**Wet Storage and Transportation of the Spent Fuel from Fluoride Salt-Cooled High-Temperature Reactors**

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# Supplementary Information

Table 1: Geometry, materials and thermodynamic parameters used for heat transfer modeling in the storage pools.

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| **Thermodynamic Properties** [19], [20] | | |
| *Parameter* | *Value* | *Unit* |
| Thermal Conductivity Pebble | 12 | W m-1 K-1 |
| Thermal Conductivity FLiNaK | 0.85 | W m-1 K-1 |
| Prandtl’s Number FLiNaK *Pr* | 17.49 | - |
| Density FLiNaK | 2095 | kg m-3 |
| Dynamic Viscosity FLiNaK | 7.909 10-3 | Pa s-1 |
| Specific Heat FLiNaK | 1880 | J kg-1 K-1 |
| Thermal Expansion Coefficient | 2.917 10-4 | K-1 |
| **Thermal and Geometric Design Parameters** | | |
| *Parameter* | *Value* | *Unit* |
| Pebble Fill Fraction in Containers | 0.60 | - |
| Pebble Radius | 0.015 | m |
| Depth of Pebble Container Roof | 2 | m |
| Ambient Temperature | 504 | °C |
| **Container Parameters – 1 Year Storage Scenario** | | |
| *Parameter* | *Value* | *Unit* |
| Container Height *z* | 0.724 | m |
| Cross Section Area *A* | 30.74 | m2 |
| **Container Parameters – 4 Year Storage Scenario** | | |
| *Parameter* | *Value* | *Unit* |
| Container Height *z* | 0.724 | m |
| Cross Section Area *A* | 91.29 | m2 |
| **Container Parameters – 4 Year Storage Scenario** | | |
| *Parameter* | *Value* | *Unit* |
| Container Height *z* | 0.724 | m |
| Cross Section Area *A* | 212.87 | m2 |

Table 2: Geometry, materials and thermodynamic parameters of HI-STAR 100 cask model.

|  |  |  |
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| **Geometric and Thermal Design Parameters** | | |
| *Parameter* | *Value* | *Unit* |
| Fuel Basket Internal Diameter | 1.708 | m |
| Fuel Basket External Diameter | 1.726 | m |
| MPC Internal Diameter | 1.731 | m |
| MPC External Diameter | 1.737 | m |
| Overpack Internal Diameter | 1.746 | m |
| Overpack Inner Shell Thickness | 0.063 | m |
| Overpack Mid Shell Thickness | 0.175 | m |
| Overpack Neutron Absorber Thickness | 0.120 | m |
| Overpack Lead Shell Thickness | 0.040 | m |
| Fuel Basket Height | 4.855 | m |
| Overpack Height | 5.163 | m |
| Pebble Diameter | 0.030 | m |
| Absorbing Sphere Diameter | 0.010 | m |
| Pebble Fill Fraction in Basket | 60% | - |
| Absorbing Spheres Fill Fraction in Basket | 24% | - |
| Thermal Conductivity Pebble | 12 | W m-1 K-1 |
| Thermal Conductivity Abs. Spheres | 25 | W m-1 K-1 |
| Thermal Conductivity He Filler | 0.18 | W m-1 K-1 |
| Thermal Conductivity Al Shim | 180 | W m-1 K-1 |
| Thermal Conductivity Lead | 34.7 | W m-1 K-1 |
| Thermal Conductivity Steel | 50.2 | W m-1 K-1 |
| Equivalent Thermal Conduct. Neut. Abs. | 5.02 | W m-1 K-1 |
| Overpack Emissivity | 0.8 | - |