



Stationary discharge measurement in Saxony at the Zschopau River

2 OTT SLD & LogoSens 2



Background

The measurement station Kriebstein UP has been set up in 1932 as downstream gauge at the Kriebstein dam at the Zschopau River. As flood-warning station and hydrometric base station with a catchment basin of 1754 km², reliable data monitoring is extremely important for the hydrological balance of Freiberg and for the whole area around the Mulde.

Monitoring Task

Discharge monitoring in flood situations had always been a problem at this gauging station. There is solid knowledge, proven by measurements about the water level/discharge relation for low and average water levels. Though, the realization of comparative discharge measurements in floodwater was always difficult as there are waterpower plants up-and downstream of the gauging station which influence the water level with their behaviour.

Monitoring Solution

During the years 2010 / 2011 the gauging station has been systematically reconstructed and it was decided to install a stationary discharge measurement system. For the first calibration and for a founded selection of the measuring location a model calculation has been made. As it was consequently recommended, the gauging station was designed as 2-path-system.

In 2011, 2 OTT SLD units with 600 KHz and 1 MHz were installed. They are operated via an OTT LogoSens 2

with data recall as 15 minute average value via the conventional telephone network. A small buffer battery will bypass short term power failure.



The gauging station under reconstruction. The carriers for the two SLDs can be clearly seen in the drained channel

The sensor of the lower measuring path was installed vertically adjustable on a double-T-carrier, the upper sensor was fixed to a concrete foundation on the slope.



Mounted sensor of the upper measuring path with lockable protection cover.

Summary

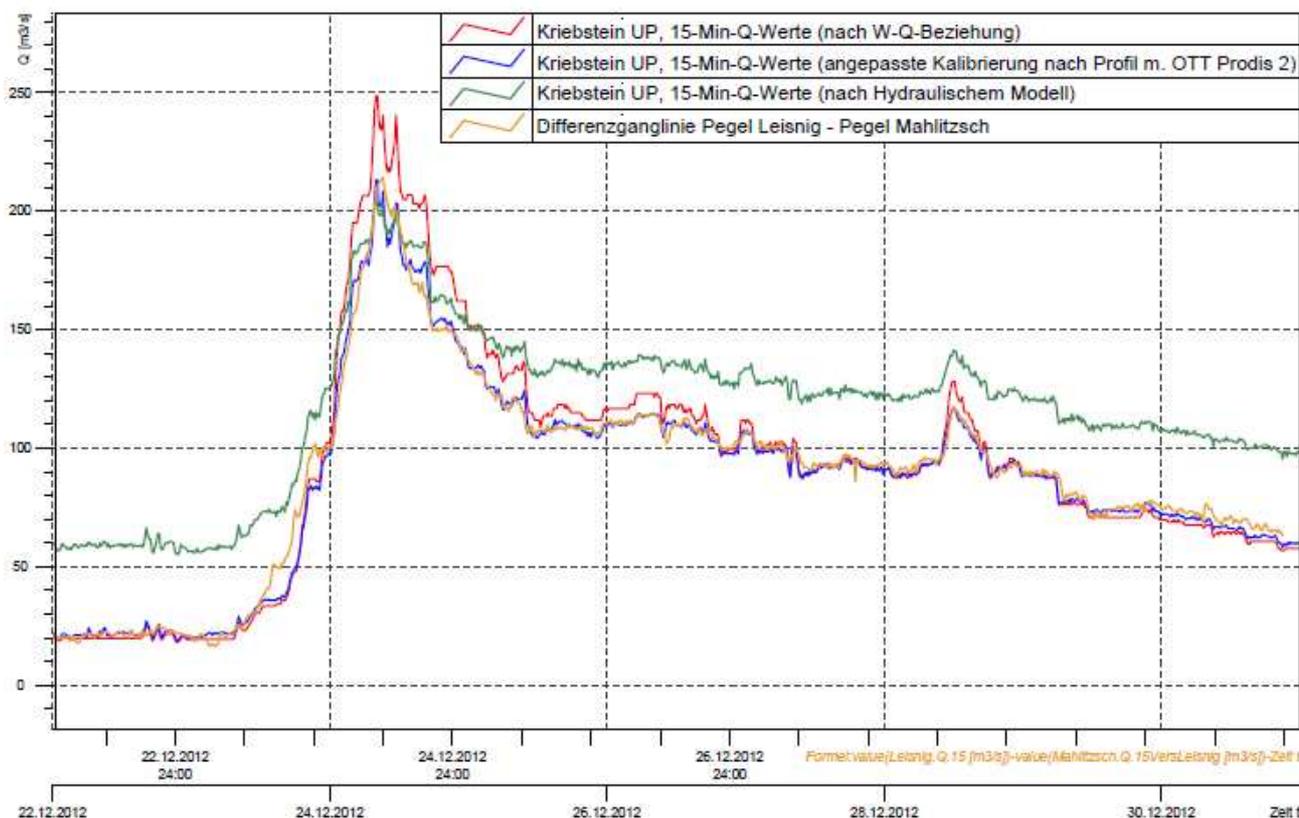
Flood Event 2012

The performance of the system during the first flood event after the reconstruction came up to the high expectations that were set in the installation.

Two hydrographs were logged. One of them corresponding to the calibration based on the calculation of the hydraulic model (green curve), the second corresponding to a provisional calibration based on the stream profile and existing measurement data (blue curve).

A third hydrograph which was recorded in a longitudinal section provided two findings:

- The theoretically established water level/discharge relation is erroneous in the upper range.
- The hydrographs of the two calibrations approach each other in the high water range, however, in the average water range the model calibration does not provide valuable data; due to the inaccuracies of the stream profile there are major absolute deviations.



Discharge hydrographs at the gauging station Kriebstein UP during the flood event in December 2012, according to water level/discharge relation, OTT SLD-system (various calibrations) and longitudinal section comparison.

Damage in flood event in June 2013 and repair

During the high water in the Zschopau River in June 2013, the carrier of the lower sensor was damaged by flotsam. The sensor could not provide reliable data anymore. At the moment the discharge values are being reconstructed on the basis of the measurements of the upper sensor.

Die Befestigung beider Sensoren wurde noch einmal professionell durch einen externen Dienstleister (HydroTec Berlin GmbH) überarbeitet, so dass der Betreiber bei künftigen Hochwässern wieder auf zuverlässige Daten zurückgreifen kann



Rebuilt carrier of the lower measurement path with deflector

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