**Session 7.2.5\_BettermannIntegration Group for the Safety Case (IGSC) Symposium 2024***MOVING TOWARDS THE CONSTRUCTION OF A SAFE DGR – GETTING REAL*

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| **Abstract Number: 15** | **Session 7.2.5** |
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| **Abstract Title:**  **Dry Storage of spent TRISO fuel – 30 years of experience** | |
| **Abstract (300-500 words):**  Many small modular and advanced reactors designs are likely to be constructed and start up in the foreseeable future. While this progress provides a great outlook for the nuclear industry in general it is worthwhile to have a closer look on challenges that might come up for those reactor designs in the future that have already been solved for similar designs in the past. Many of the current advanced reactor designs have predecessors that had been operated somewhere in the world.  Some of the currently discussed advanced reactor designs feature TRISO (TRi-structural ISOtropic particle fuel) pebble fuel e.g., the XE-100 reactor design of x-energy. Two very similar reactors that were also running on such fuel have been operated in Germany in the past. Namely two high temperature gas cooled reactors, the AVR (Arbeitsgemeinschaft Versuchsreaktor) reactor in Jülich and the THTR-300 (Thorium-Hochtemperatur Reaktor) reactor in Hamm. While these two reactors have been shut down 1988 and 1989 respectively, they are both still waiting for their decommissioning.  Directly after shutdown the spent fuel of both reactors has been removed for dry interim storage. In the case of the AVR almost 290.000 fuel pebbles have been loaded into 152 dry storage casks of the CASTOR® THTR/AVR design in the 1990s, which are kept in the on-site interim storage facility in Jülich. Plans to move those casks to a centralized consolidated storage facility are one of the potential options for further storage of the AVR fuel. In the case of the THTR-300 about 675.000 pebbles have been loaded into 305 CASTOR® THTR/AVR casks and subsequently transported to the centralized storage facility in Ahaus for interim storage.  The CASTOR® THTR/AVR cask type is a variation of the widely used CASTOR® spent fuel casks specifically adapted for spent BISO and TRISO pebble fuel of HTR. The cask design has received an initial Typ B transport approval in Germany in 1987 with subsequent renewals until today and a validation of the Typ B approval in the US in 2017. Furthermore, it received storage approvals similar to a 10CFR-72 license in the US, both for the Jülich on-site storage facility and the centralized storage facility in Ahaus.  While today’s plans for dry storage of spent TRISO pebble fuel certainly differ from the designs in the late 1980s and 1990s, the experience gained over the last 30 years of storing such fuel can provide valuable input for the reactor designs currently under planning. | |