



## **DAM SAFETY**

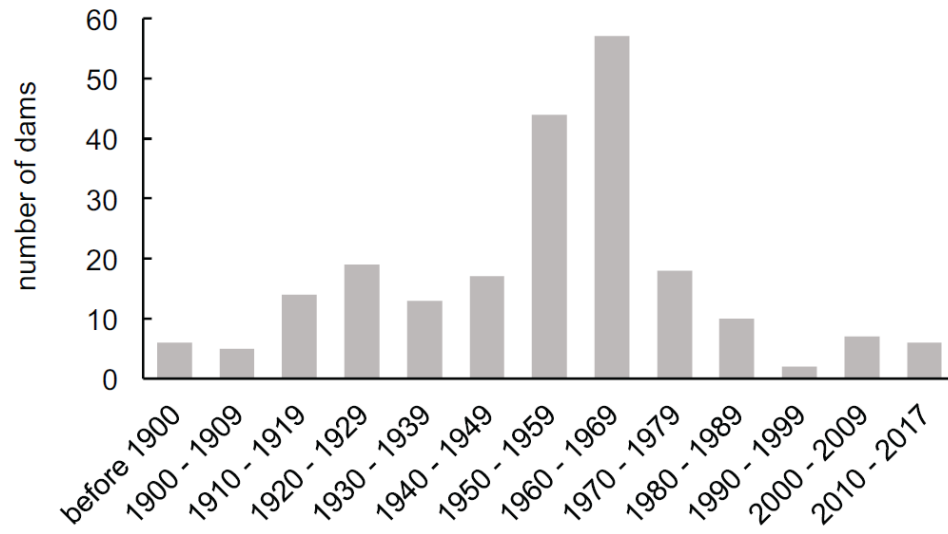
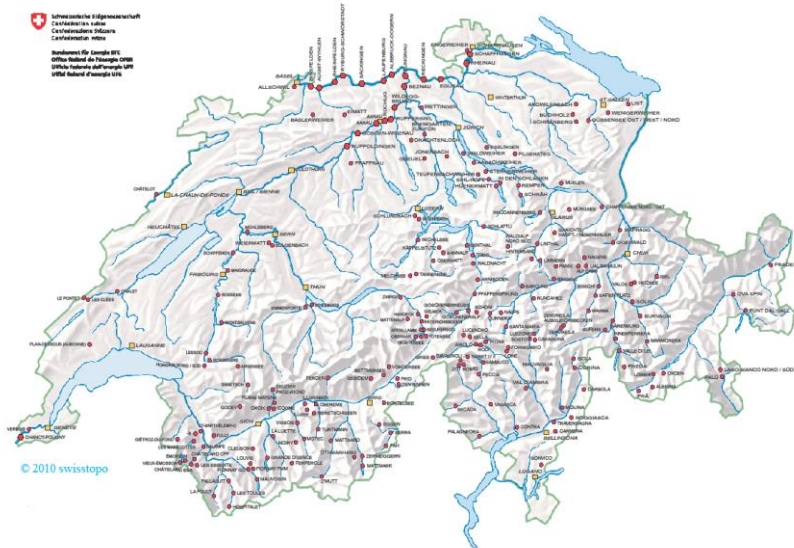
### **THE SWISS CONCEPT FOR SURVEILLANCE AND PREPAREDNESS**

