



## Summary Slide – FIP/2-2

# Design and R&D Progress of Chinese HCCB TBM

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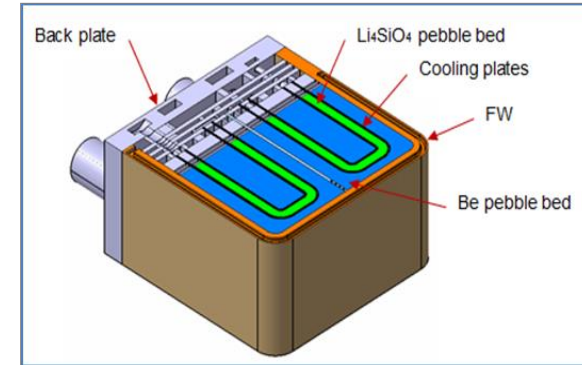
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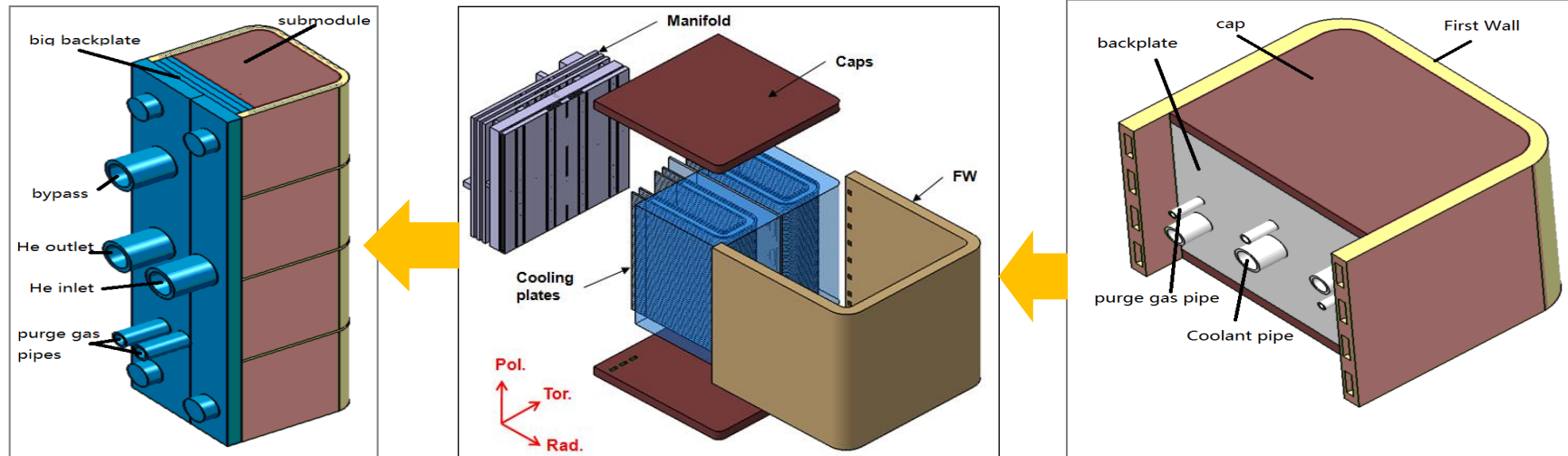
## ● Main Design characteristics of CN HCCB TBM

- TBM structure: Sub-module arrangement
- Structure material: RAFM (CLF-1);
- Tritium breeder:  $\text{Li}_4\text{SiO}_4$  pebble bed, 80%Li-6 ;
- Neutron multiplier: Be pebbles bed;
- Coolant and purge gas: Helium gas
- Coolant pressure: 8MPa
- Coolant temperature: 300 °C(inlet) -500 °C (outlet)
- Tritium production ratio (TPR): 0.0585g/d



Cross-section of SB

- The updated design of Chinese solid breeder test blanket (CN HCCB TBM) is completed.



Updated design of CN HCCB TBM module



## Progress on R&D of CN HCCB TBM

- R&D on key components, structure and function materials, fabrication technology, etc., have being developed.
- Main R&D highlights :
  - **Structure Material**

A 500kg of RAFM(CLF-1)steel was recently produced by vacuum induction melting and electro-slag remelting method.
  - **Neutron Multiplier**

Exploration study of neutron multiplier Be pebbles fabrication technology using REP method has been done.
  - **Tritium Breeder**

Two kinds of the solid tritium breeder,  $\text{Li}_2\text{TiO}_3$  and  $\text{Li}_4\text{SiO}_4$ , have been investigated in China.
  - **Helium Test Loop**

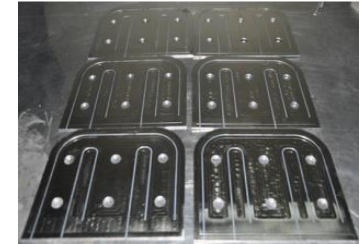
The design of a test helium loop working at high pressure (8MPa) and high temperature (550 C) prior to TBMs installation in ITER have been completed.
  - **Test facility construction**

An e-beam facility of 400kW have being constructed at SWIP.
  - **Fabrication of FW and Sub-module**

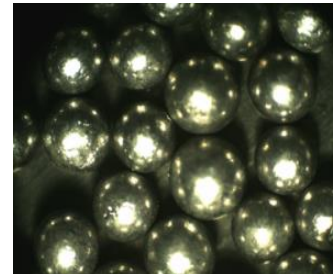
A 1/3 sized mock-up of FW and sub-module have being fabricated at SWIP.



Cooling plate



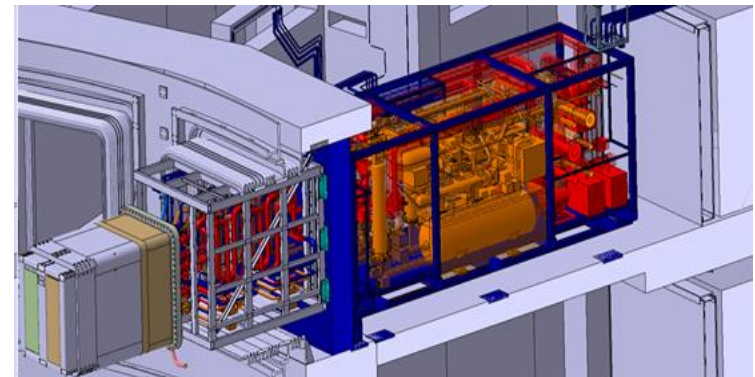
Sub-module segment



Be pebbles



He Loop



Integrated design for AEU in Port Cell