



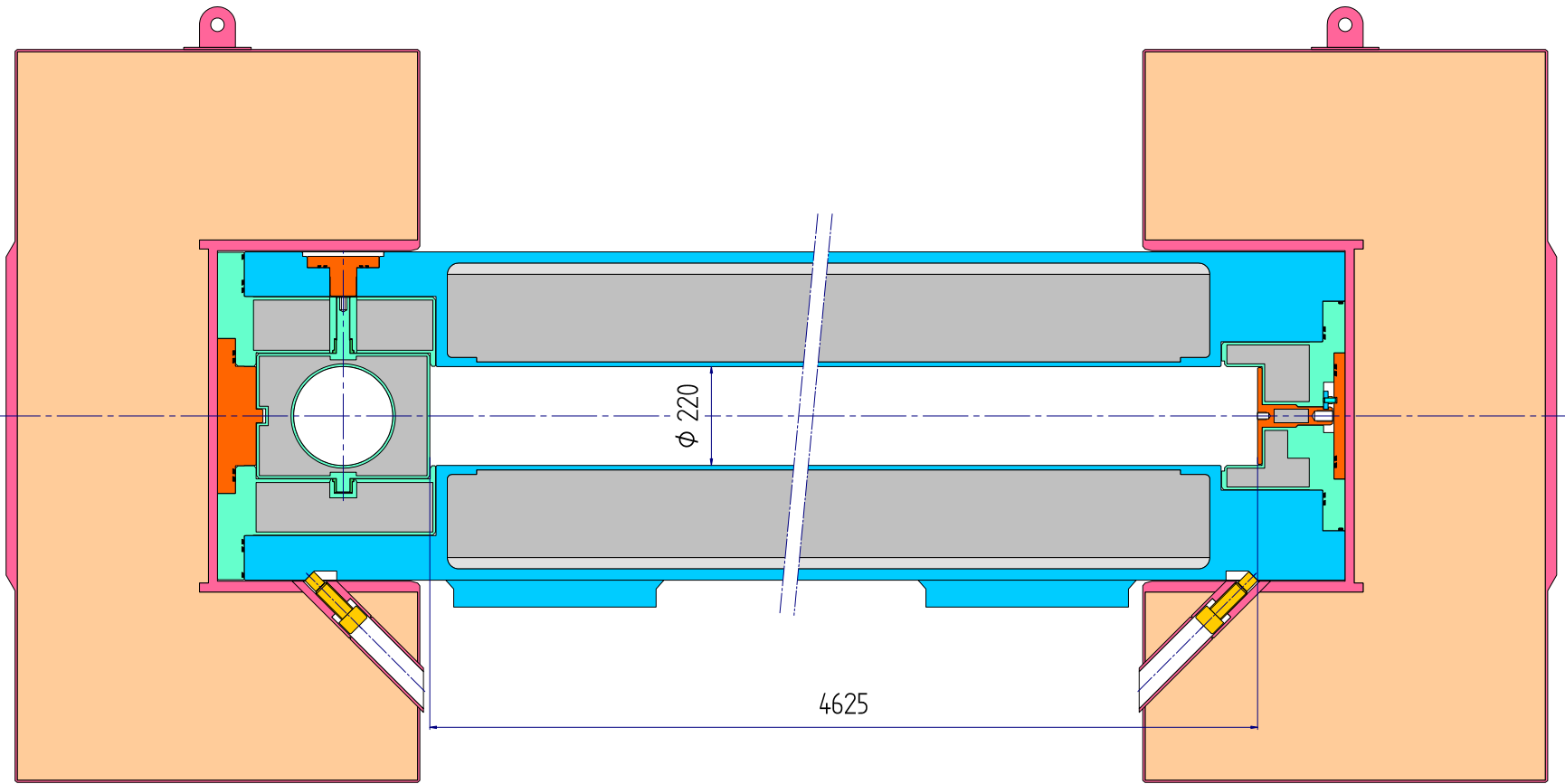
The NCS 45 Cask Family

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NCS 45 design

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- **fuel pins of PWR, BWR and FBR fuel assemblies**
 - **fuel elements and plates of MTR reactors**
 - **arbitrary mixtures of uranium and/or plutonium**
 - **uranium/plutonium-hydrogen compounds**
 - **uranium/plutonium and graphite**
 - **non fissile radioactive material**