**Alexandre WOHNLICH**  
Head of Dam Department, STUCKY Ltd  
Switzerland

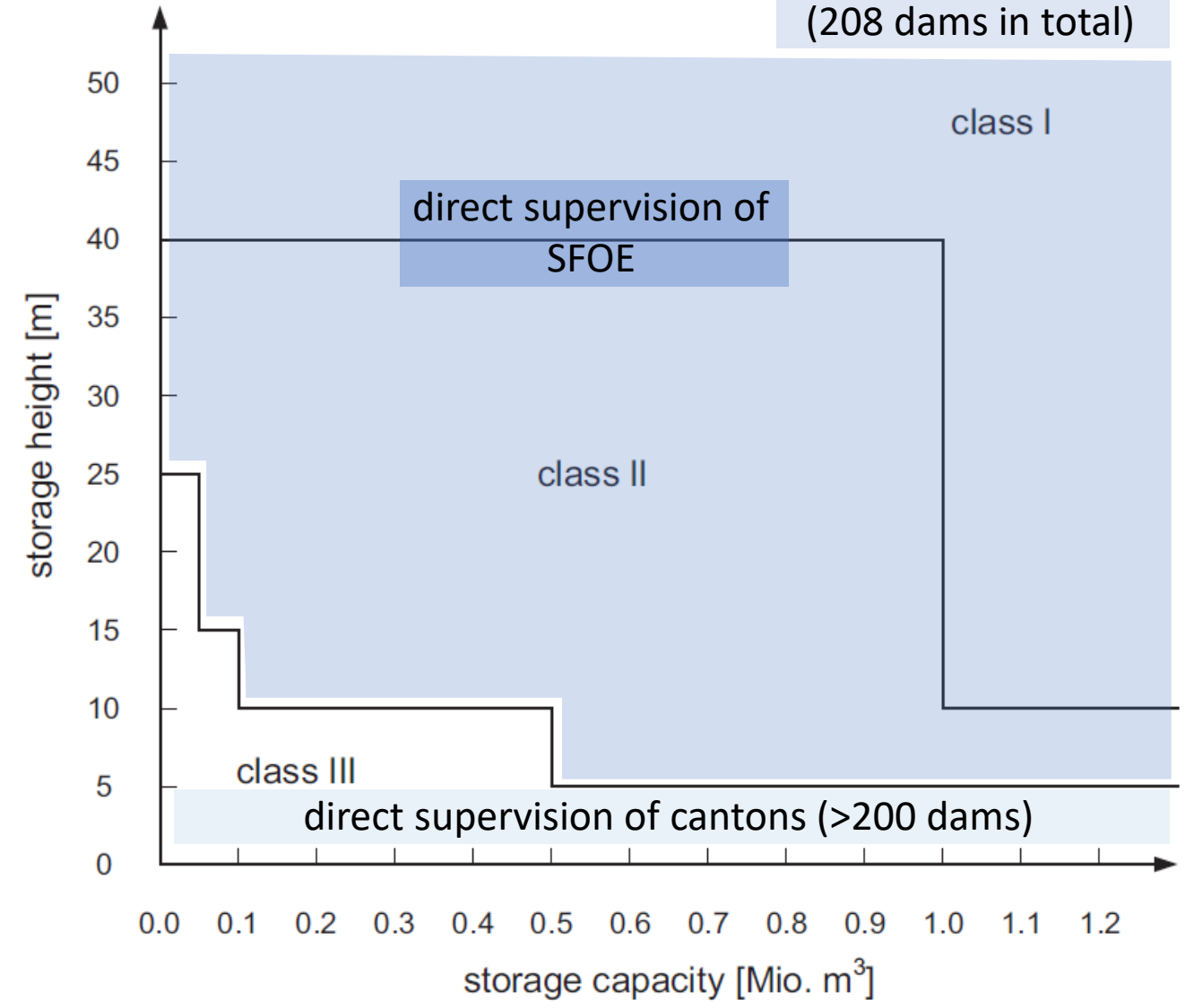


# The Swiss Guidelines

Large dams according to Swiss legislation (208 dams in total)



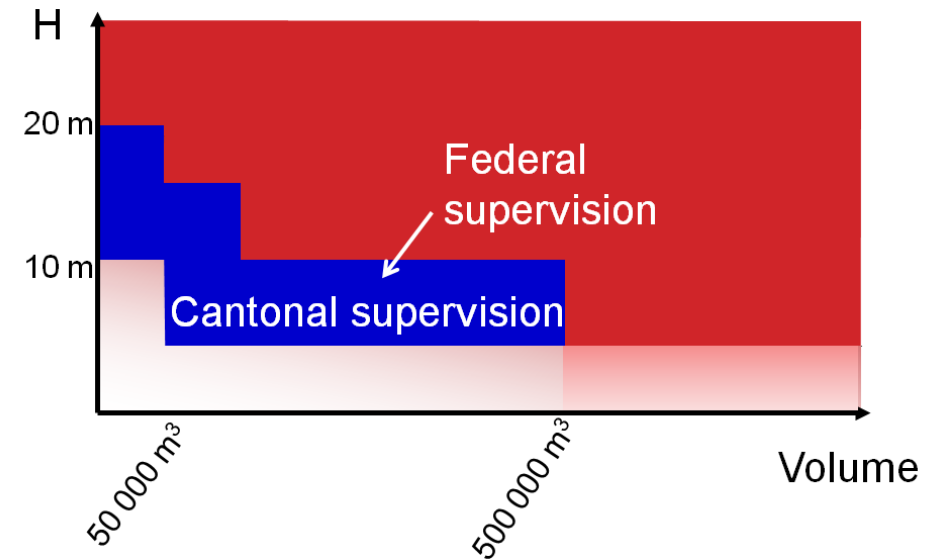
Year of construction of the large dams in Switzerland





