DEC
Beyond Design?

Kay Nünighoff, GRS
07.06.2017

Workshop 2, International Conference on Nuclear Installation Safety, IAEA, Vienna
Deterministic Approach to Design a NPP

Beyond Design Basis Accidents (BDBA)

Design Basis Accidents (DBA)

Maximum Credible Accident
# Defence in Depth for Existing Plants

## Operational states

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal operation (NO)</td>
<td>Anticipated Operational Occurrences (AOO)</td>
</tr>
</tbody>
</table>

## Accident conditions

<table>
<thead>
<tr>
<th></th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Design Basis Accidents (DBA)</td>
<td>Design Extension Conditions (DEC)</td>
</tr>
<tr>
<td>Without significant fuel degradation</td>
<td>With core melt</td>
<td></td>
</tr>
</tbody>
</table>

## Systems

- **Limitation Systems**
- **Safety Systems**
- **Preventive AM**
- **Mitigative AM**

- **EOP**
- **SAM G**
## Design Expectations for New NPPs

<table>
<thead>
<tr>
<th>Operational states</th>
<th>Accident conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Normal operation (NO)</td>
<td>Anticipated Operational Occurrences (AOO)</td>
</tr>
</tbody>
</table>

- **Limitation Systems**
- **Safety Systems**
- **Additional Safety features**
- **Complementary Safety features**

---

*Design*
Summary

- There are clear and different expectations for existing and new NPPs
  - Accident management versus engineered safety features

- Is the term DBA still reasonable, if we talk about new plants?

- Shall we talk about DEC if we talk about new plants?

- What is the meaning of EOPs and SAMGs for new NPPs?