Risk Identification and Mitigation through Surveillance and Monitoring

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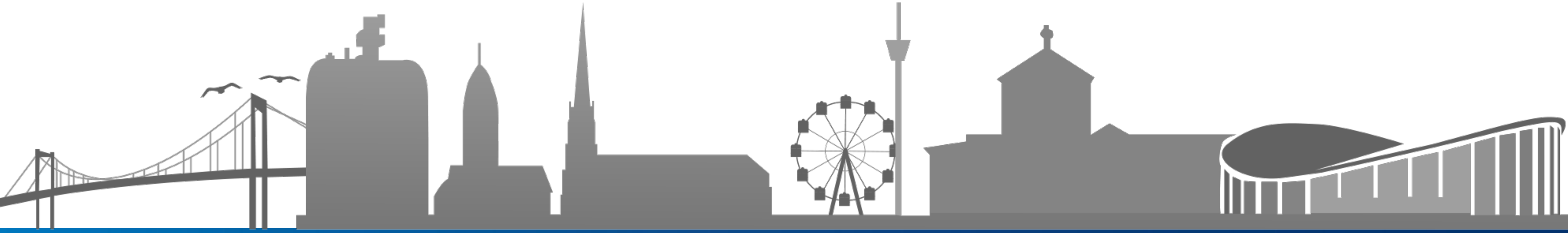
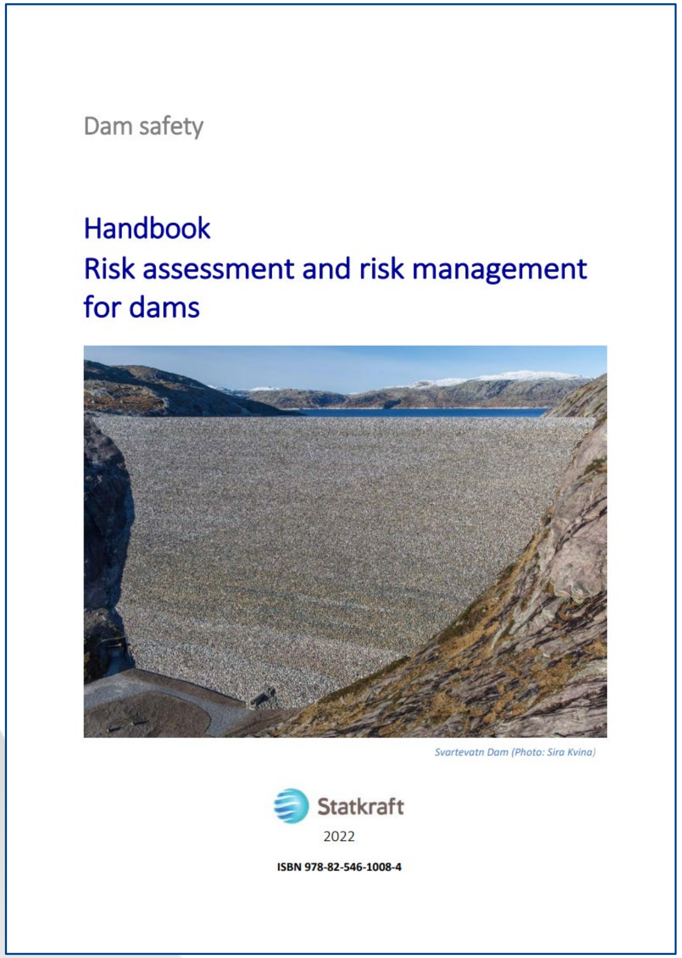


Risk Informed Decision Making


Dam safety

Handbook
Risk assessment and risk management for dams

Svartevatn Dam (Photo: Sira Kvina)