## Swiss Concept for Dam Safety

- > The supervision authority depends on the height and on the volume of the reservoir



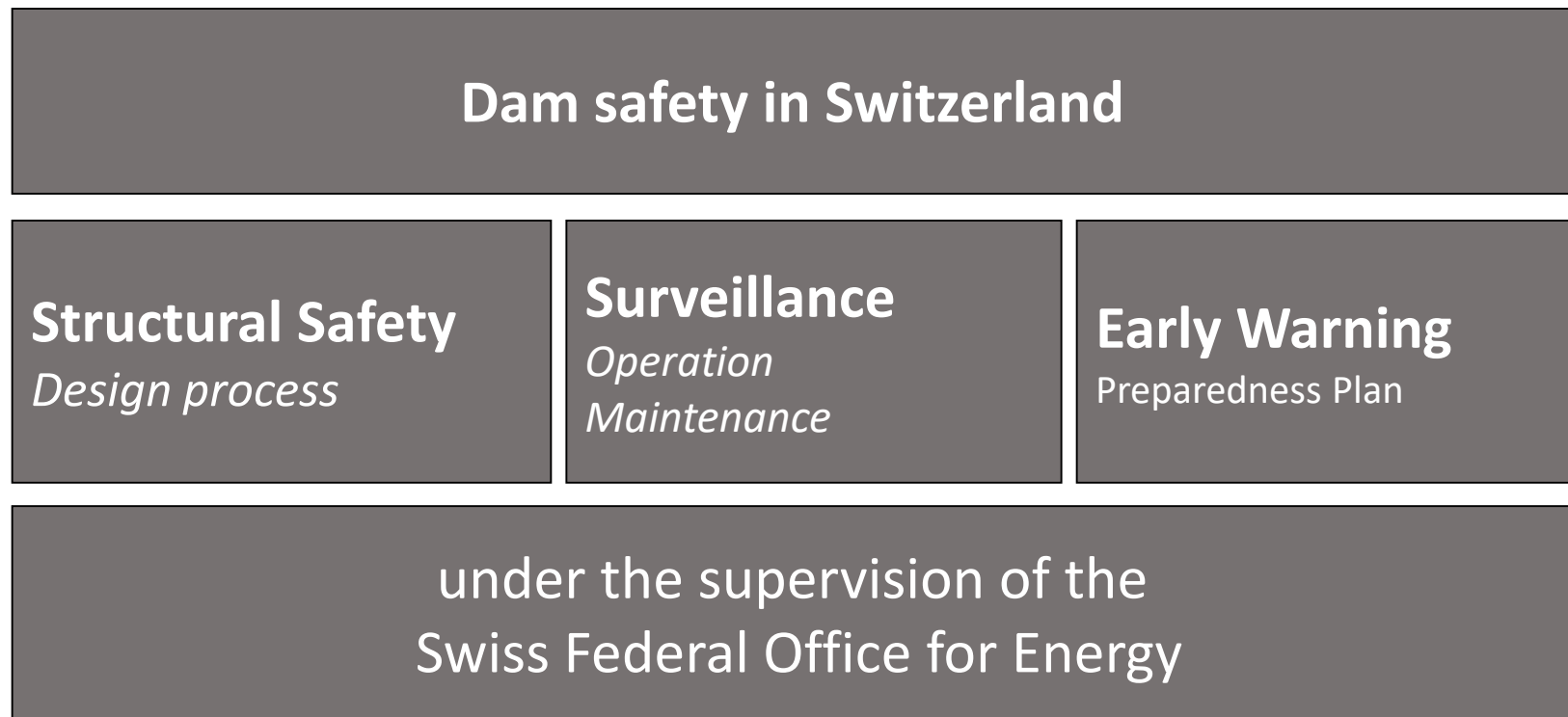
### The same safety concept applies to:

