Progress of Above 5% Enrichment Fuel Development in Japan

September 2009

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- Next Generation LWR Development Program in Japan
- Basic Nuclear Characteristics
- Fuel Cycle Capability
- Critical Experiment
- Summary

Next Generation LWR Development Program in Japan –Main Scope -

- Development of Next Generation LWR with;
  - Higher Safety, higher reliability and Economical Advantage
  - Global Standard Design for Worldwide Market

- Feature of Next Generation LWR
  - Electric Output :1,700–1,800 MWe
    (Key technologies are optionally available for mid-size plant: 800-1,000 MWe.)
  - One design each for BWR and PWR types

- National Program for Innovative Technology Development
  - Joint Program of Industries, Utilities and Government
    - ✓ Government gives financial support
    - ✓ Big Program after the ABWR / APWR developed 20 years ago

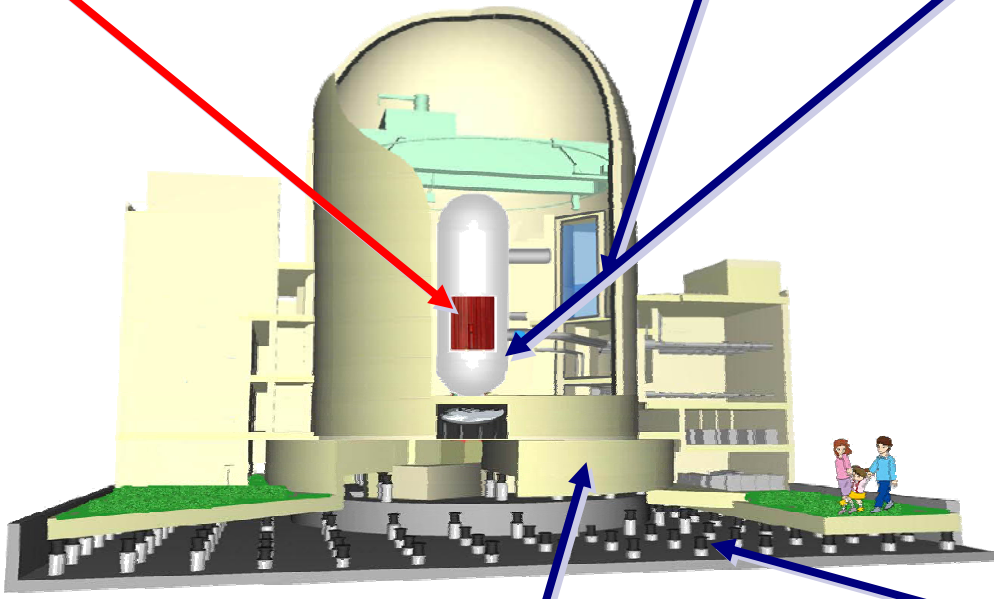
- Positive Effort with Adopting Innovative Technology
  - Effort for Japan's Codes and Standards
  - Elements for Global Standard

Next Generation LWR Development Program in Japan – Concepts Overview -

Reactor Core System with above 5% Enriched Uranium Fuel

Hybrid Safety System (optimized passive and active safety)