Radioactive contents

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- **burn-up PWR and BWR: 120 GWd/MgHM**
 - **cooling time PWR and BWR: 10 days or more**
 - **burn-up MTR: 560 GWd/MgU**
 - **cooling time MTR: 60 days or more**
 - **thermal power: 3000 W**

Irradiation history

➤ **safe concentration**

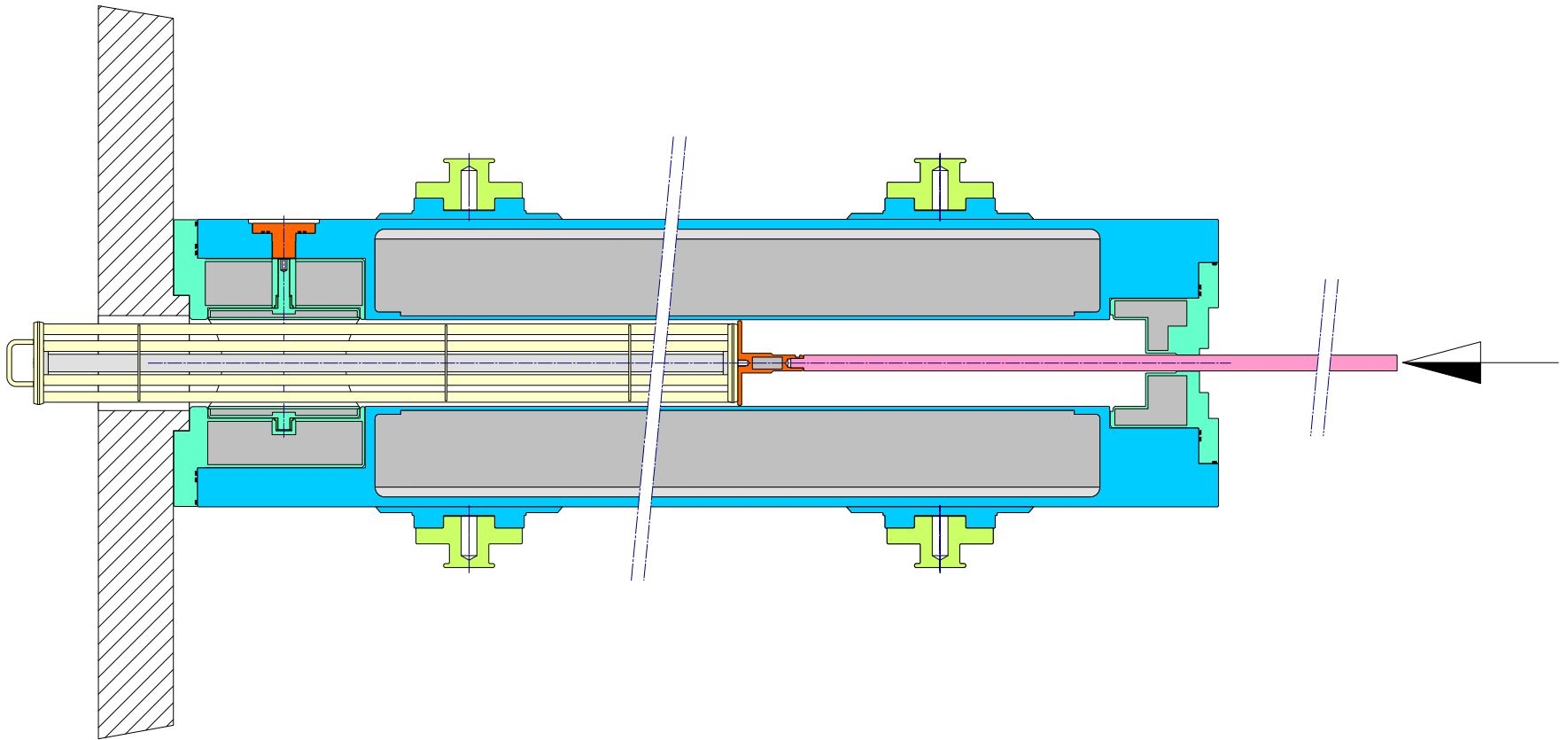
➤ **safe geometry**