- > All types of dams (embankments, concrete, weirs)
- > All dimensions of dams or reservoirs
- > Dams for any purpose (hydropower, irrigation, water supply, etc.)
- > All operators (private or public)



# Swiss Concept for Dam Safety

> The dam safety is based on 3 main pillars :

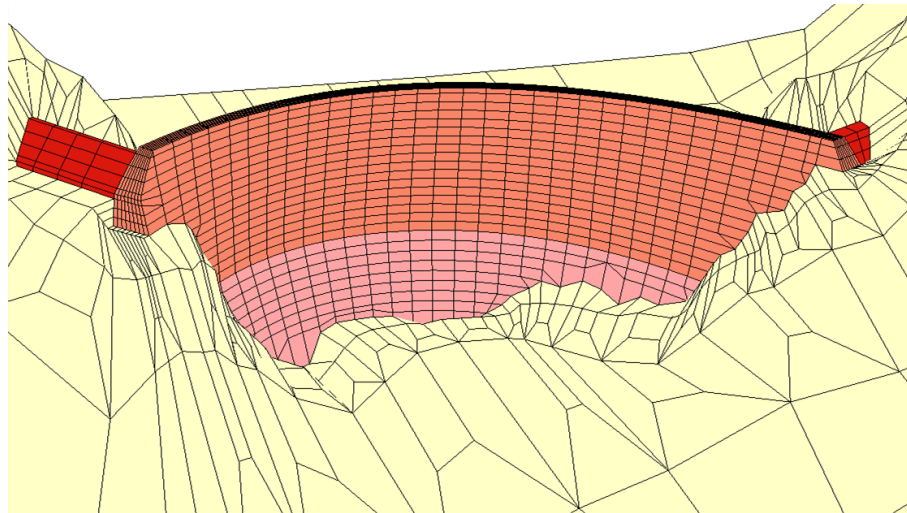




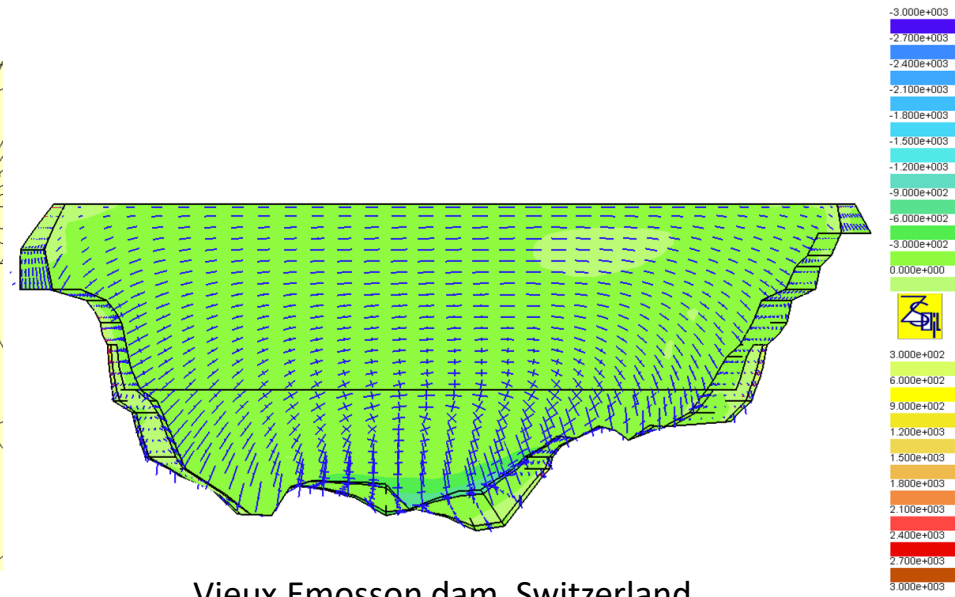
# Swiss Concept for Dam Safety

## Pillar I, Structural Safety : Design Process

- > Design criteria are defined in accordance with the state-of-the-art, taking into account the evolution of knowledge
- > Recommendation about design criteria and methodologies are edited by the Swiss Federal Office For Energy (SFOE), for example for the use of 3D numerical model for the large arch dams