Statkraft
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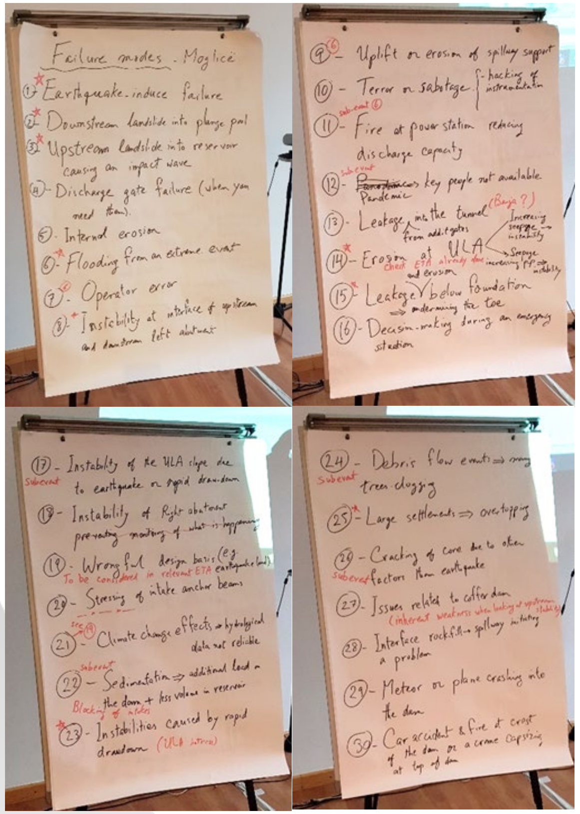
Dam Safety Risk Assessment Workshop, Tirana 2021



