



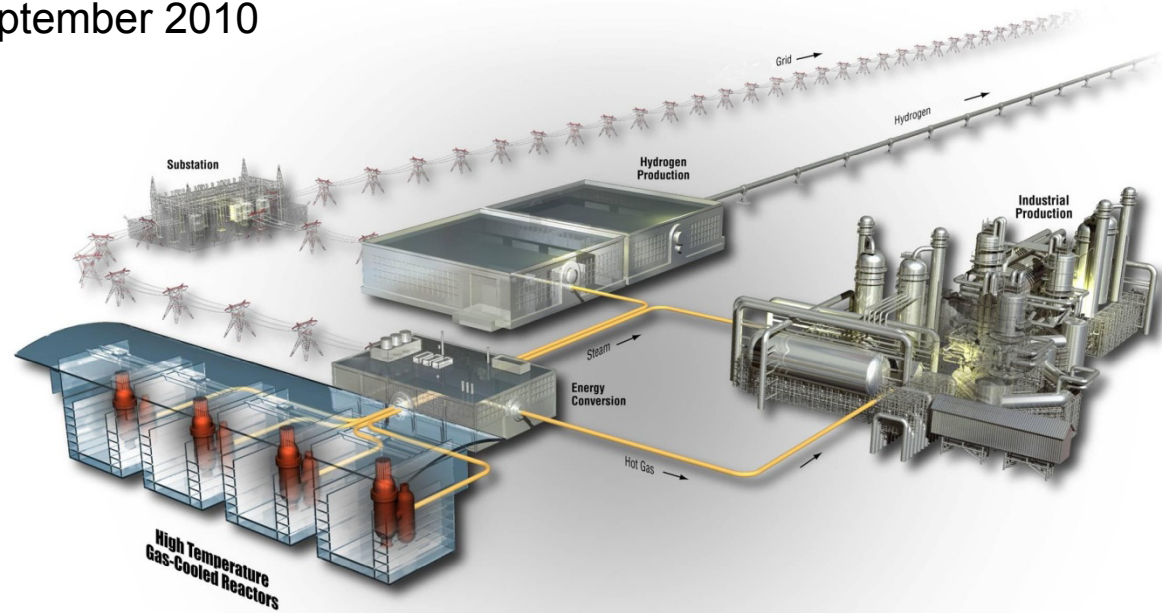
# ***Next Generation Nuclear Plant***

## ***Project Briefing for***

## ***Nuclear Energy Advisory