Vieux Emosson dam, Switzerland  
FE Mesh, view from downstream

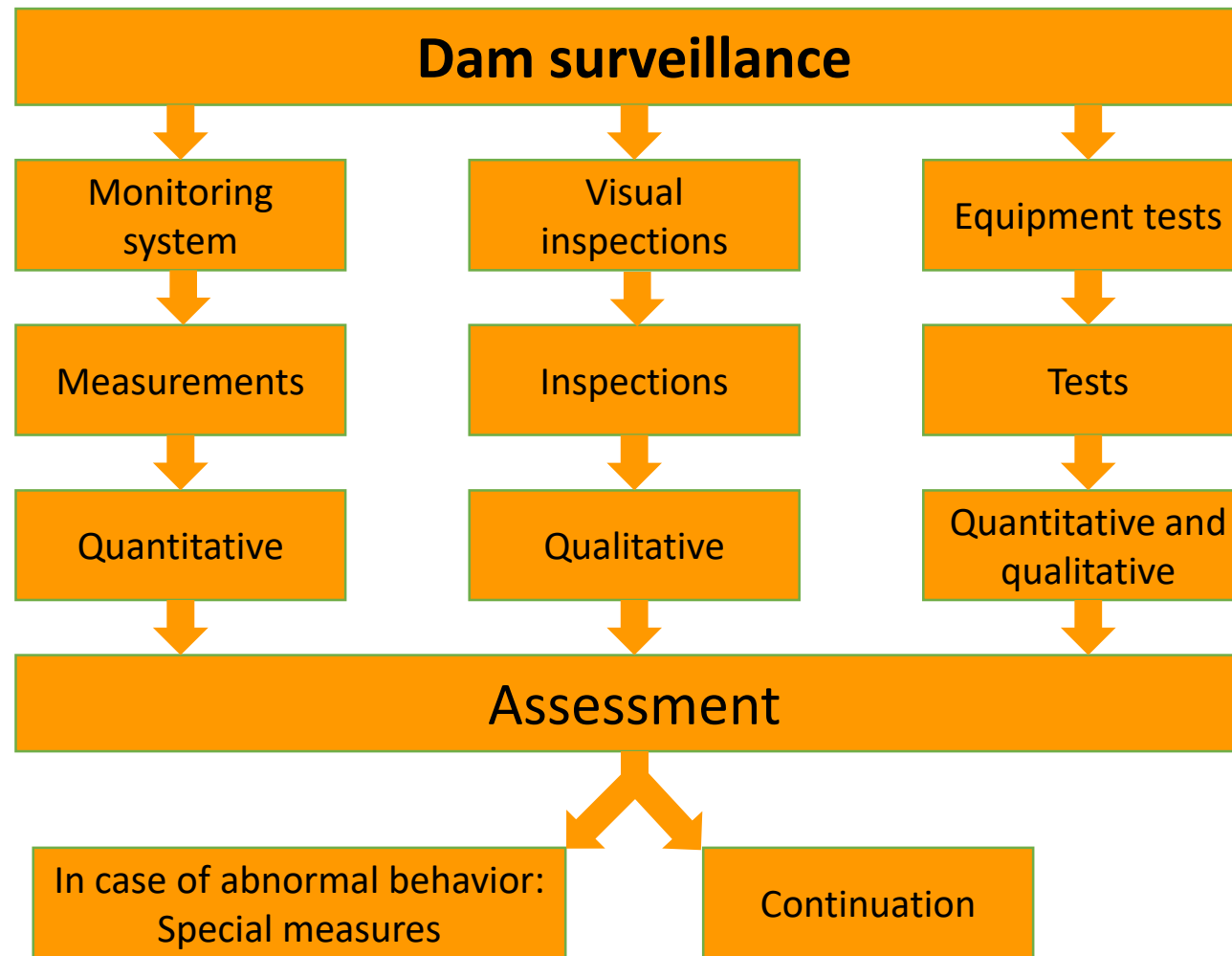


Vieux Emosson dam, Switzerland  
Calculation of the principal stresses



# Swiss Concept for Dam Safety

## Pillar II, Surveillance: Operation Maintenance

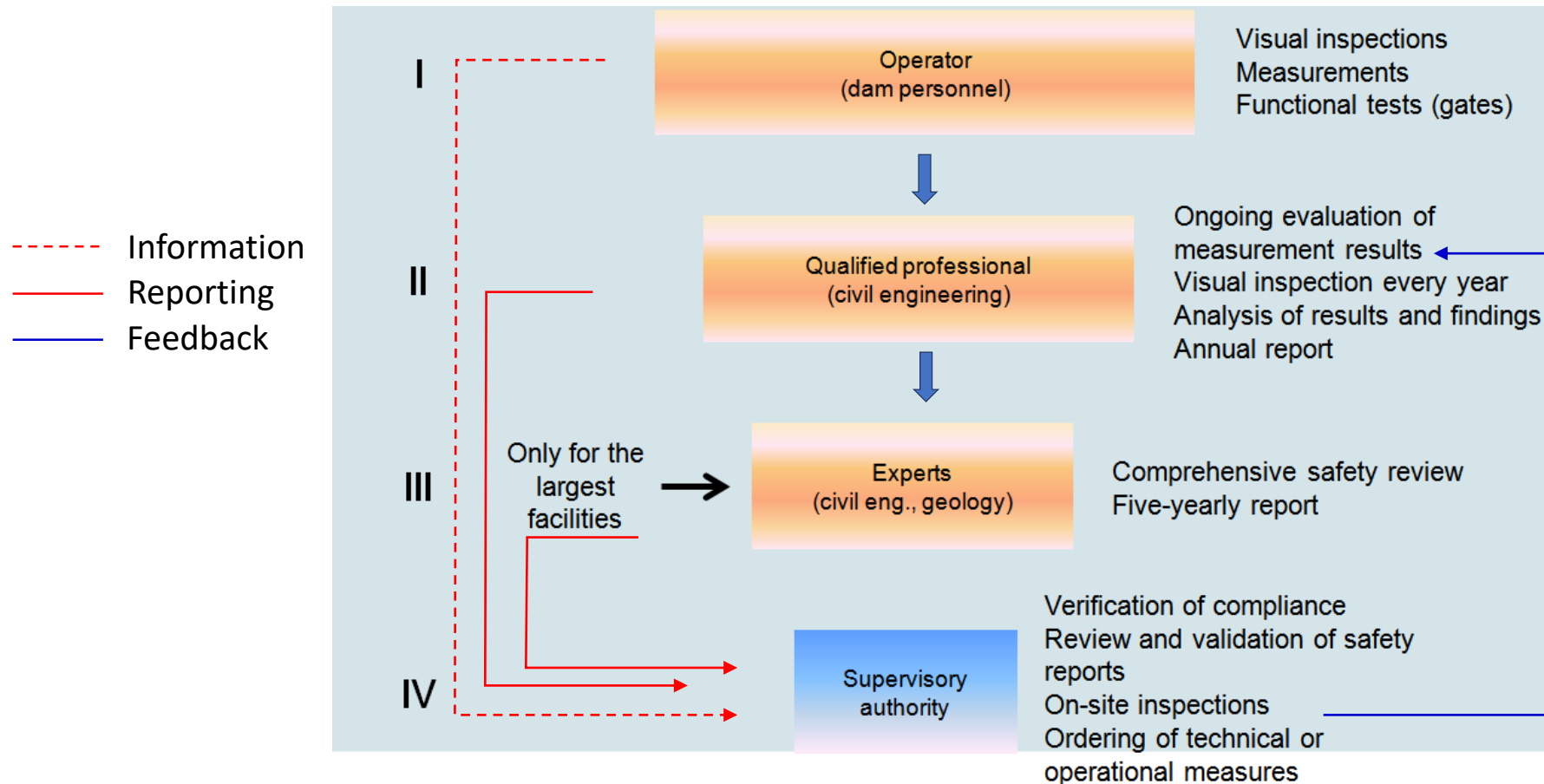




