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Risk analysis of dams: French practice through Safety Review Risk Assessment Conclusion

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The contribution of the risk analysis to dam safety in France

Risk analyses carried out through Safety Review Risk Assessments in France have had major positive impacts on dam safety:

- A new multi-skill functional approach that goes beyond the traditional “Civil engineering” approach
- A notable improvement in the general and exhaustive knowledge of structures
- An identification and inter-classification of the major failure scenarios and safety risks
- An effective reduction of these risks by implementing actions that might be undertaken following a Safety Review Risk Assessment, with the adoption of a preventive posture



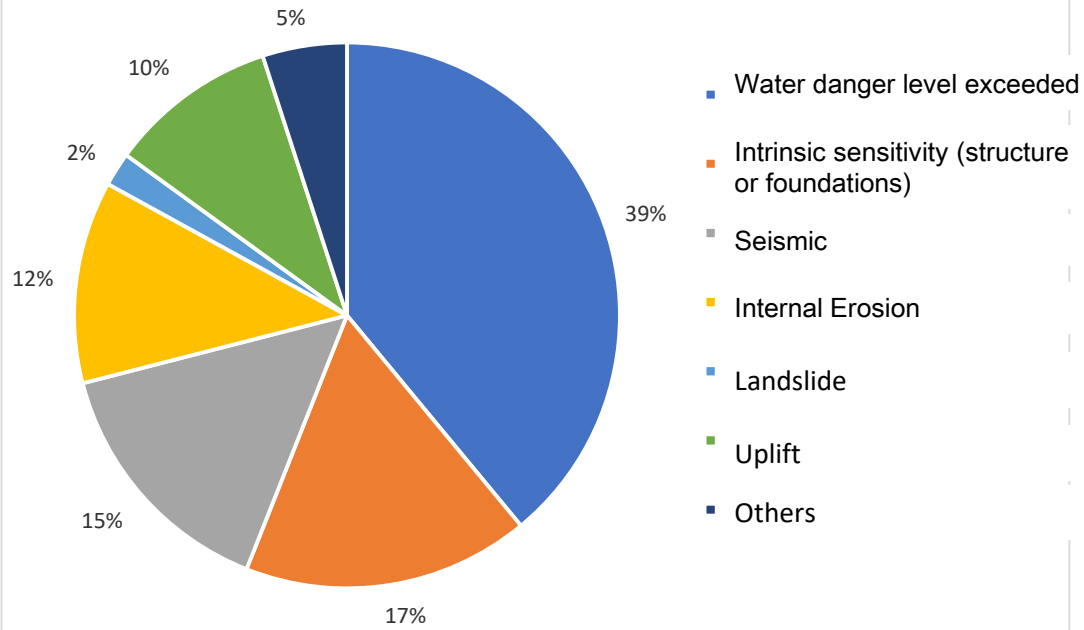
A focus on the identification and inter-classification of risks

Main lessons :

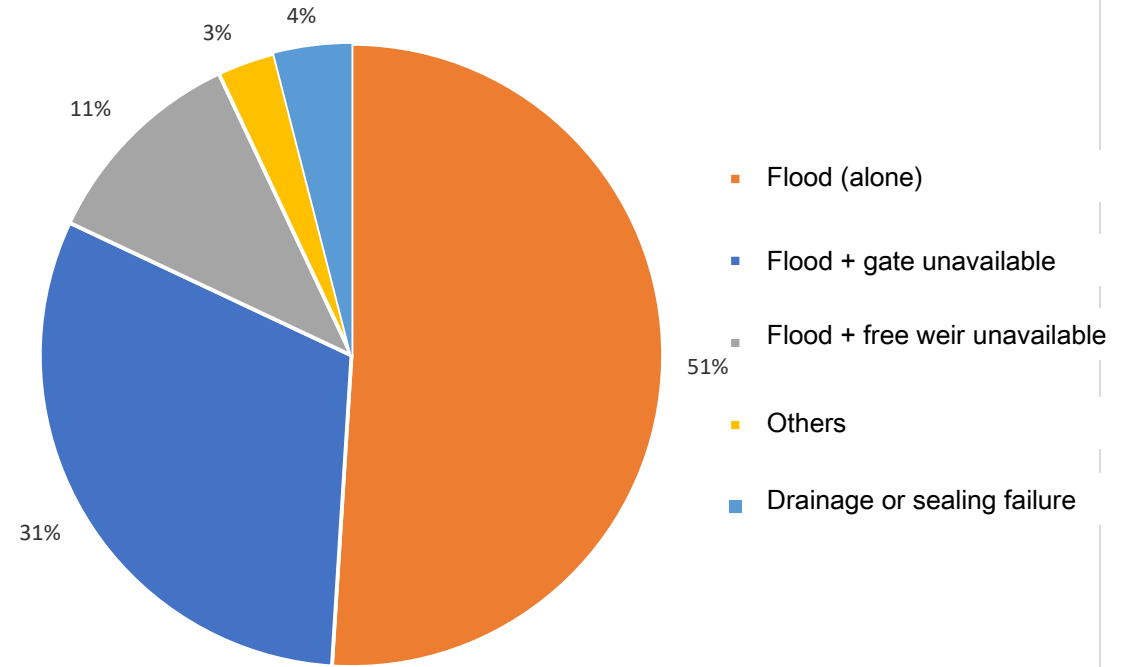
- **Identification of new risks**
Attention usually given to civil engineering has been extended to the hydro-mechanical and control system aspects
- **A new prioritization of risks**
A tool to inter-compare and, finally, inter-classify the structure's main safety risks as objectively as possible
- **Notions of danger levels or situations**
The notion of a failure threshold water level has become an essential indicator of dam safety
- **An effort to identify incidents and accidents to be continued**
The carrying out of Safety Review Risk Assessments has therefore highlighted the need to collect information on accidentology



