SHARD

Structural Health Monitoring

Next generation of Structure Health Monitoring

Real–time structural health monitoring

SHARD is a web based application to monitor the structural health. PSAs calculated in real-time are compared with response spectra given in design codes as the EC, NEHRP or DIN codes. Exceedance is checked and warning incidents are issued. In addition to the spectral comparison also data quality as delay and variance is tracked and quality incidence are generated. The build in incident browser allows a quick and easy access to incident history showing data quality, exceedance and earthquake occurance. Incidents are displayed in a so called heat map giving an instant overview.

FEATURES

- Real-time calculation of response spectra

- Monitoring of response spectra exceedance

- Quality and exceedance incident browser

- Connectivity to earthquake report service

- Earthquake report generation

- Multi structure support

- Web based application

Status information

The map and the picture on the left side of SHARD show building and sensor locations and status. The table on the lower left side gives information on incidents like data quality problem, reference spectrum exceedance or PGA exceedance. On top latest earthquake and expected arrival time at the structure is shown.
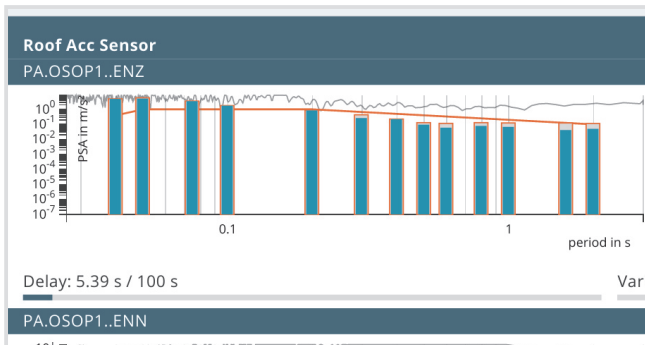
Real–time PSA exceedance

Response spectra with 5% damping are calculated in real-time and compared with spectra derived from national design codes as for example EC8 or IBC2000. Any other building code can be implemented. In addition FFT-spectra and waveforms are shown. Incidents are generated in case of spectral or threshold exceedance.
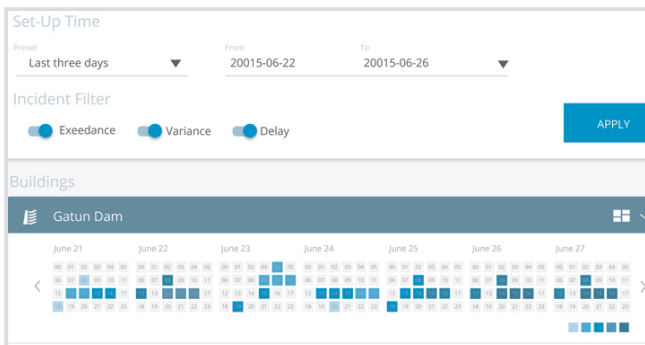
Incident heat map

The incident heat map gives an instant overview to the occurance history of earthquakes, exceedances and data quality. The intensity of the color correlates with the number of incidents in the time interval. The higher the number of incidents the higher the intensity of the color.

TECHNOLOGY

gempa GmbH offers a strong motion processing package fulfilling the task of real-time structural health monitoring. It calculates pseudo-acceleration responses for configurable frequencies given by design codes and checks the exceedance. Also threshold exceedance of PGA/PGV/PGD for different notification levels as info, watch, alert and warning. Through the use of CAPS (Common Acquisition Protocol Server) and additional plugins also the calculation of drift ratios is supported. Sensor data quality is monitored by analyzing data delay and data root mean square values.

Earthquake solutions from various sources can be imported through the Quakelink server.

SHARD also comes with an earthquake reporting engine giving the most important earthquake engineering parameter as
- PGA/PGV/PGD
- Root-mean-square (RMS) of acc., vel. and dis.
- Arias (Ia) and characteristic (Ic) intensities
- Arias duration
- Cumulative Absolute Velocity (CAV)
- Specific Energy Density (SED)
- Effective design acceleration (EDA)
- Predominant (Tp) and mean (Tm) periods
- Response spectra

As the reports are template based, they are highly customizable supporting different layouts and languages.