# Swiss Concept for Dam Safety

## Pillar II, Surveillance: Operation Maintenance

### > Dam Surveillance Organization

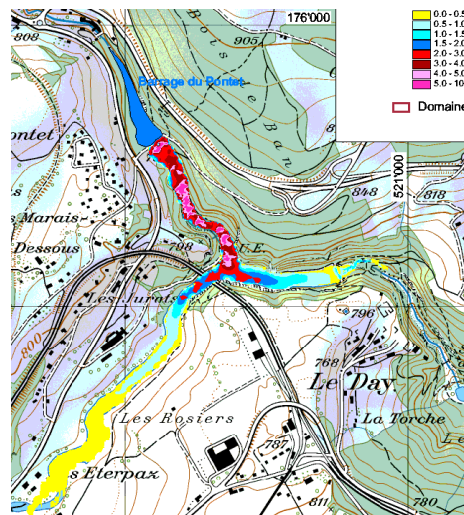




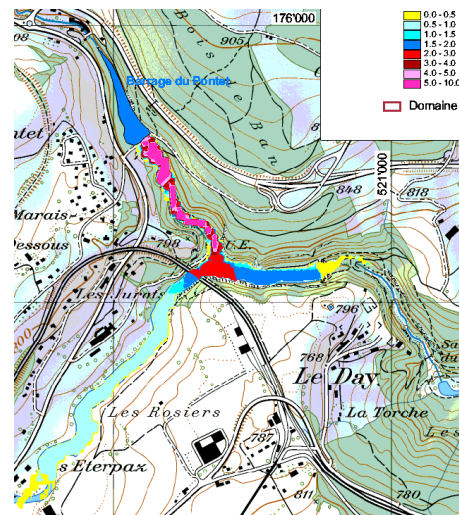
# Swiss Concept for Dam Safety

## Pillar III, Early Warning and Preparedness Plan

- > Preparation for residual risk which is a 3 levels strategy:
