Survey Requirements of Transport and Storage Casks Manufacturing for Interim Storage in Switzerland

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SVTI - Swiss Association for Technical Inspections

Nuclear Inspectorate
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## Actual Cask Situation in CH

<table>
<thead>
<tr>
<th>Design/Typ</th>
<th>Quantity</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TN24G/GB</td>
<td>PWR</td>
<td>7+1</td>
</tr>
<tr>
<td>TN24BH/BHL</td>
<td>BWR</td>
<td>19+22</td>
</tr>
<tr>
<td>TN97L</td>
<td>BWR</td>
<td>9</td>
</tr>
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<td>TN52L</td>
<td>BWR</td>
<td>1</td>
</tr>
<tr>
<td>TN81CH</td>
<td>CSD-V</td>
<td>9+3</td>
</tr>
<tr>
<td>HAW20/28CG</td>
<td>CSD-V</td>
<td>5</td>
</tr>
<tr>
<td>HAW28M</td>
<td>CSD-V</td>
<td>2+4</td>
</tr>
<tr>
<td>Castor I-c-Diorit</td>
<td>spe</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>53+30</td>
</tr>
</tbody>
</table>

*Spent Fuel*  
*High active waste*
Legitimation – Legal Basis

- **Guideline ENSI-G05**: transport and storage casks for interim storage (issued 2008 replacing guideline HSK-R-52 issued 2003)
  - **Package requirements** for storage (e.g. aircraft crash, earthquake, temperature, dose, criticality, age effects)
  - **Fabrication monitoring** by future owner (NPP) and ENSI/SVTI including volume of fabrication documentation
  - **Use and control** during interim storage of the cask
Legitimation – Legal Basis

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**Survey** of the manufacturing of the transport and storage casks for interim storage in Switzerland by a third-party organization.
Basis and Aim of Survey

Storage Safety Analysis Report

Basis for survey of qualification and manufacturing

Approved by Swiss Authority (ENSI)

Third-party organisation

Figure: GNS
AIM:

Compliance assurance to Safety Analysis Report of each cask manufacturing

Supervision Activities:
1) Before Manufacturing
2) During Manufacturing
3) After Manufacturing
Activities - before Manufacturing

- Qualification of production processes (before series manufacturing)
- review of qualifications documents (for ex. WPQR)
- reporting ENSI

- After successful qualification of production processes
- review of the manufacturing documents for example:
  - quality plans for assembly, testing and manufacturing (Hold and Witness Points for mandatory inspections)
  - list of components and materials
  - drawings
  - welding specifications (WPS)
  - specifications for assembly and testing of casks, for ex. NDE, heat treatment, trunnions and hydrostatic tests
Activities - during Manufacturing

➔ **Inspections** by manufacturing and testing operations (spot-check concept)

- Mechanical tests (tensile, hardness and impact tests) of cask parts (related to mechanical integrity)
- Control of the welding process of the welds with containment function
Activities - during Manufacturing

- Dimensional and visual controls
- Non-destructive examinations after the heat treatment or post weld heat treatment
- Resin pouring
Activities - during Manufacturing

- **Review of deviation reports** related to detected non-conformances or required modifications (derogations)

<table>
<thead>
<tr>
<th>DEVIATION / DEROGATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Class 1</strong></td>
</tr>
<tr>
<td><strong>Class 2</strong></td>
</tr>
<tr>
<td><strong>Class 3</strong></td>
</tr>
</tbody>
</table>
Activities - during Manufacturing

➡ Final inspection (each cask)

➡ Hydrostatic test, Trunnions loading test, Leak tightness tests,

➡ Review of quality plans and final manufacturing documentation
Activities - after Manufacturing

- Review of QA Lifetime Records
- Review of the **QA Lifetime Records** at the manufacturers to check
- compliance with SAR
- suitability for duplication and microfilming.
Aspects of Survey

- Product based survey
- Each step in attended by SVTI qualified Inspector based on the requirements of our type A third-party certification.
- Each deviation and derogation is directly known and assessed.
- Assurance of compliance to SAR of each cask
Conclusion

➡️ Each manufacturer and associated subcontractors of Transport and Storage Casks for Switzerland shall be familiar with the survey requirements of the Swiss Authorities ENSI.

➡️ That way, they can implement from the beginning on the measures to comply with these requirements.

➡️ Doing so, the associated financial burden can be considered and also the delays on the delivery of the casks can be avoided.

➡️ Because without casks for spent fuel there will be no dry storage waste management.

No cask in Switzerland is interim stored without confirmed compliance to Safety Analysis Report by an authorized third party organisation