines within the internal operating procedures.

The purpose of the operation checklists is to support the operation controller as well as the relief units in case of a flood event in order to adopt a targeted and timely response with available resources. First of all, based on specific hazard scenarios, areas where people might be endangered were determined in a joint workshop. These cover - depending on the season winter or summer - slopes, hiking trails, access roads, crossings of the downstream Oselitzen torrent (in case of a failure, the drainage runs through the Oselitzengraben into the river Gail), climbing zones in the Oselitzengraben, road bridges and so on. Depending on the hazard scenarios, measures which are defined in the emergency plan, were established to best cover the range of the endangered zones.

According to the damage scenario, different measures should be determined. For example in the event of a damage scenario such as „failure including endangerment to the stability of the construction“ measures focus on providing information/warnings and preparing response is recommended, whilst in the event of „imminent danger of dam failure“ the key issues are blockading and evacuation. Specific measures, such as blockades and the interruption of cable car operation for especially sensitive infrastructures, are already provided in the case of lower hazard scenarios.

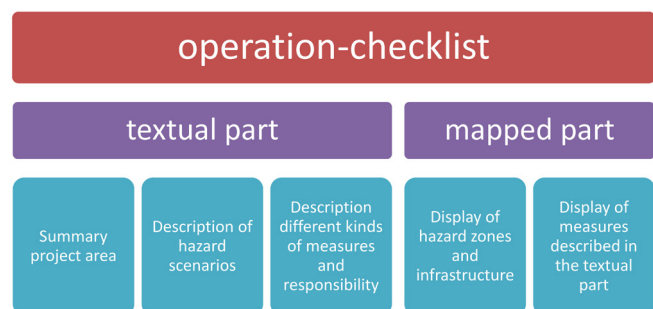


Figure 1. Structure of the operation checklist for the snowmaking reservoirs

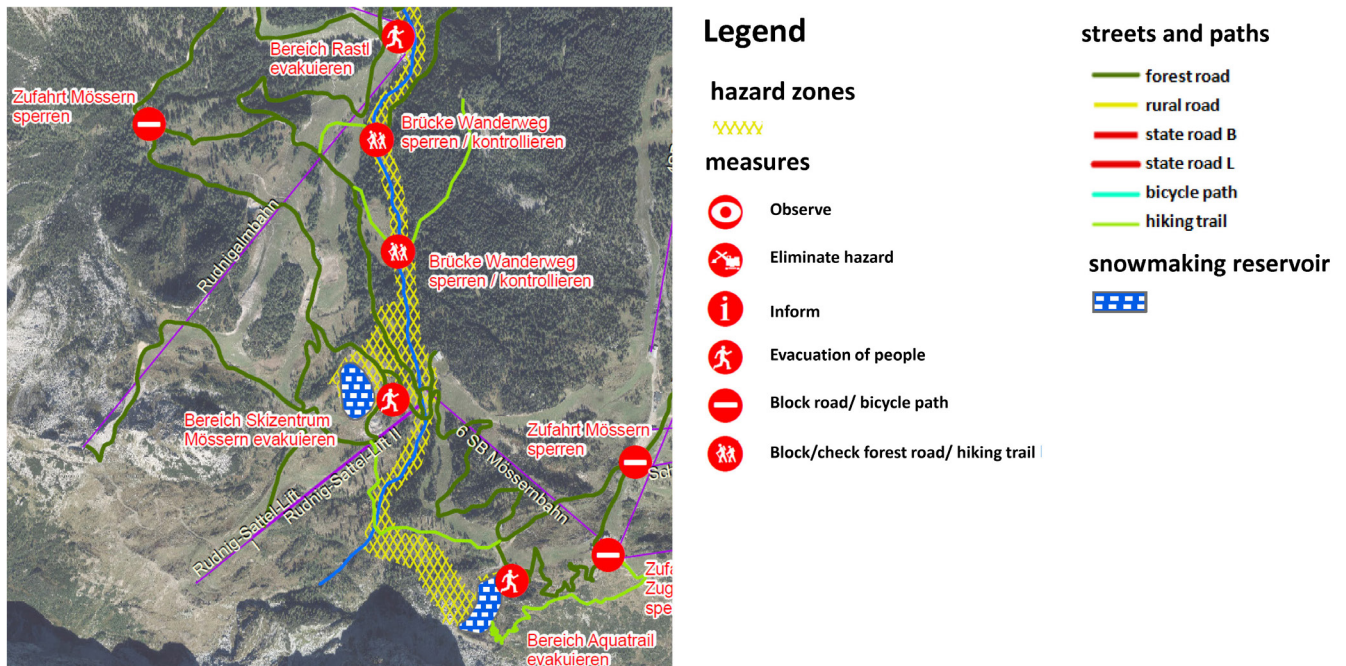


Figure 2. Detail of the operation checklist map (left) and the legend including different types of measures (right)

RESULTS

In the same way as the operation checklists in case of a flood event in Hermagor (see Koboltschnig et al. submitted to IP 2016), the checklists are divided into a textual part and a map (see Figure 1). The map presents the potential hazard zones as well as categorized measures located in the site map (see Figure 2).

The textual part presents:

- a summary of the project area
- a description of different damage scenarios concerning the snowmaking reservoir
- a description of different kinds of measures and the associated responsibility
- a contact list including the person in charge, relief units and public authorities

KEYWORDS

operation checklist; disaster control; decision support system; stakeholder participation; ski resort

CONCLUSIONS

The creation process including intense stakeholder participation, the chosen methodology of the located measures as well as the textual description in a well-arranged document are meant to optimize engaged resources and targeted measures in case of operation.