

SEISMIC INSTRUMENTATION FOR NPP – AN INTERPRETATIVE REVIEW OF CURRENT PRACTICE AND THE RELATED STANDARD IN GERMANY

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SUMMARY

The German nuclear safety standard KTA 2201: "Design of nuclear power plants against seismic events" consists of the following parts:

1. Basic principles.
2. Characteristic data on seismic input.
3. Design of structures.
4. Design of machinery and electrical equipment.
5. Seismic instrumentation.
6. Post-seismic operation.

While part 1 was approved by the German Nuclear Standards Commission (KTA) in June 1975, part 5 was issued for public comment in November 1976. The other parts are still under development. Part 5 of the standard deals specifically with requirements for a seismic instrumentation which is based on the recording of accelerations so that it is possible to establish whether or not the design parameters of the Design Earthquake are exceeded and to get reliable data for a numerical check up. The standard applies to all stationary NPPs and should be analogously applied to all other nuclear facilities.

In detail the requirements of the standard concern:

- number and location (number and location of acceleration recording systems for different sites, single-block plants and multi-block plants);
- characteristic of instruments (readiness and operation of instruments, margin of errors, dynamic and operation characteristics, duration of records, seismic switch);
- triggering and information (loss of electric power, start of the acceleration recording systems, threshold of acceleration for triggers and seismic switches, optic and acoustic information);
- documentation (results of recordings, inspection and tests).

With exception of the U.S. guidelines there can be found no detailed requirements for these aspects.

The purpose of this paper is to present the standard KTA 2201, part 5 with its philosophy in detail and in comparison with corresponding requirements in other countries such as the USNRC Regulatory Guide 1.12 or the requirements in the IAEA draft.

It will be shown that by a relative small number of instruments which are to be very reliable in operation and triggering an optimum of data may be available after an earthquake.