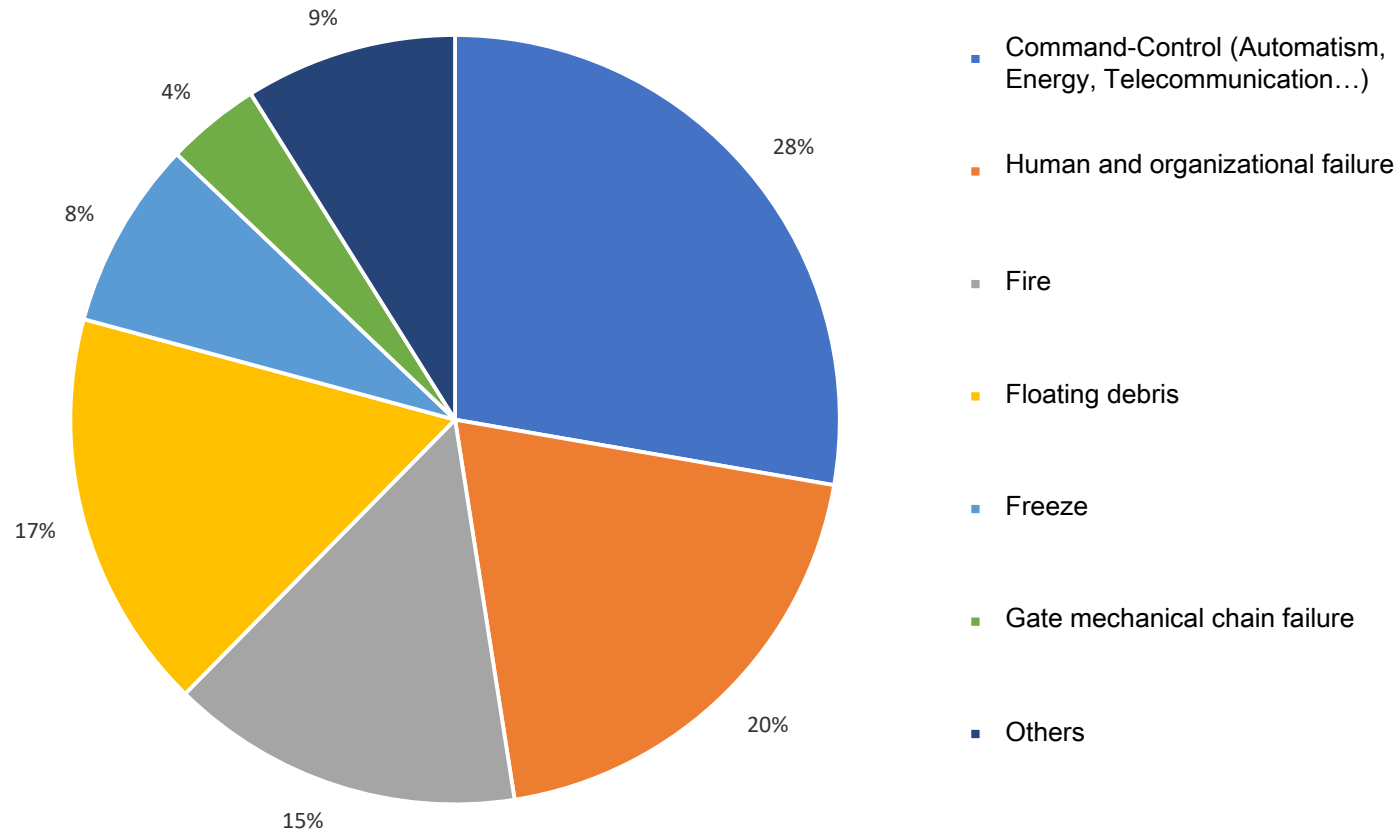
Possible causes of dam failure



Possible causes of water danger level exceeded



Possible causes of gate unavailability



Safety Review Risk Assessment-related communication

For the public :

- The regulations include in the standardized content of Safety Review Risk Assessments a non-technical summary intended for external communication
- Safety Review Risk Assessments can be consulted (in a limited context) on request to the regional authority of the State

Internally to the owner :

- a tool for communicating to all the stakeholders concerned on the safety of dams
- constitutes an excellent opportunity to raise awareness among the safety-related personnel
- an excellent aid for new employees arriving on the scheme for understanding the general operation of a structure, the associated risks and the corresponding risk control measures



To conclude, the Safety Review Risk Assessment is now an essential document in France to demonstrate the dam safety.