Committee***

**Greg Gibbs**  
Director, NGNP Project  
September 2010

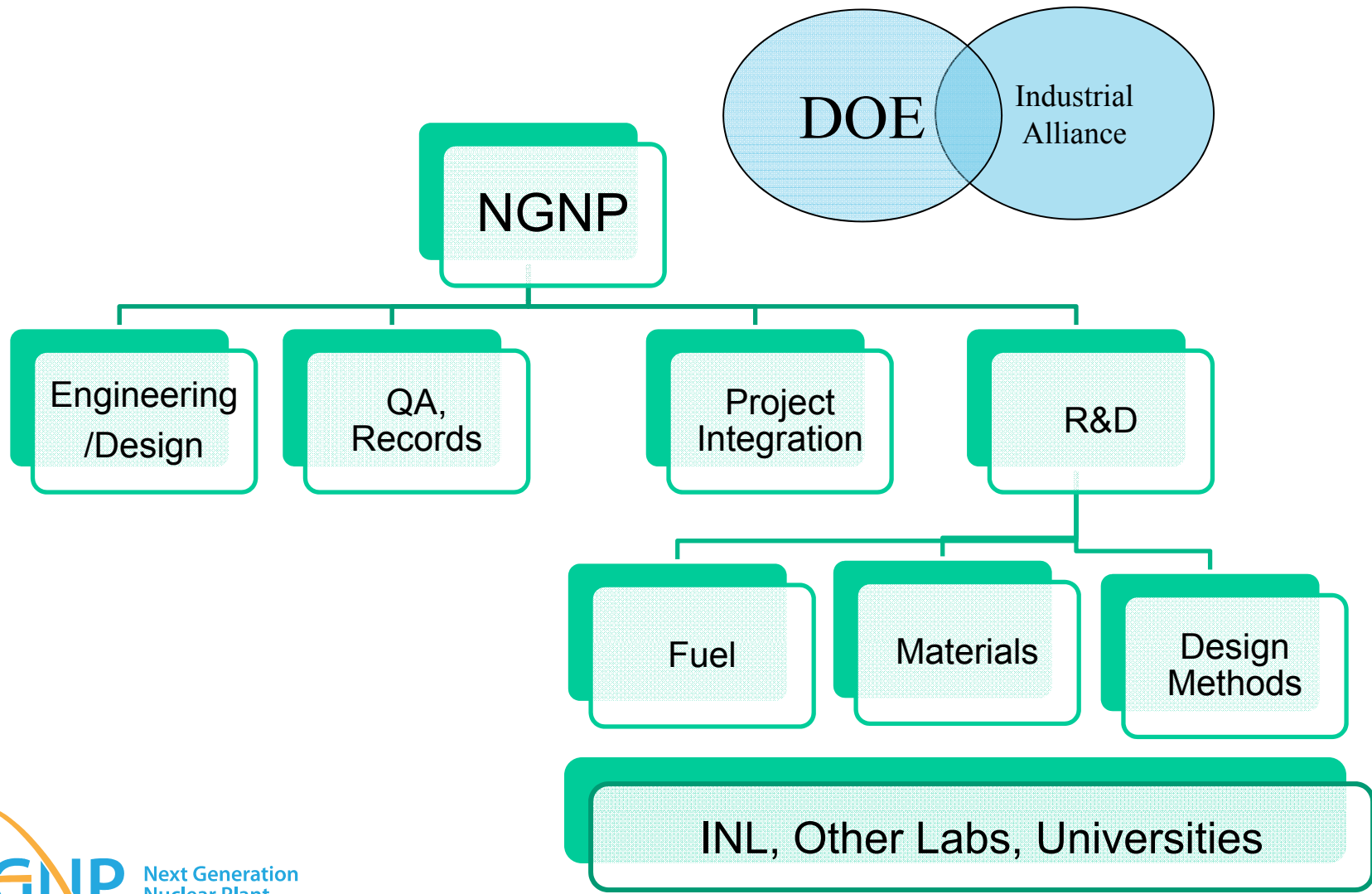
[www.inl.gov](http://www.inl.gov)



