

Pebble Technology for HT Nuclear-Reactors to generate Heat for Industrial Processes and Electric Power – current status.

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Hydrogen days cover a vast spectrum of H topics. Conversion, use and distribution take a large share. This focuses the generation of H, which needs much energy for most of the processes like reforming, partial oxidation, pyrolysis, electrolysis, thermocatalytics etc. The input is mostly steam, fossil or water. Also the final use is important: Hydrogen direct for fuel cell, for hydrogenation of car fuel or else.

The widely preferred electrolytic generation from water needs lots of cheap electricity. It is known, that nuclear can be the cheapest and stablest source for electric power. It is less known for high temperature. Nuclear has a certain reputation of being dangerous, because of the three main accidents everybody knows. But fossil generating electric power also causes many fatalities. The WHO speaks of 7 Million deaths per annum, much more than all nuclear caused ones.

The way in between these challenges is a nuclear plant with pebble bed technology. This avoids meltdown, MCA, LOCA and other radiological accidents. It is reliable and independent of mechanic or human action. It works by natural laws, wisely applied. Not only promised but proven.

Pebble bed technology, originally developed in Germany and now realized in China shows a special approach in the application of physics. Witnessed test- and demonstration examples in Germany and China showed three times its inherent safety. In Juelich, Germany two tests of maximal credible accident (MCA) were successful in the 60ies and 70ies. In 2007 this was repeated at Tsinghua University, China. These three “Meltdown-Tests” have proven, that overheating leads to “peaceful” shutdown rather than explosion and contamination.

Other benefits of this technology are:

- Lower construction cost because almost no need for safety mechanisms
- Much less electronics/ digitized apparatus reduce need for highly trained personnel
- Proliferation of PU is prevented, because there is no attraction for terrorists
- Pebble fuel elements carry their own long-term storage with them after burn-up
- Distributed small safe reactors avoid large overland electricity networks
- Insurability by commercial policies rather than leaving the risk to the public
- high temperature allows multiple use for various purposes, e.g.:
 - Hydrogenation of car fuel
 - Hydrogen production
 - Seawater desalination
 - Electric power Generation
 - Remote heating for agriculture and urban areas

A special look to the car fuel production shows the following benefits:

- Proven technology (e.g. Fischer-Tropsch) can be used and be further optimized
- Continued use of the existing car fuel logistics (vs. electro mobility)
- Preserving todays car and motor production including jobs, because currents motors need minimal adjustments for ethanol fuels
- Main feed stock will first be coal, then bio-waste and even CO₂