Probability	Verbal description
~0.0 – 0.5% (mean: 0.1%)	**Virtually impossible,** due to known physical conditions or process that can be described and specified with almost complete confidence
0.5 – 2% (mean: 1%)	**Very unlikely,** although the possibility cannot be ruled out on the basis of physical or other reasons
2 – 33% (mean: 10%)	**Unlikely,** but it could happen
33 – 67% (mean: 50%)	**As likely as not (unknown)** with no reason to believe that one possibility is more or less likely than the other
67 – 98% (mean: 90%)	**Likely,** but it may not happen
98 – 99.5% (mean: 99%)	**Very likely,** but not completely certain
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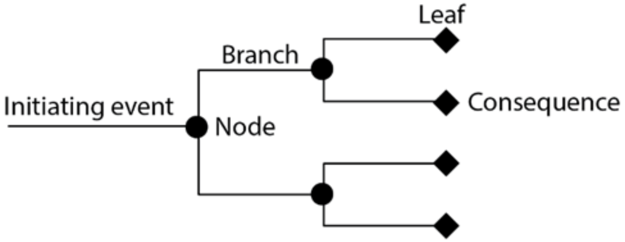
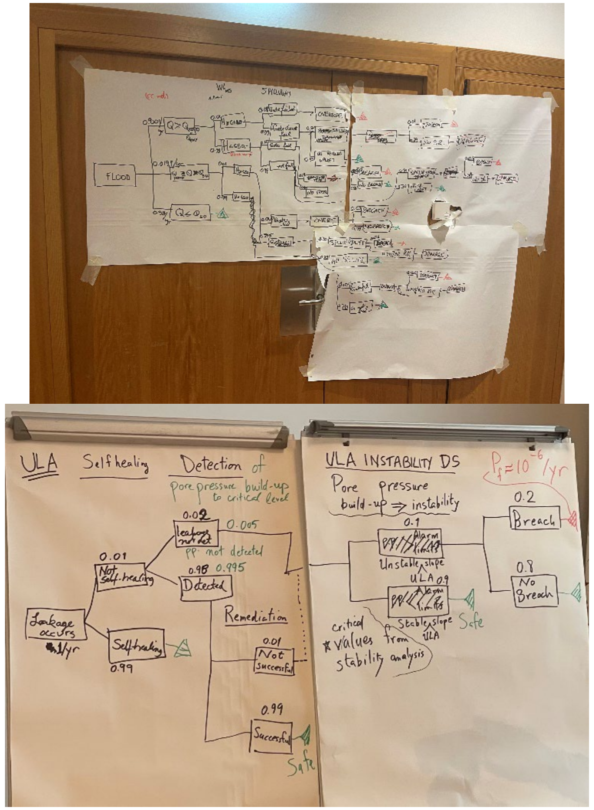
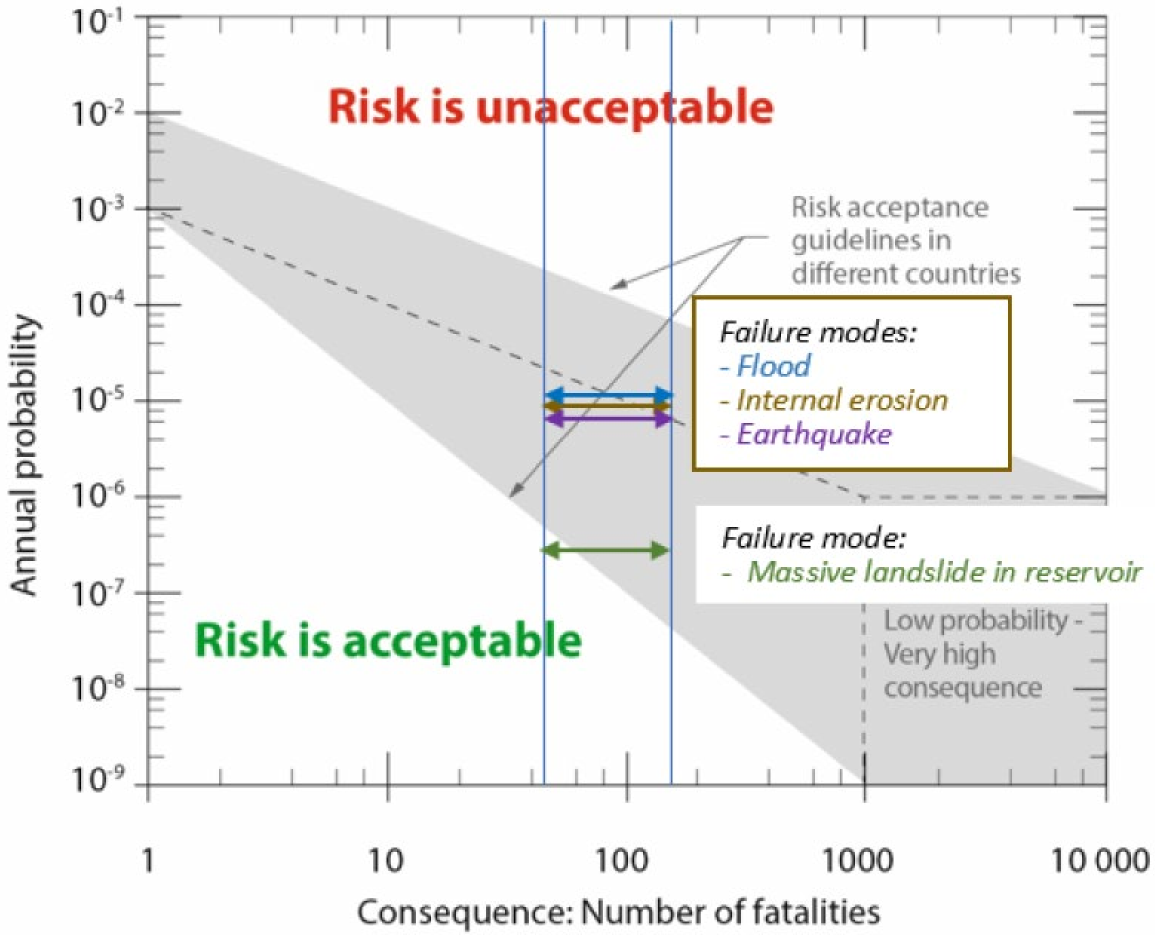




Results from Event Tree Analyses



Trigger	Annual Failure Probability
Earthquake	8.6×10^{-6}
Flood	1.1×10^{-5}
Internal Erosion	8.0×10^{-6}
Landslide in Reservoir	2.3×10^{-7}

ETA Results for Moglice Dam

Update of the Dam Safety Program in Albania

- Moglice dam is now into the third year of operation
- The initial phase of operations post impoundment was complete
- Opportunity to revisit how the dam safety program was delivered
  - Structure of local team
  - Monitoring Instrumentation
  - Frequency of Measurements/Inspections