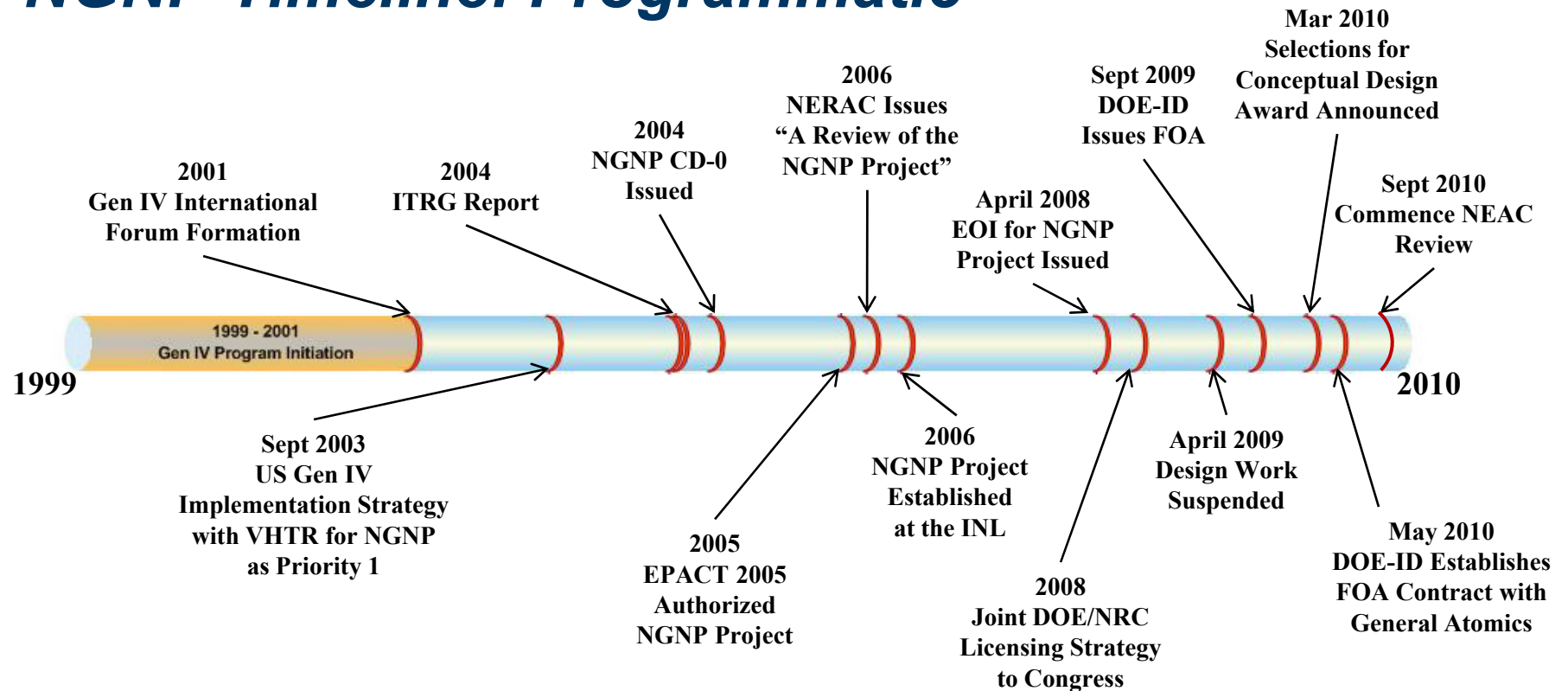
# Outline

- NGNP Organization
- Timelines and Key Decisions
  - Programmatic
  - Research and Development
  - Licensing
  - Engineering & Design
  - Industrial Consortium

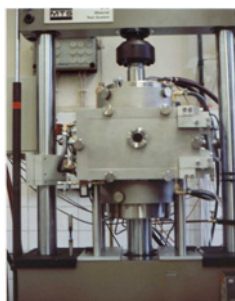
# NGNP Organization



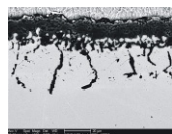
## NGNP Timeline: Programmatic



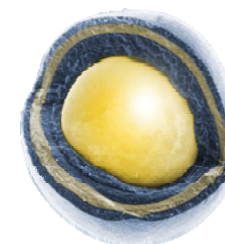
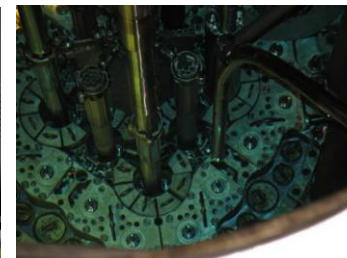
# NGNP Technology Development and Qualification Needs



High Temperature Materials  
Characterization, Testing and  
Codification



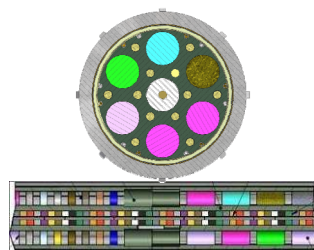
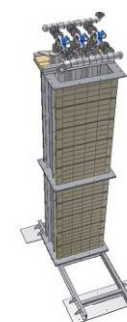
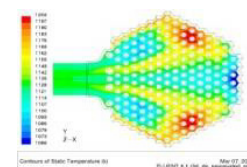
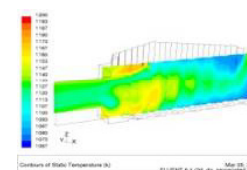
Fuel Fabrication,  
Irradiation, and Safety  
Testing



