

GE ABWR & ESBWR

Jeff Suggs

ESBWR I&C

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imagination at work

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GE Energy

Gas



Cleaner Coal



Hydro



Nuclear



Wind



Solar



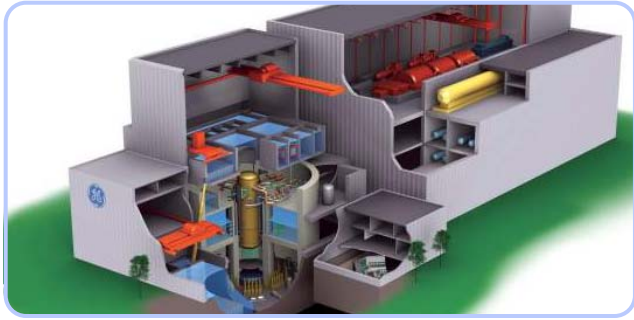
Biomass



Fuel Cells

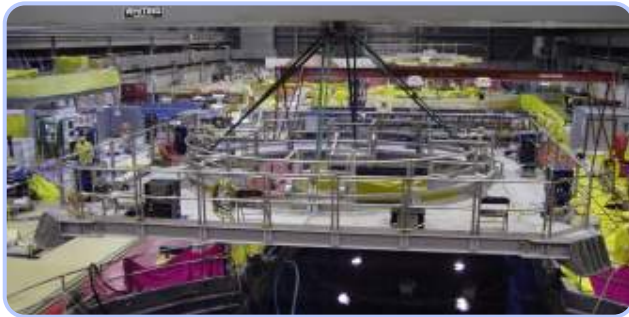


GE in Nuclear



Nuclear Power Plants

- ABWR
- ESBWR
- Gen IV



Services

- Reactor & Field Services
- Performance Services



Fuel

- GNF

BWR Activity Today ...