  - Flood Mapping: to identify the zones subject to residual risk
  - Early Warning: to inform the population of a risk
  - Preparedness Plan: to ensure readiness of the authorities and the population in case of event.

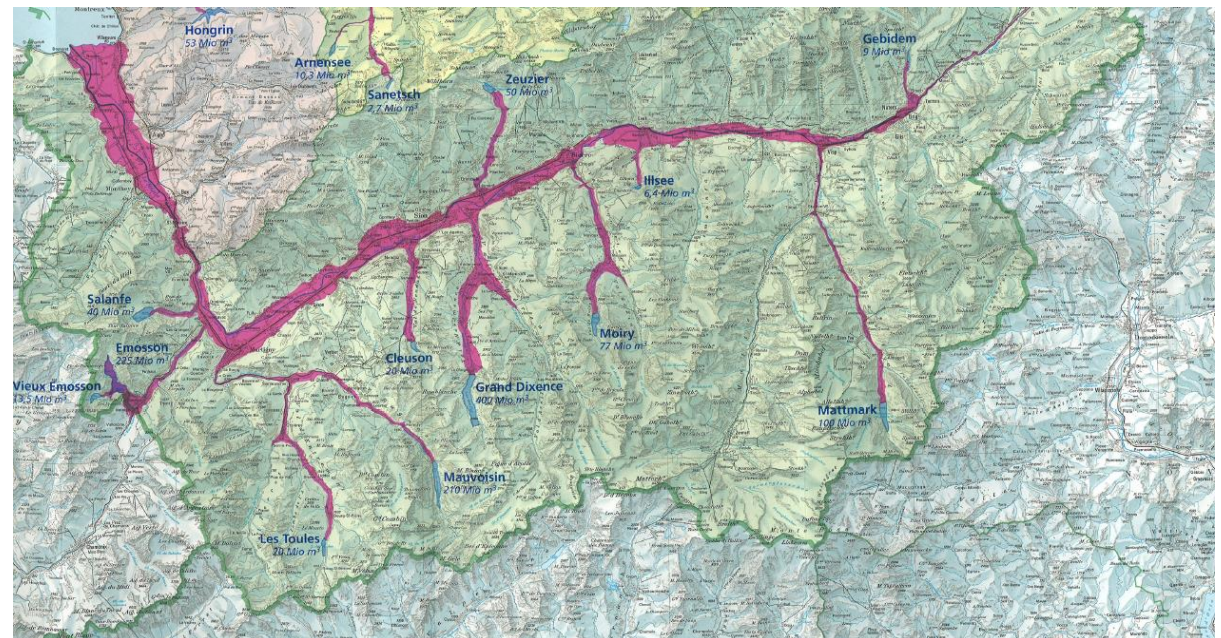


velocities (m/s)



water height (m)