Graphite Characterization,  
Irradiation Testing,  
Modeling and Codification

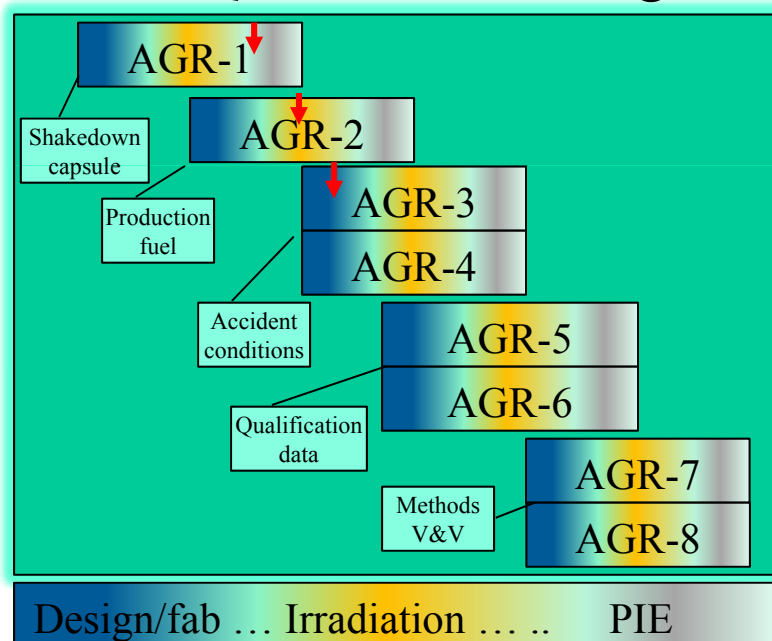


Design and Safety Methods  
Development and  
Validation



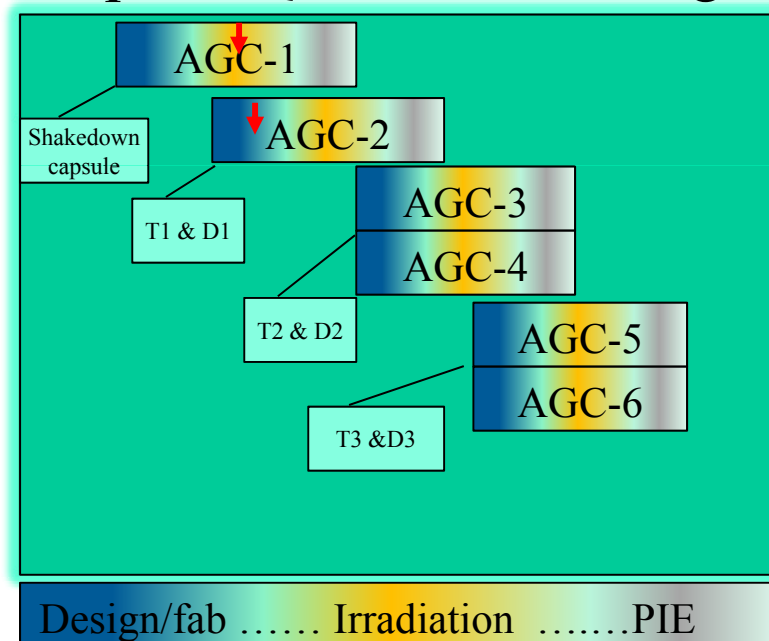
# Example of Qualification Programs: Fuels and Graphite

## Fuels Qualification Program



Current status (↓)

