NGNP Briefing for NEAC

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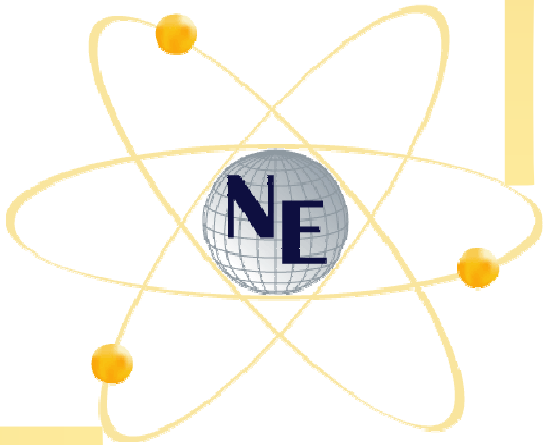
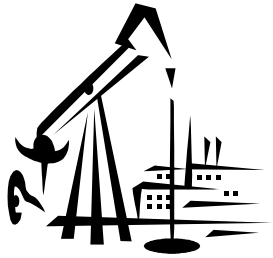


Next Generation Nuclear Plant (NGNP)

- Mission Need Established in October 2003
- Authorized in the 2005 Energy Policy Act
- Advanced reactor for electricity and/or hydrogen
  - High temperature gas-cooled reactor (HTGR)
  - TRISO coated particle fuel
  - Helium cooled and graphite moderated
  - Coupled hydrogen plant
- Cost-sharing collaboration with Industry
- INL is the lead laboratory

HTGRs for the Hydrocarbon Industry

Upstream



Refining

Tertiary Oil Recovery

Process Heat

Oil Sands

Process Heat*

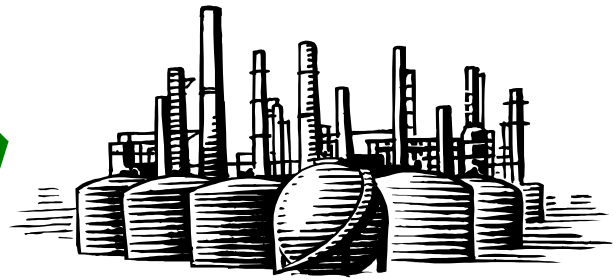
Oil Shale (Future)