- **Around 600 SaRRA done**
- **189 owners**
- **23 consultants approved by the State**

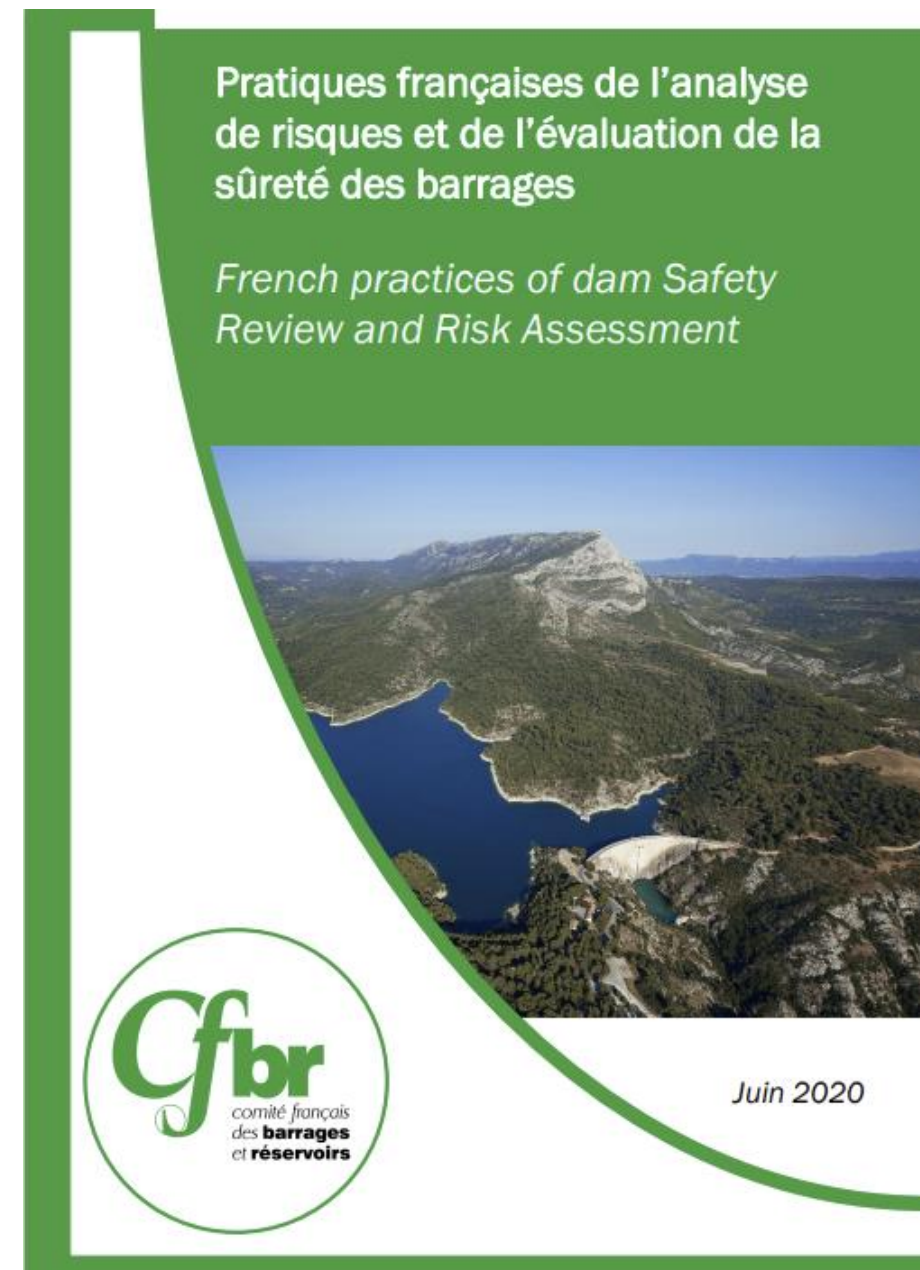
And a new generation of SaRRA planned for this decade with a new regulation:

- **For SaRRA :**
 - a full and systematic diagnosis of the structures and equipment requested prior to the risk analysis
 - a better assessment of the risks during the operational phases
 - provision of flood waves in a 1/25000 format
 - a mandatory evaluation of the ultimate safety of dams
- **Minimum safety requirements to be checked in SaRRA (flood, seismic, gate failure scenario...)**



For further information:

https://www.barrages-cfbr.eu/IMG/pdf/fr-en_recommandations_cfbr_2021_analyse_de_risques.pdf



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