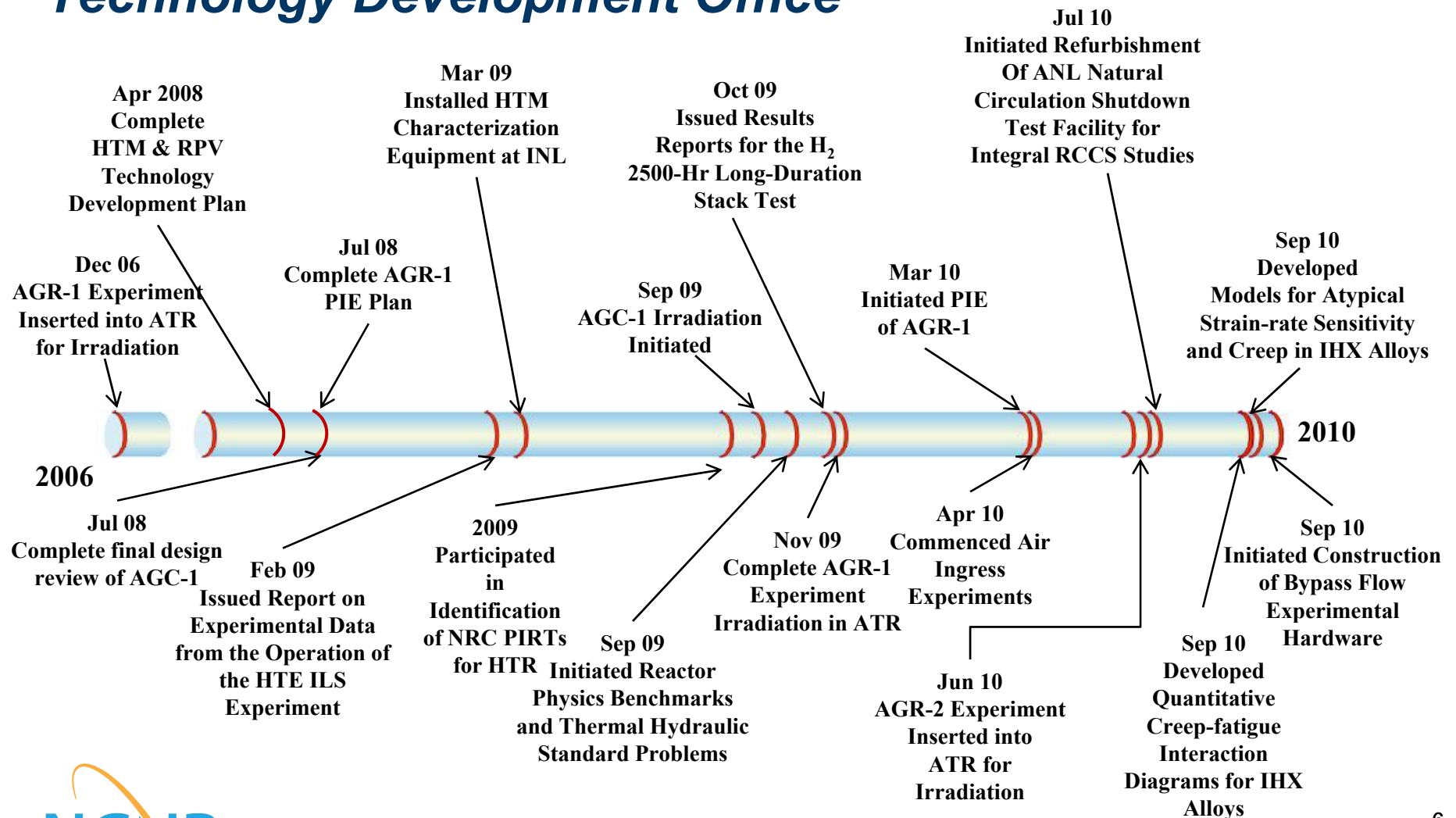
## Graphite Qualification Program



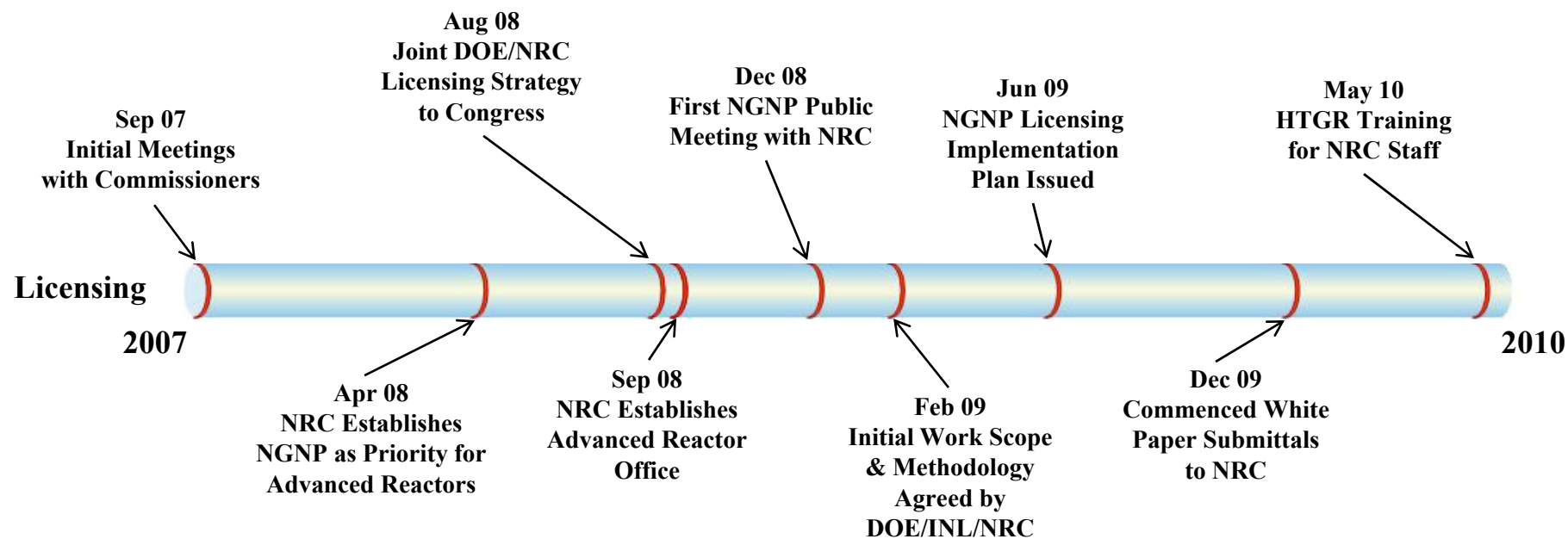
Current status (↓)



# NGNP Timeline: Research & Development, Technology