➤ **safe mass**

Criticality safety philosophy

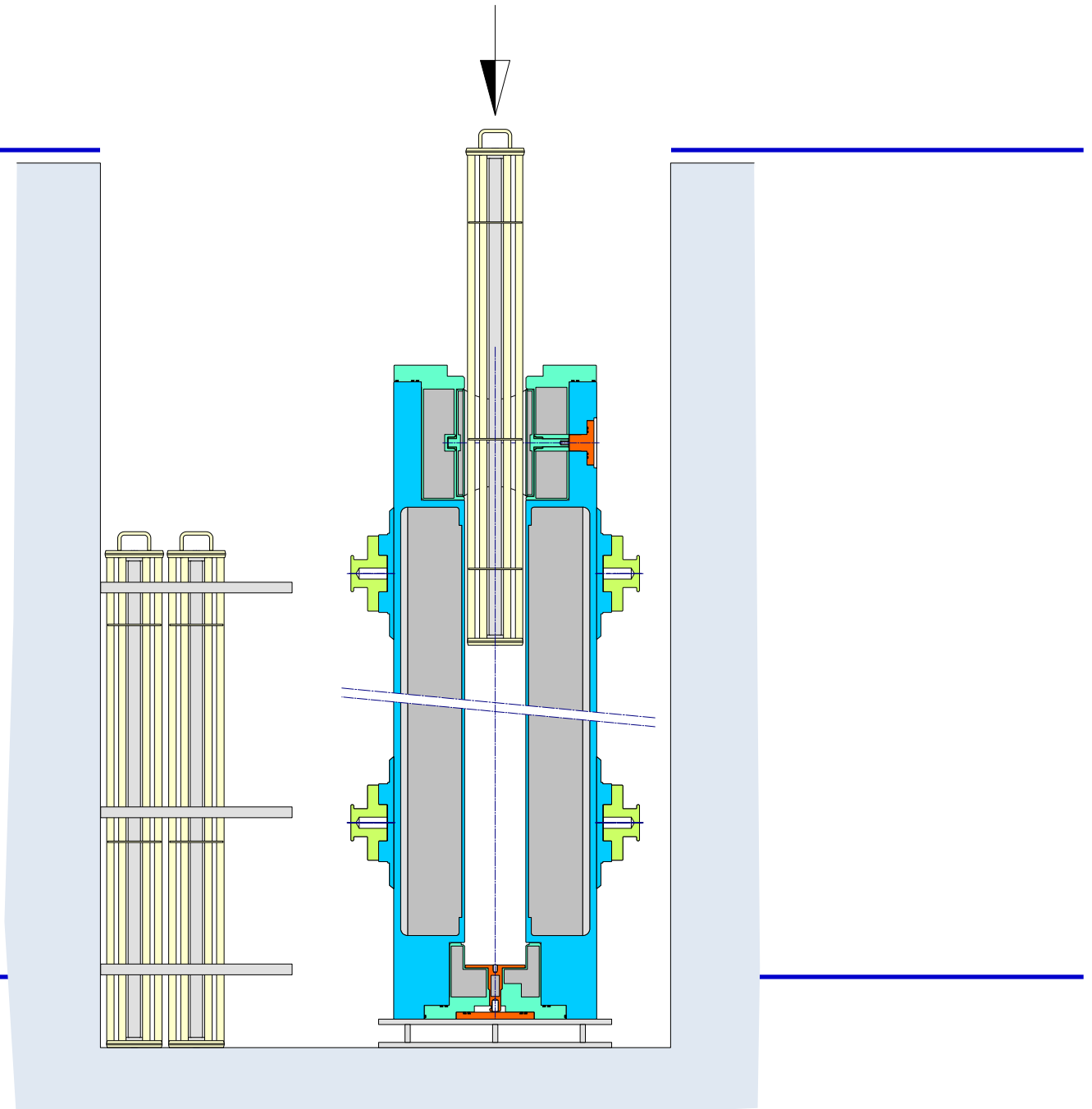
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- **MOX fuel pins with weapon grade plutonium**
 - **EPR fuel pins**
 - **corroded MTR fuel**
 - **actinide transmutation fuel**
 - **pebble bed reactor fuel**
 - **material samples in hydrogen containing material**

