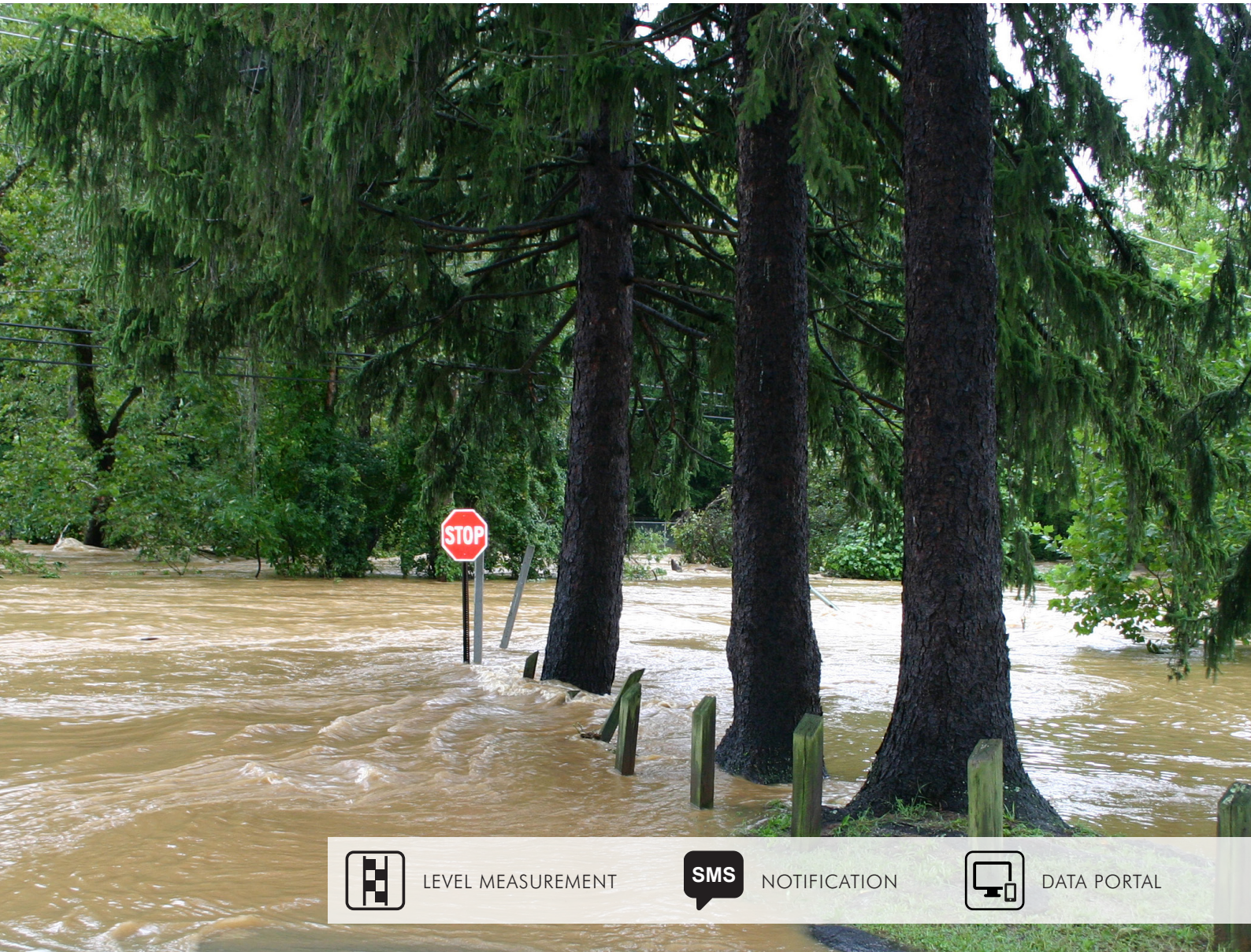


FLOOD ALARM SYSTEM RHINE REGULATION CANAL



LEVEL MEASUREMENT



NOTIFICATION



DATA PORTAL

Integrated flood alarm system with automatic alerting and control centre for all stations in the catchment area of the Rhine regulation channel.



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Title Page: Flooded Rhine Valley.

Figure 1: Pictures of a tributary: A small creek at low tide (left) and being filled up during a heavy precipitation event (right).

CHALLENGE

The Rhine Regulation canal is a 35 km long canal at the Swiss/Austrian border that provides flood protection for the previously frequently flooded Rhine Valley. Due to the age of the structure, increasing population density of the Plains and today's higher flood protection standards, a number of adjustments were necessary. In terms of emergency preparedness and response, the canal operator requested a «virtual situation centre» that combines all gauging and discharge measurement stations in an online portal including alert functionality connected to their own emergency services. In addition, further gauge stations were required for the extension of the measurement network.

SOLUTION

The Geoprevent online data portal offers the ideal platform for the requested «virtual situation centre» and combined display of measurement, warning and alarm values. Authorized users can access all data at any time via PC, tablet or smartphone and gain an overview of all measurement stations. This allows convenient remote monitoring of the canal and its tributaries including automatically recorded webcam imagery. We upgraded

the alarm issuing stations to ensure redundant level measurement, alarm transmission and simultaneously forwarding the alerts to the local emergency centre (via TUS and Certas modules). Compared to conventional monitoring systems, alarm systems require higher system availability; certain components must be duplicated, e.g. two different measurement sensors per station, a charge controller and a battery for reliable power supply in the event of a power failure as well as an integrated cabinet heater for optimum operating conditions in the cold season. The measurement sensors applied include gauge radars, pressure probes and ultrasonic sensors. Data is transmitted via mobile radio and a DSL connection. In addition, the online data portal offers the option of sending automatic notifications to user-editable lists when a predefined gauge value is exceeded at a certain measurement station. Different levels were defined; pre-alarm, alarm, population alert and all-clear. Whereas the emergency response teams are notified at all alert levels, the population can sign up to a dedicated population alert list and receive automatic notifications when this level is exceeded. Another feature is the integration of the rain radar of the national weather service.

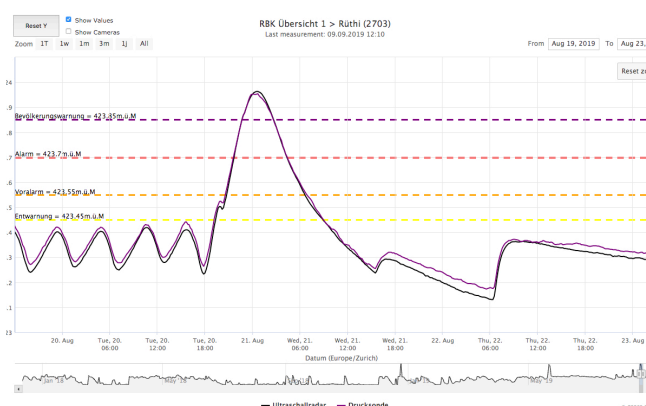


Figure 2: Station view in the online data portal where all alarm thresholds were exceeded (the lowest level is for the all-clear after a flood event).



Figure 3: A gauge radar is mounted underneath a pedestrian bridge.