Long-Life Materials and Innovative Water Chemistry Technologies



Electric Output

1,700–1,800 MWe

Reactor Type

PWR / BWR

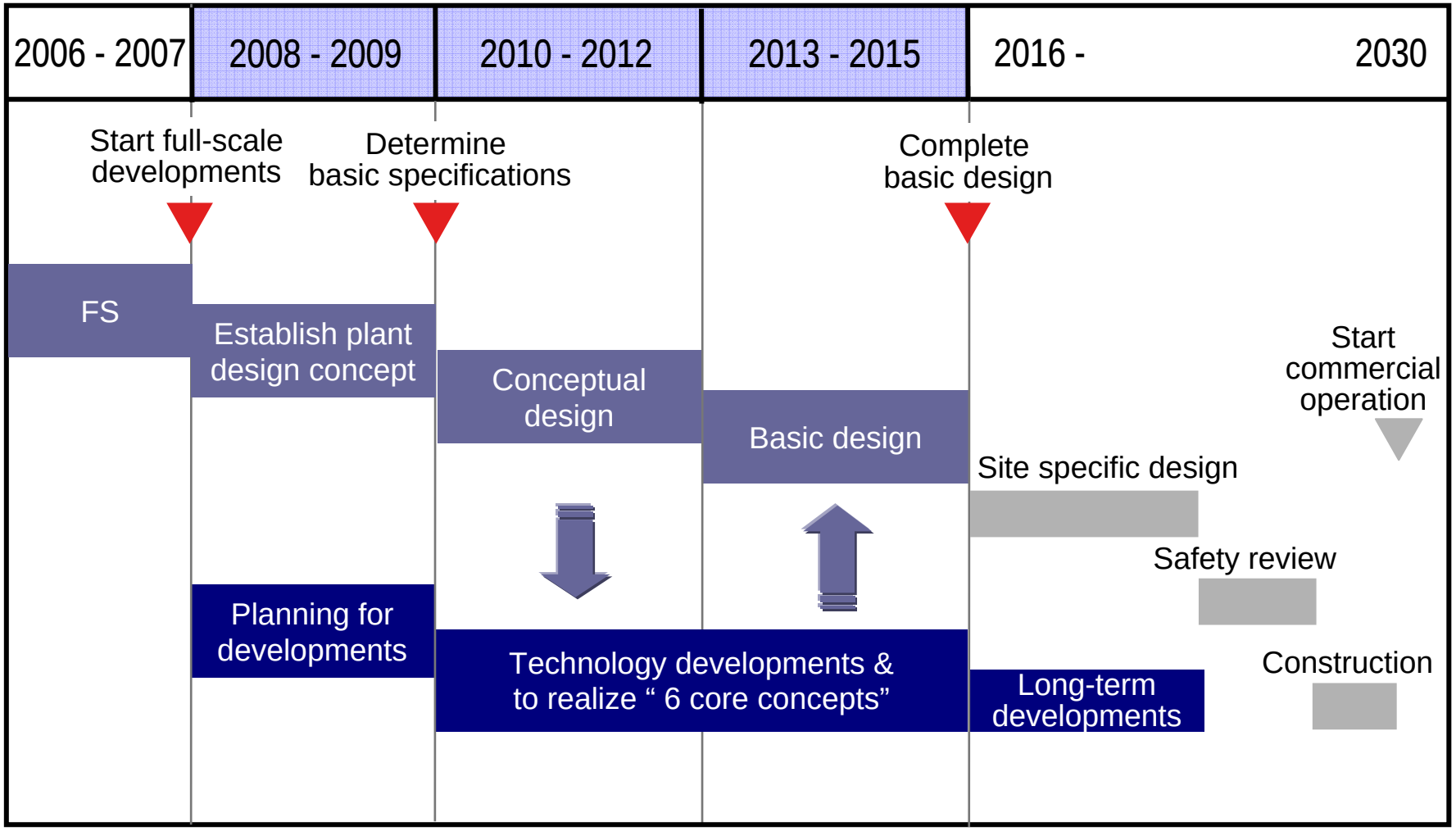
World Leading Digital Technology

Innovative Construction Technology

Seismic Isolation System

6 Major Concepts of Next-Generation LWR

Next Generation LWR development Program in Japan – Schedule -



Next Generation LWR development Program in Japan
– Schematic view for above 5wt% and Actual Utilization –

■Competitive Nuclear Power Generation by Next Generation LWR

- ➢Superior Plant Availability as base Electric Power Source
- ➢Competitive Fuel Cycle Cost
- ➢Lower Spent Fuel Reduction

■Achievement Both Longer Cycle (**24EFPM**) and Higher burnup (**70 GWd/t**)

■Introduction of **above 5wt% enrichment** Fuel Cycle and Fuel

Fuel Cycle Capability

■Technical Compatibility
- •Fuel Cycle Facility, Reactor
- •Fuel Cladding

■Business Consistency
- •Superiority of Fuel Cycle Cost
- •User Needs, Supplier Vision
- •Cost of Licensing
- •Historical Inevitability