Development Office



## NGNP Timeline: Licensing



ARO – Advanced Reactor Office

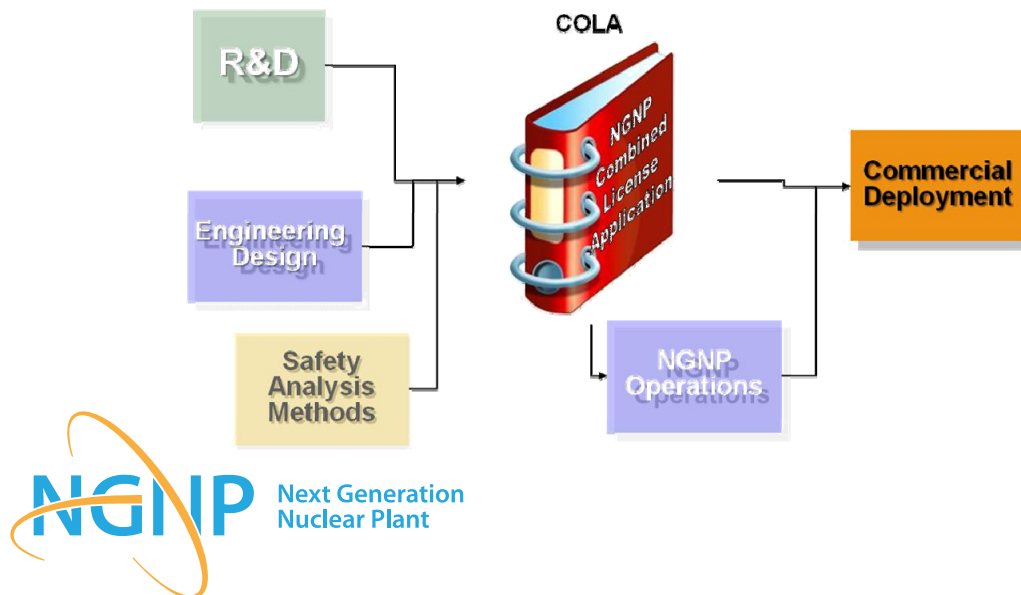
ACRS – Advisory Committee on Reactor Safeguards