Event Tree Analysis for Risk Informed Decisions

Probability	Verbal description
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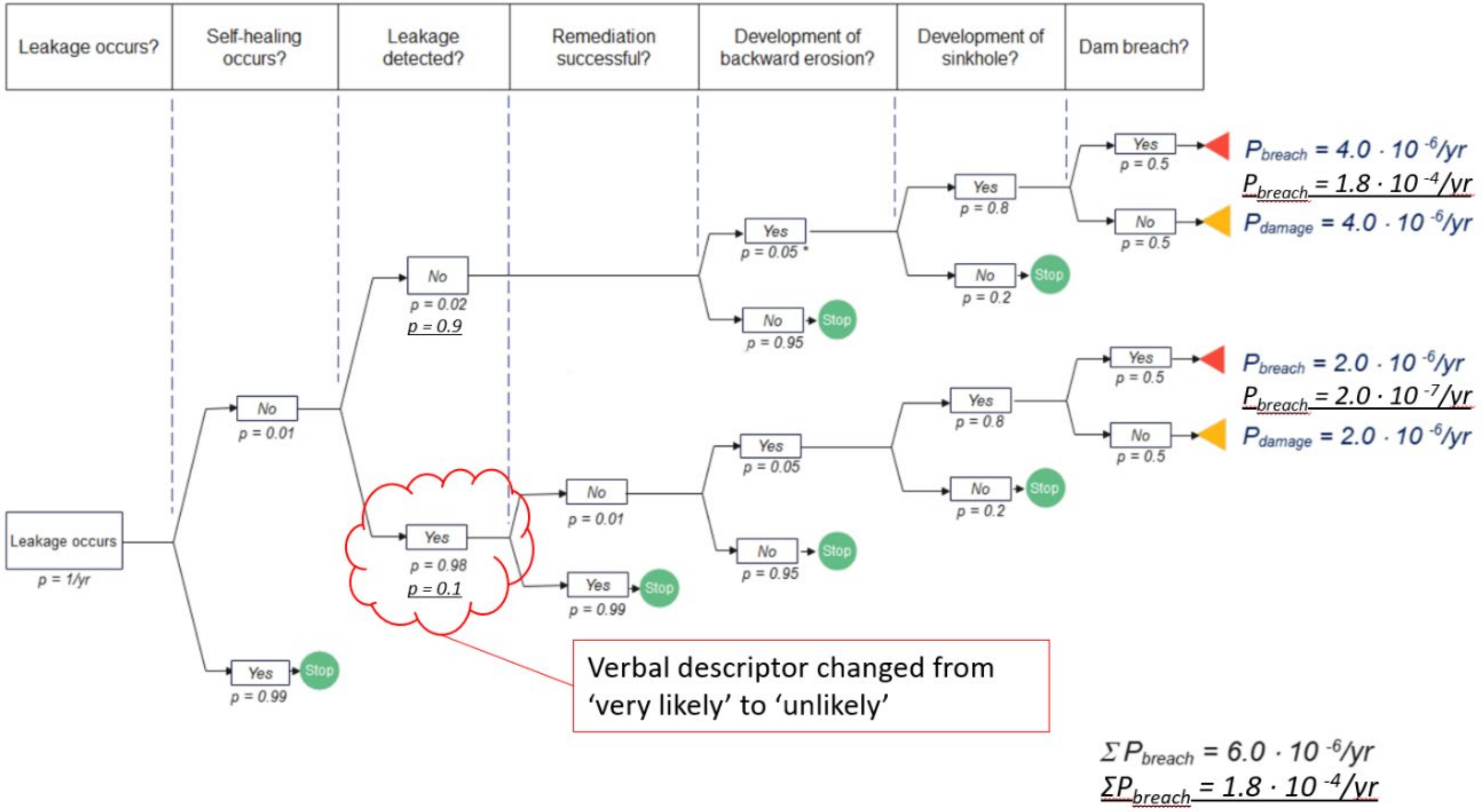

Conclusion

- Clear benefit to both management and O&M teams in compiling a comprehensive quantitative risk assessment for dam safety.
- At a local level, when delivering the surveillance and monitoring program a quantitative risk assessment provides useful information especially when resourcing the dam safety team and developing the inspection and measurement schedules.

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