



Office of Nuclear Energy FY 2010 University Program Workshop

Mike Patterson

***NGNP – Gen IV
Heat Transport***

INL

***Salt Lake City Hilton Center
Salt Lake City, UT
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NGNP, NHI and Gen IV Status

◆ **NGNP**

- Waiting to start conceptual design - decision on core type to be made after preliminary design. Reactor outlet temperature: 750°C - 800 °C
- Primary coolant: Helium
- Licensing framework being developed
- Industry will design and license

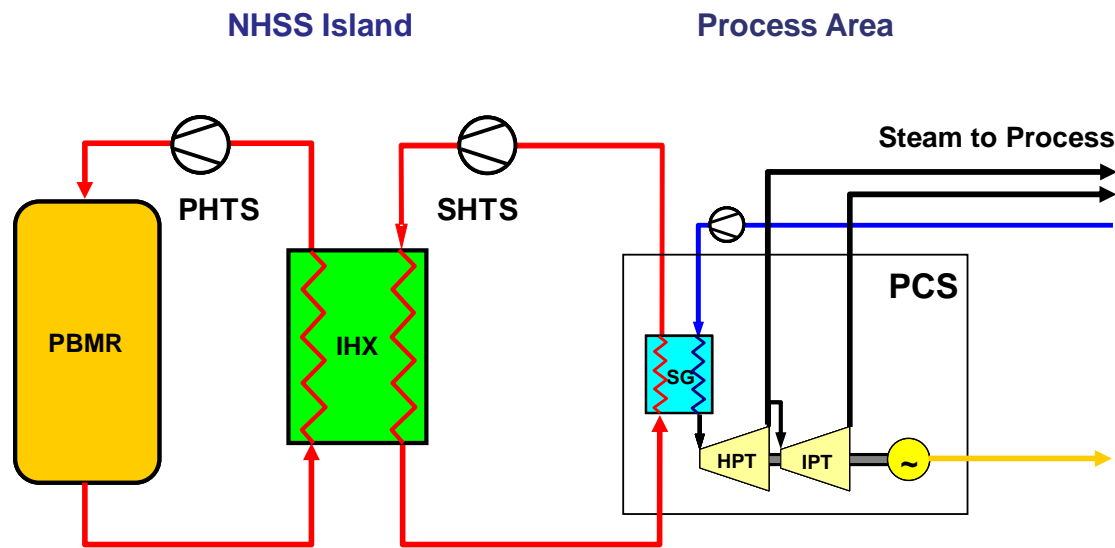
◆ **NHI – hydrogen development shifting to NGNP**

◆ **Gen IV – more stress on R&D for designs other than gas cooled reactors (depends on FY 2010 appropriation language)**



NGNP - 750°C - NEEDS FOR FY10-11

◆ Pebble Bed Design – Intermediate Heat Exchanger



Potential Research Areas

Dynamic Codes (transients)
– several fluids

Joining Processes – brazing
& diffusion bonding

In-service inspection
techniques

Fluid properties

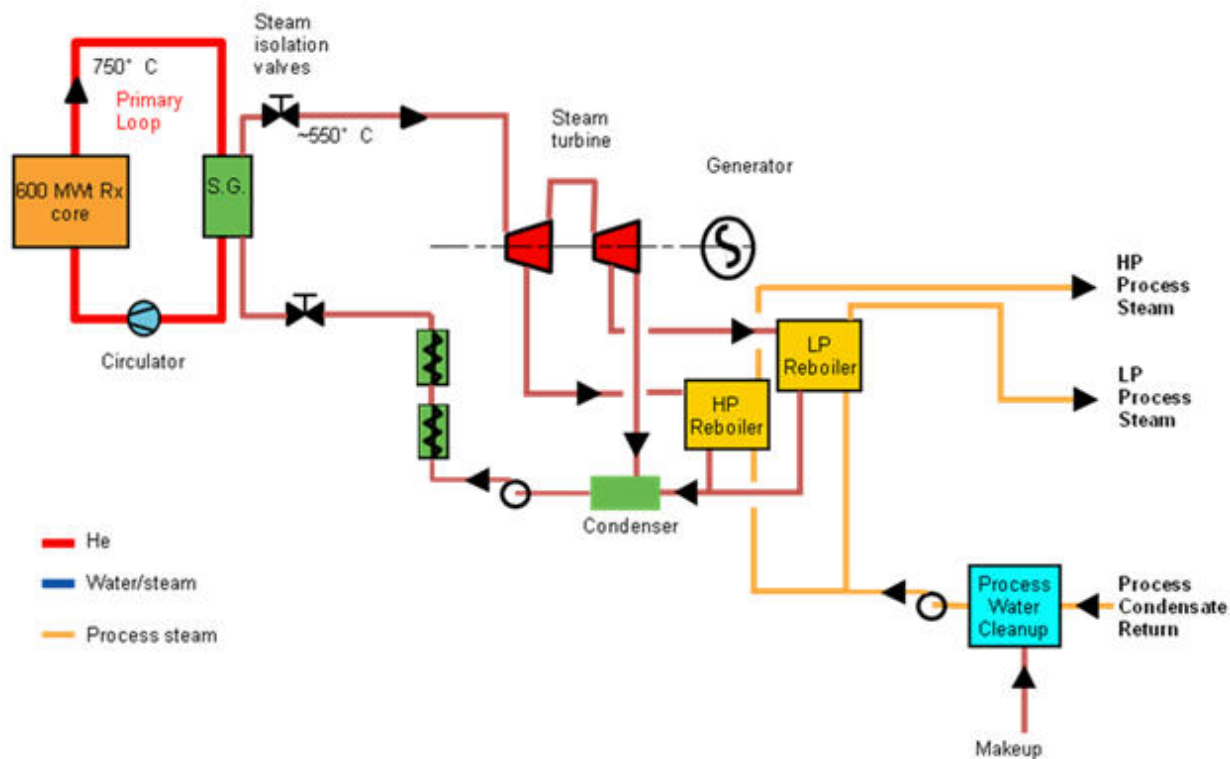
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Behavior of graphite dust



NGNP - 750°C - NEEDS FOR FY10-11(continued)

◆ Prismatic Design – Steam Generator



Potential Research Areas

Dynamic Codes (transients)
– several fluids

Joining Processes – brazing
& diffusion bonding

In-service inspection
techniques

Fluid properties

I&C



NEEDS FOR FY10-11 (Based on Nth of a kind VHTR)

- ◆ ***Longer-term VHTR (950°C) R&D Needs focus on pressure boundaries & safety significant components***
 - *Heat exchangers*
 - *More focus on new compact heat exchanger designs/materials*
 - *Joining processes that withstand higher temperatures*
 - *Hybrid-Sulfur hydrogen production & process heat exchanger*
 - *Tritium treatment/removal systems*
 - *Instrumentation and controls*
 - *Process applications*



General Comments

◆ **Relevancy and other factors**

- *NGNP 750°C - more applied than basic research – design informed R&D*
- *NGNP 950°C – move towards basic research, as impacted by temperature increase*
- *Gen IV – more basic than applied – R&D informing design*
- *Quality Assurance*
- *Discuss OSU example of unsolicited proposal*
- *Technology Development Roadmaps (TDRMs) on Public Communities web page: <http://inlportal.inl.gov/portal/>*
- *LDRD Funding – process heat applications*

◆ **QUESTIONS?**