Process Heat*

Coal to Liquids and Gas

O_2 & H_2

Future Refinery



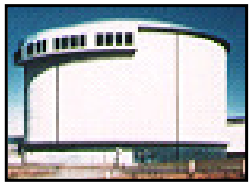
Process Heat & H_2

* H_2 for Onsite Processing

HTGR Experience

EXPERIMENTAL REACTORS

DEMONSTRATION OF BASIC HTGR TECHNOLOGY



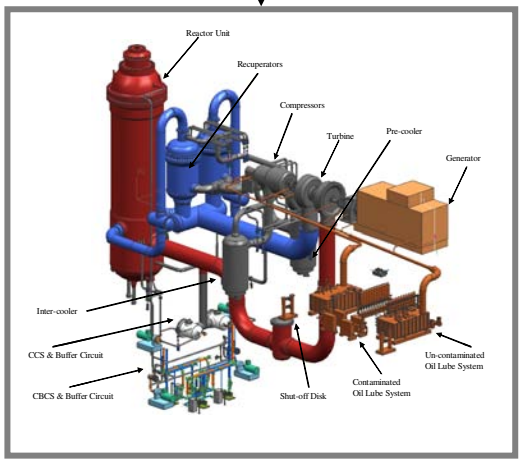
DRAGON
(U.K.)
1963 - 76

AVR
(FRG)
1967 - 1988

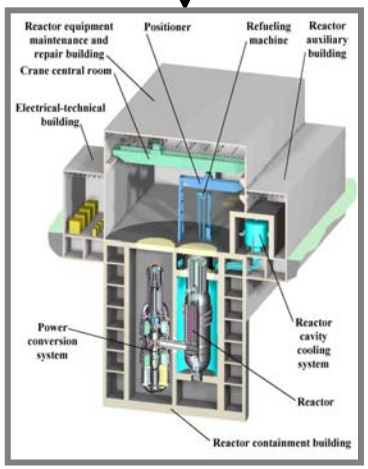
PEACH BOTTOM 1
(U.S.A.)
1967 - 1974

FORT ST. VRAIN
(U.S.A.)
1976 - 1989

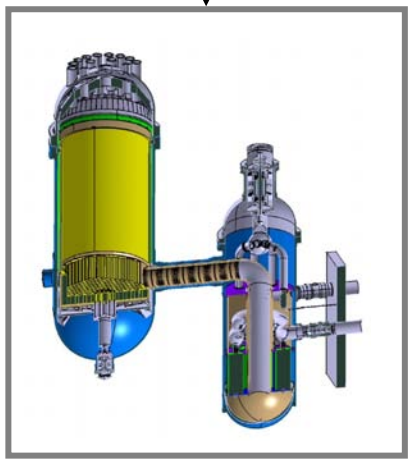
THTR
(FRG)
1986 - 1989



PEBBLE BED MODULAR REACTOR
PBMR



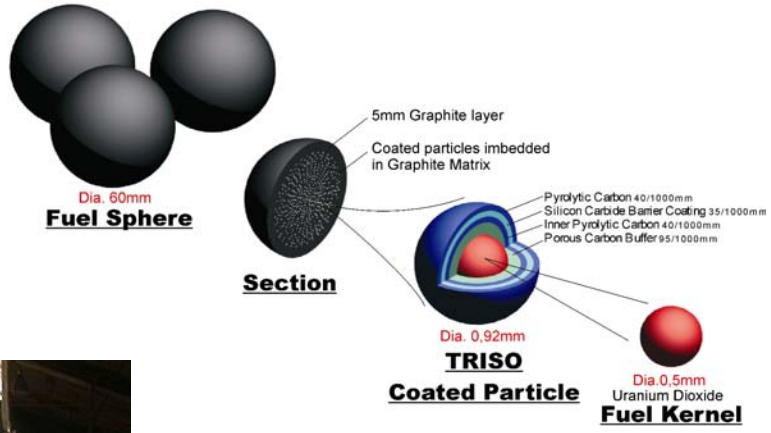
MODULAR HTGR CONCEPT
GENERAL ATOMICS



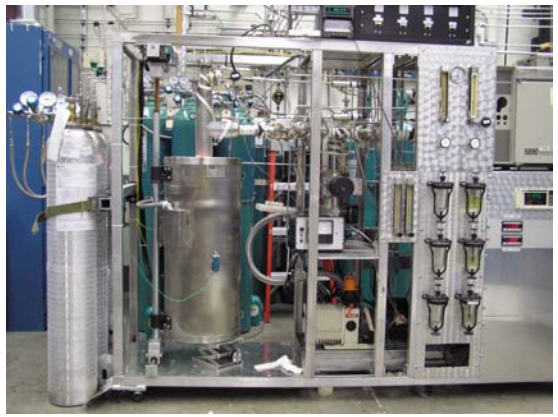
ANTARES
AREVA

NGNP R&D

- Analytical Codes and Methods
- High Temperature Metals
- Fuel Qualification
- Graphite Qualification
- ASME Collaborations



Graphite Block



High Temperature Alloy Low Velocity Environmental Effects Testing

NGNP Licensing Strategy

- EPAct Requirement (P.L. 109-58, Subtitle C Sec. 644(b))
  - NRC and DOE to submit Strategy August 8, 2008
  - Licensing Strategy to include
    - Ways in which current licensing requirements for LWRs need to be adapted for a prototype NGNP
    - Description of analytical tools NRC will need
    - Other R&D activities for development of licensing review infrastructure
    - Estimate of resource requirements associated with the licensing strategy

Licensing Process Options

- 10 CFR Part 50
  - Preliminary design at Construction Permit (CP) stage; final design at Operating License (OL) stage
  - More detailed design information can be provided at CP stage
- 10 CFR Part 52
  - Combined License (COL)
  - Early Site Permit (ESP) & COL
  - Design certification application (DCA) & COL
  - ESP, DCA, and COL

EPAct Project Strategy & Schedule

- Phase I is R&D and technology selection
  – completed by 2011
- Phase II is final design and construction
  – completed by 2021
- DOE to fund not more than 4 designs in a Phase II final design competition
- Built in Idaho
- Public/private partnership

Draft DOE Project Strategy

- Accelerate start of EPAct Phase II
- Cost-share in licensing two designs
- Chose one of two for construction
- Adhere to NGNP Licensing Strategy
- Construction complete in 2021

Partnering with Industry

- RFI/EOI published April 16, 2008, seeking industry recommendations for structuring the project
- Comments due to DOE June 10
- NEAC review by August 15
- DOE to finalize implementation strategy in the Fall
- DOE to make RFP or OFA by end of 2008

NEAC Charge

- NEAC to review and comment on draft NGNP Strategic Program Plan
- NEAC to review responses to RFI/EOI and report to DOE by August 15, 2008