Example of the dam break flood of Le Pontet dam in Switzerland





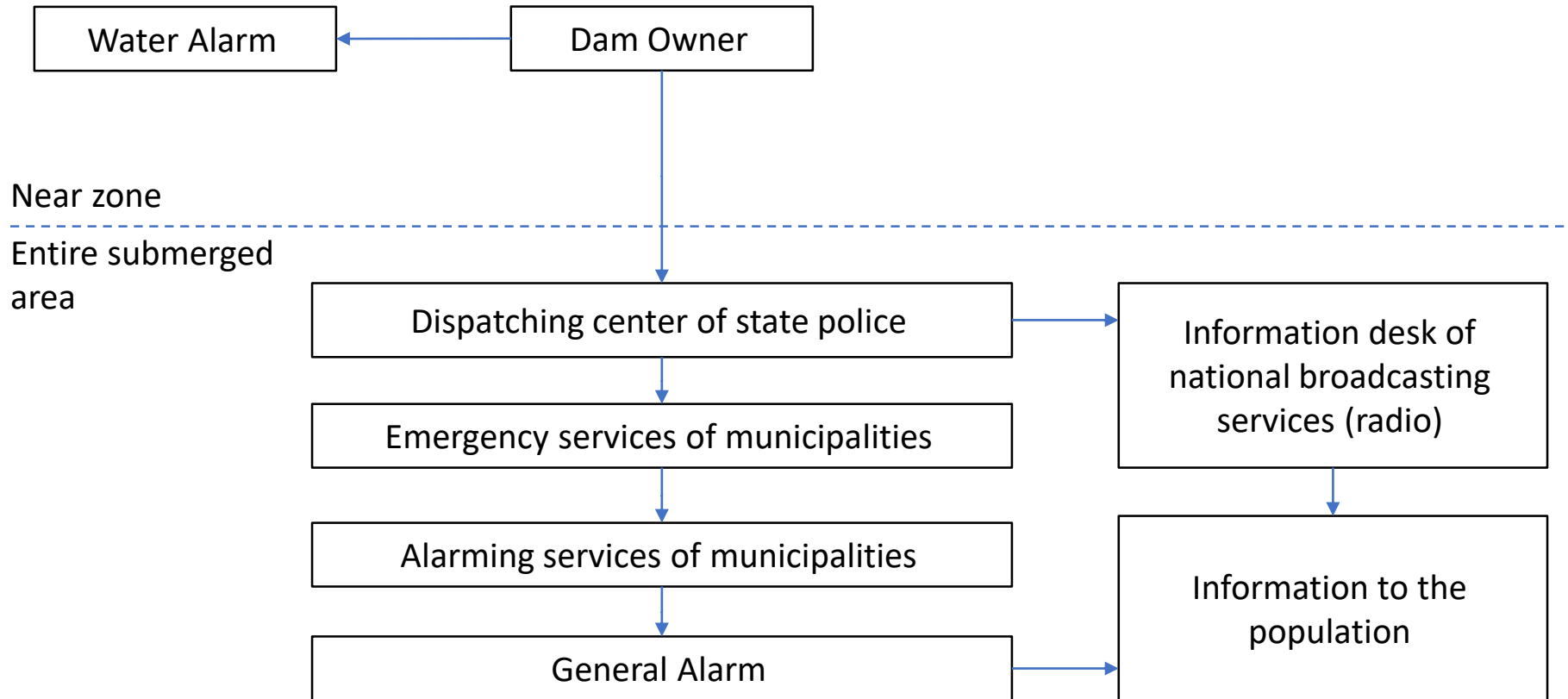


# Swiss Concept for Dam Safety

## Pillar III, Early Warning and Preparedness Plan

### > Alarm System

For volume > 2 million m<sup>3</sup>





Thank you for your attention

**stucky**   
a Gruner company