RIC – Regulatory Information Conference

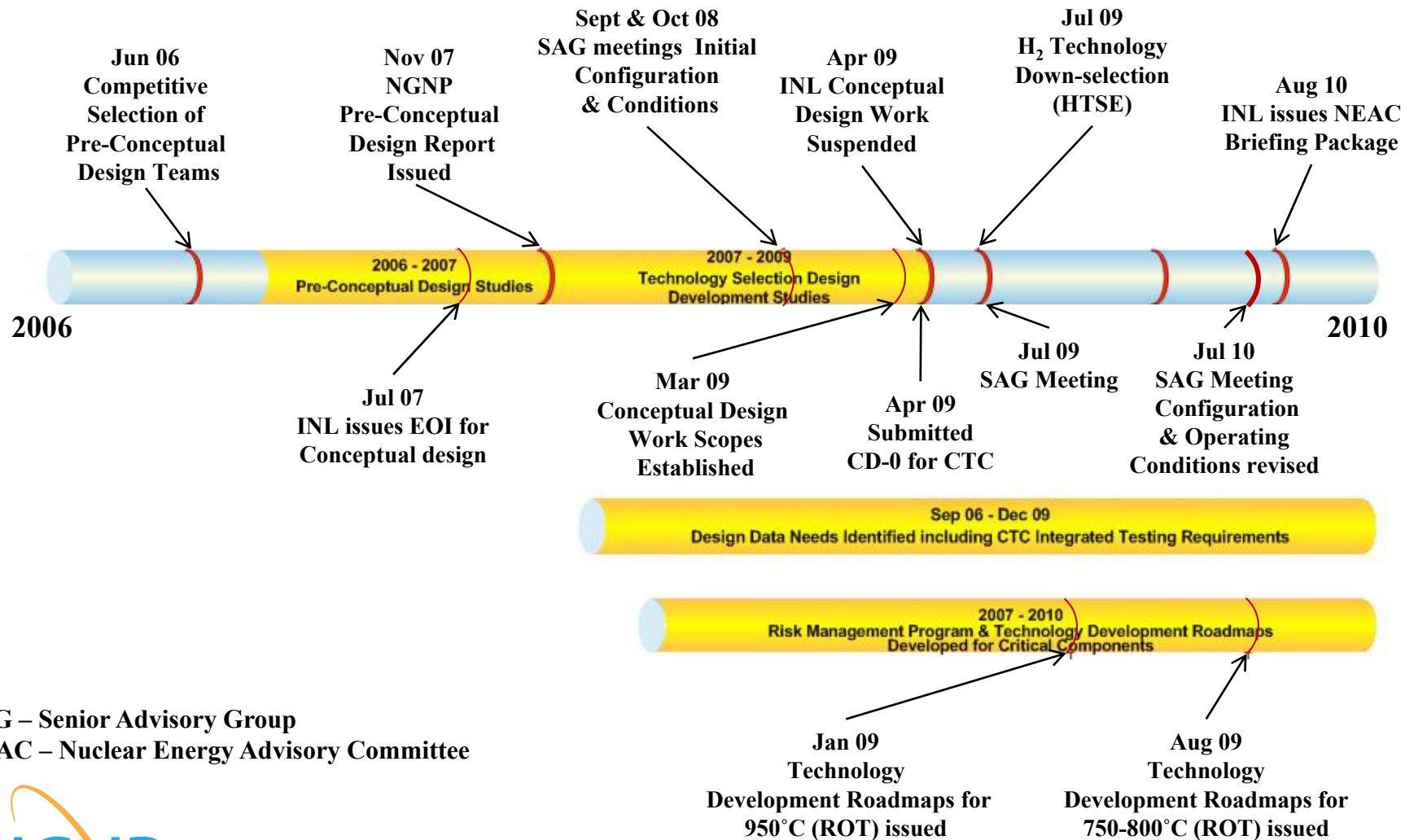


## ***Developed Licensing Strategy in Conjunction with NRC***

- Initiated regular interactions with NRC, leading to
  - Development of Licensing Plan, including identification of high-priority items
  - Agreement on Content-Guide approach for COLA development
  - Development of White papers, first in 2009, four more in 2010
  - Development of training course on HTGRs