Fuel Procurement Potential

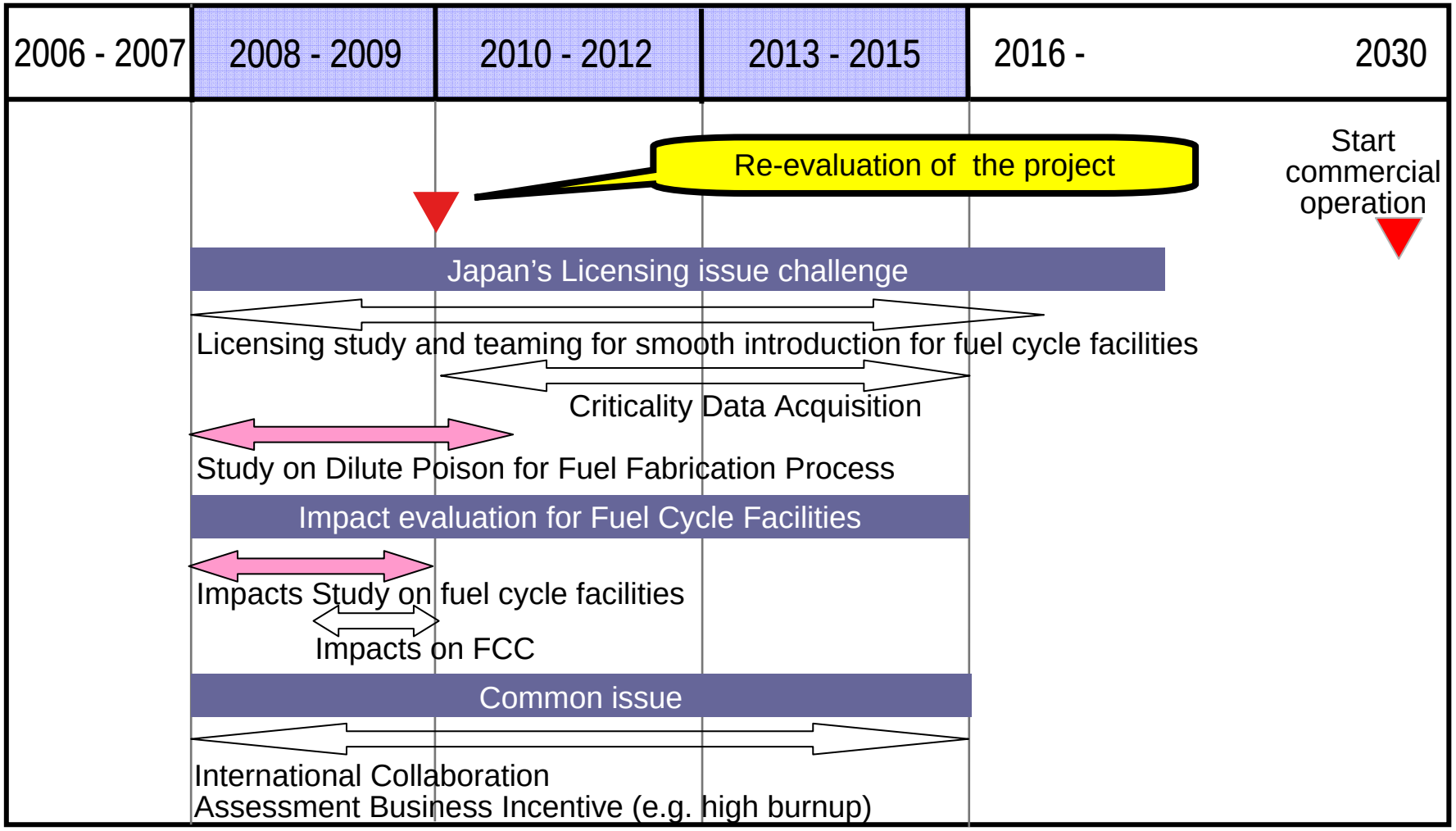
■Enriched Uranium Procurement
- •Infrastructure (enrichment, cask,)
- •Regulation

Regulation Issue and International Collaboration

■Fuel Fabrication Domain
- •Japan' Domestic regulation
- •Criticality DB acquisition

■Storage, Transportation Domain

■International Collaboration
- •Technical Discussion in Workshop
- •ICSBEP

Next Generation LWR development Program in Japan

- Sub master Plan for above 5wt% projects -