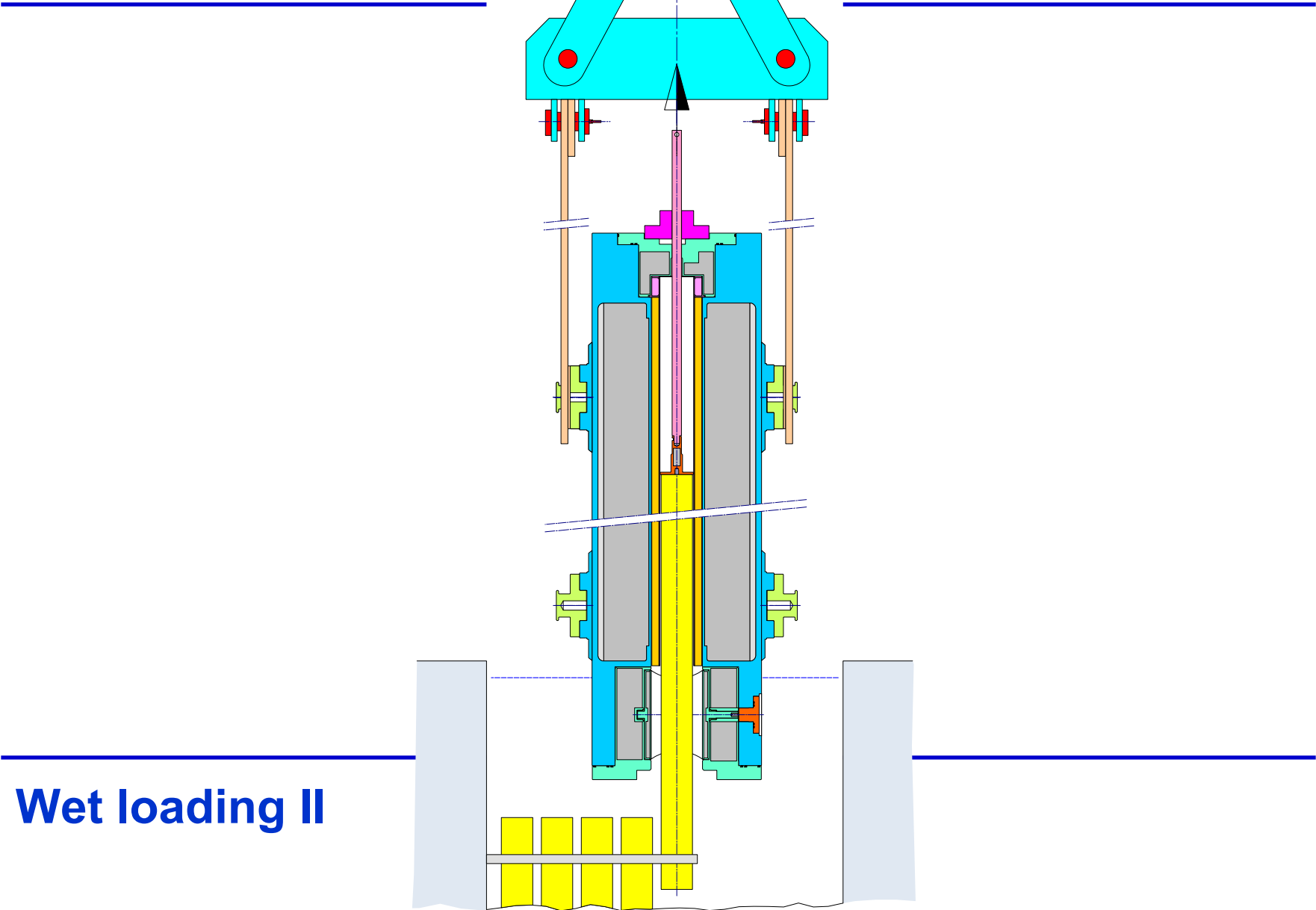
Examples of special contents



Dry loading

Wet loading I





Wet loading II

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- **application for package approval: July 2002**
 - **basis: TS-R-1 (As amended 2003)**
 - **first drop test: spring 2004**
 - **last drop test: summer 2005**
 - **certificate expected second half 2006**

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- **3 drop tests from 0.3 m height**
 - **6 drop tests from 9 m height**
 - **one 9 m drop test at operating temperature**
 - **5 drop tests from 1 m height onto the bar**
 - **one shear off test from 1 m height**

Drop testing with 1:3 model

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- **the model survived 7 times the requirements**
 - **leak tightness was preserved after the drop tests**
 - **shock absorber performance as expected**
 - **no lead slump**

Results of drop testing

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- **with the NCS 45 cask family NCS can provide transport services for a comprehensive list of fuel types**
 - **handling options allow easy adaptation to all specific needs of the customer**
 - **design and licensing complying with the newest regulations enable validation and use in all countries**

Conclusions