# NGNP Timeline: Engineering & Design



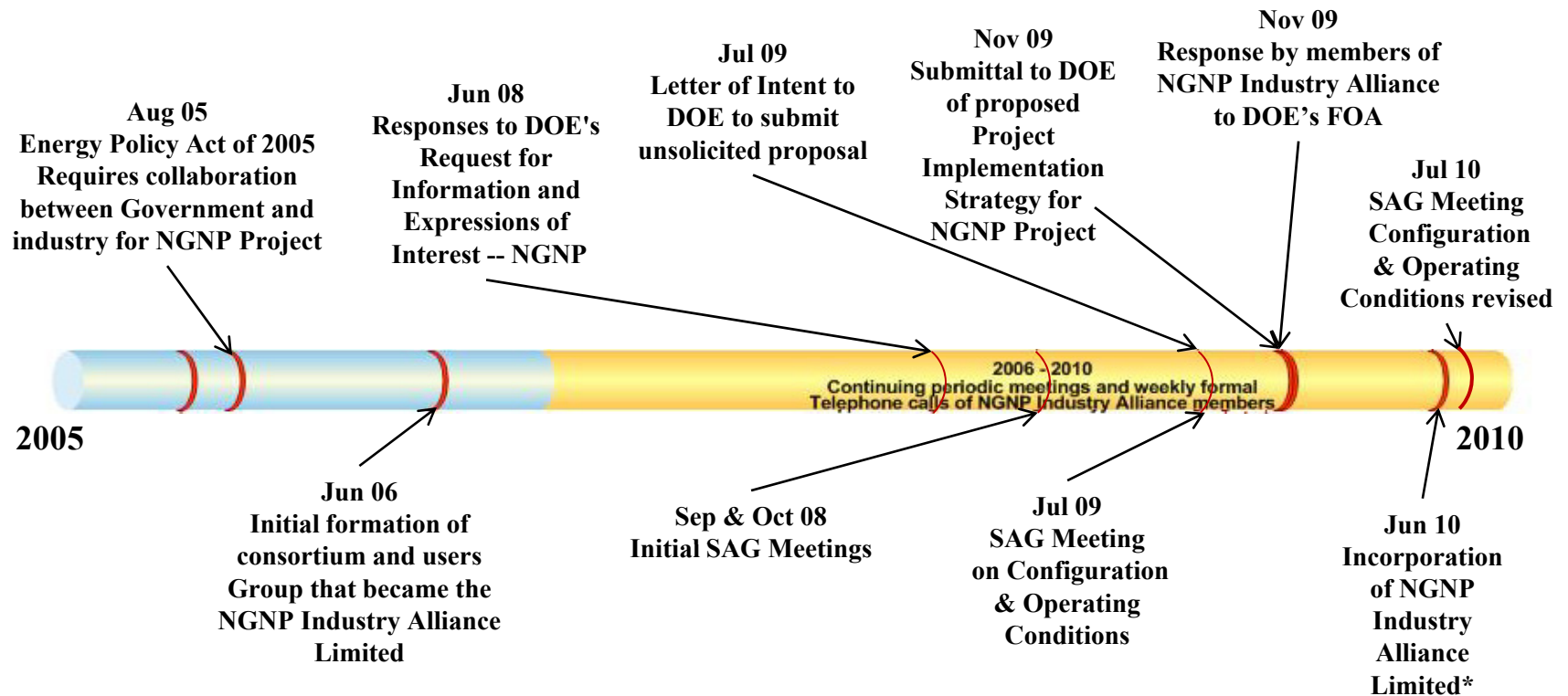
SAG – Senior Advisory Group  
NEAC – Nuclear Energy Advisory Committee

## ***Engineering Studies Provided Framework for Conceptual Design***

- **Generic, technology-neutral studies yielded insights in:**
  - Overall System Requirements
  - Source Term, Fuel Performance
  - Contamination Control
  - Facility Configuration, Embedment
  - Reactor Core Structures, Pressure Vessels, Cooling Systems
  - Power Conversion System, Duty Cycle
  - Heat Transfer and Transport System, Components, Hot Piping and Connectors, Valves, Number of Loops
  - Gas (Heat Exchanger) and Steam (Generators) Cycle Configurations
  - Hydrogen Production
  - Technology Development Road Maps for each Critical System

**The result of these efforts have culminated in design, functional and technical requirements, which will be reviewed later today**

# Industrial Consortium



- Investment by private sector reactor designers - spent last decade advancing the development of their respective HTGR concepts
- During 2008, 2009 and 2010, DOE and Congress were formally notified by the NGNP Industry Alliance of industry's interest, willingness to cost-share and requested the formation of public-private partnership for the NGNP Project