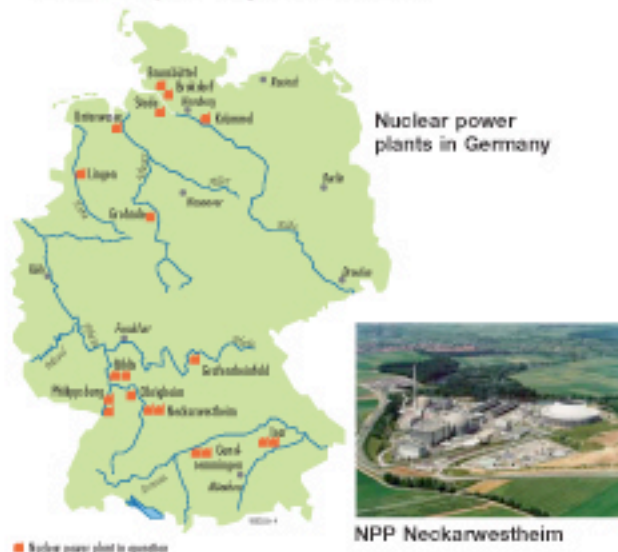


Statistical Evaluation of Reported Events (1)

(G. Farber, H. Matthes)

> The story behind

- 19 NPPs in operation (13 PWRs, 6 BWRs)
- events to be reported according to safety criteria
- appr. 125 events per year in total
- long-term GRS experience concerning case by case in-depth analyses of events

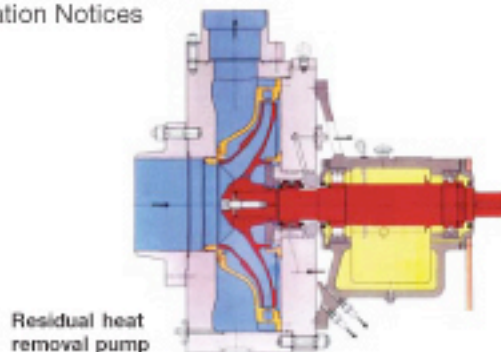


> The overall objective

In supplement to in-depth analyses provide statistical analyses to **identify plant-specific and generic weaknesses with regard to reactor safety** by means of **frequencies and trends of similar or identical event characteristics**

> The information sources

- Electronic files
- event reports provided by the licensee
 - vendor reports and TUV (technical supervisory organisations) reports
 - technical plant documentation System (TECDO) of GRS
 - entries in other GRS databases
 - Information Notices



> The tool

- ORACLE 8 database consisting of
- comprehensive keyword directories for systematic data input
 - plant condition
 - effected plant equipment
 - event characteristics
 - appr. 3100 keywords
 - hierarchical structure (up to 5 information levels)
 - clear keyword definitions
 - detailed user's manual
 - automatic data consistency check in order to avoid
 - incomplete encoding
 - inadmissible encoding
 - contradictory encoding
 - sophisticated data evaluation model
 - failure-based and event-based
 - any desired „AND“, „AND NOT“ as well as „OR“ combinations of keywords
 - any desired time intervals

Keyword directories

| Main characteristics of the central keyword directory | Number of keywords |
|---|--------------------|
| Operational mode of plant, system and component | 42 |
| System utilization of effected component | 119 |
| Degree of damage (not thought to be the smallest unit under consideration) | 17 |
| Kind of event / failure with regard to component and component sub-unit | 96 |
| Causes of event | 185 |
| Potential causing the event | 7 |
| Kind of event detection | 10 |
| Event / failure and radiological consequences | 30 |
| Measures taken after the event | 41 |
| Safety goal interference and | 76 |
| Classification of event (as of the Nuclear Safety Standards Commission) | 20 |
| Design characteristics and groups of material of the effected/produced parts | 45 |
| Leakage | 12 |
| Failure with reference to aging | 9 |
| Place of installation of the component respectively of the component sub-unit | 10 |
| Results of precursor evaluation | 20 |
| | 685 |

| Additional keyword lists | Number of keywords | |
|---------------------------|---|-------------|
| For systems | Uniform list as used by the utilities (GRS) | 690 |
| For components | Uniform list as used by the utilities (GRS) | 119 |
| For component sub-units | Uniform list as used by the utilities (GRS) | 255 |
| For parts | Elaborated by GRS (still incomplete) | 124 |
| For materials | Elaborated by GRS | 130 |
| For replacement materials | Elaborated by GRS (see above) | 130 |
| | | 2965 |