Lungmen ABWR Construction



ABWRs Being Built in Japan

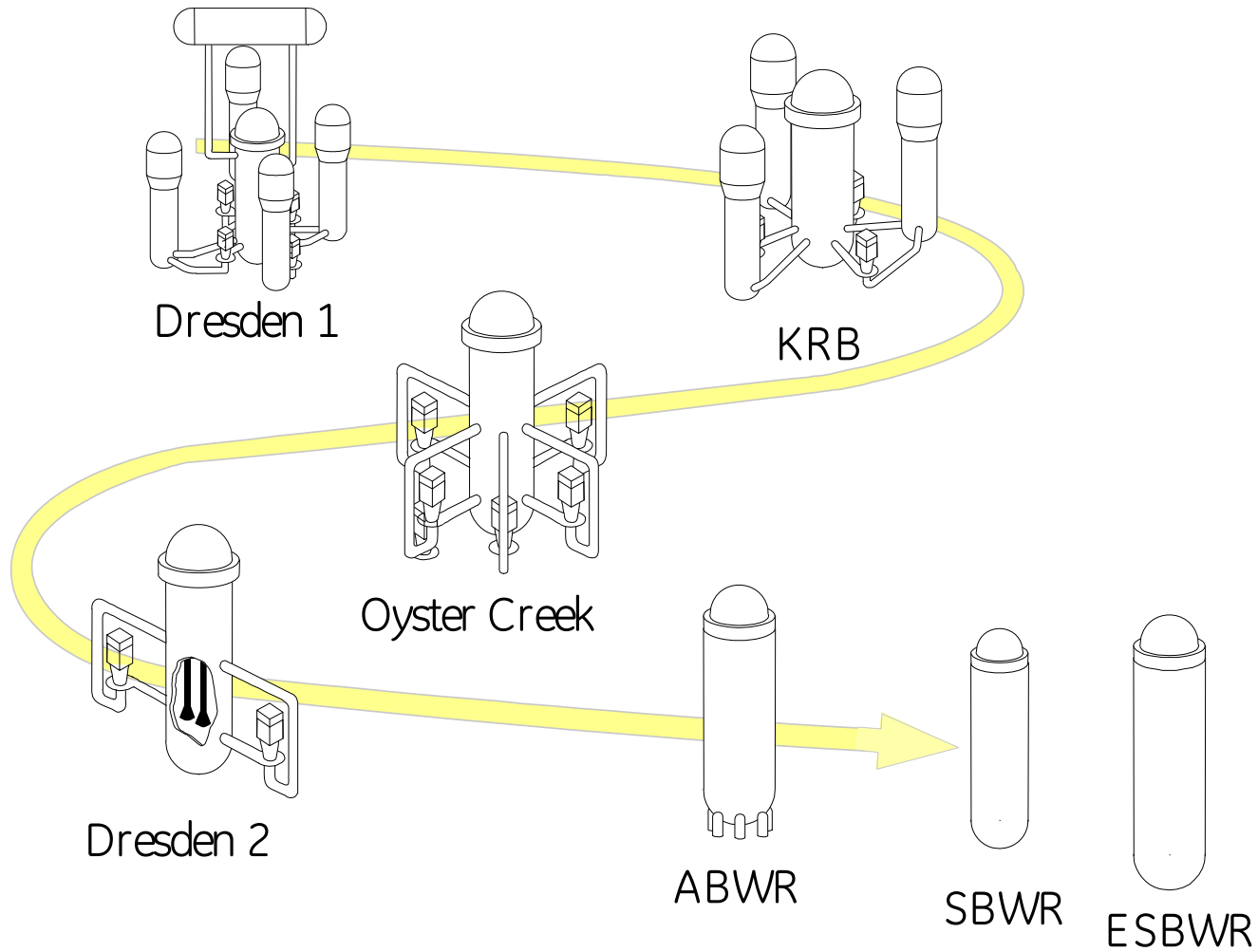


Lungmen Simulator in San Jose

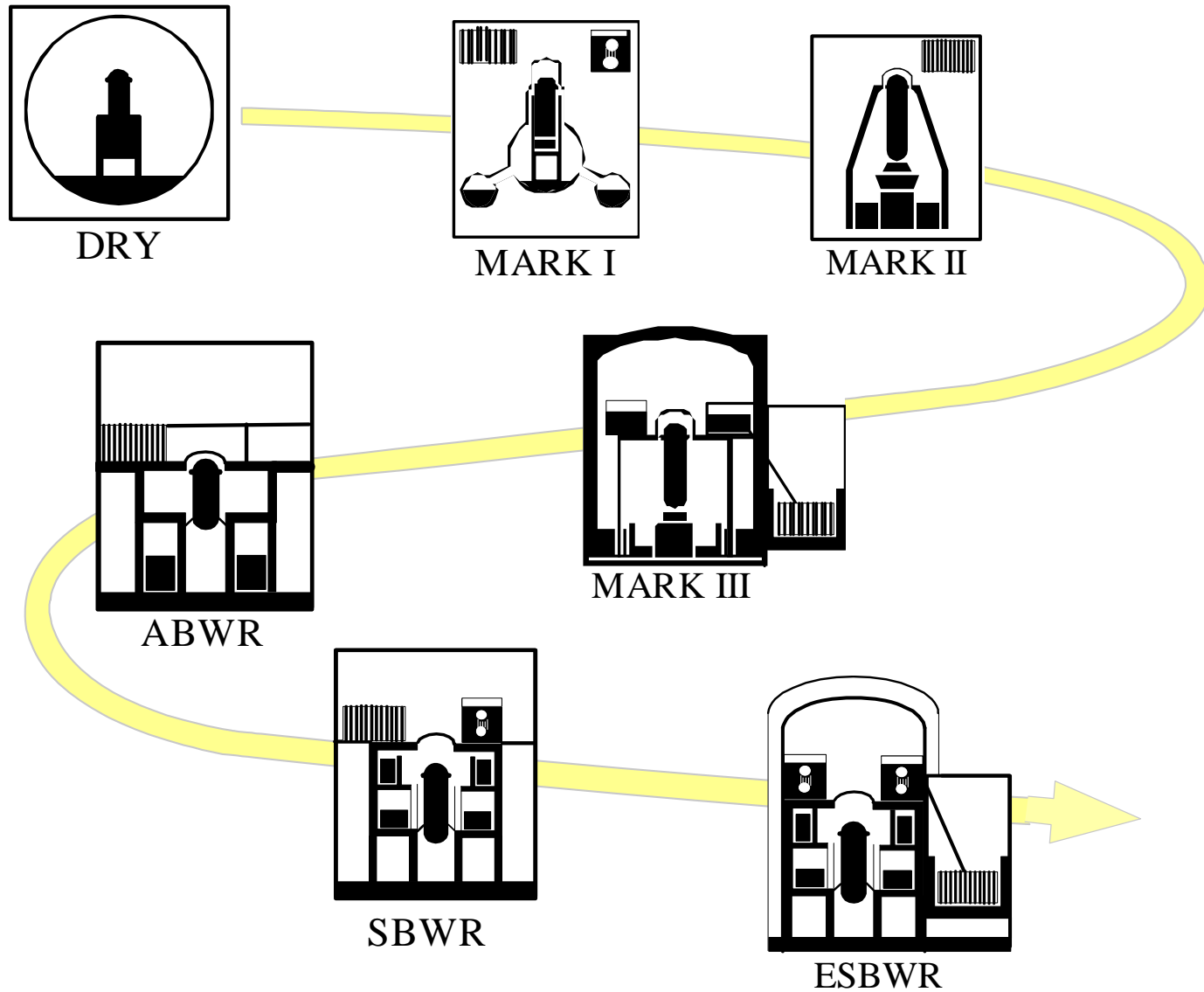


DOE NP-2010 ... NuStart & Dominion

BWR Evolution

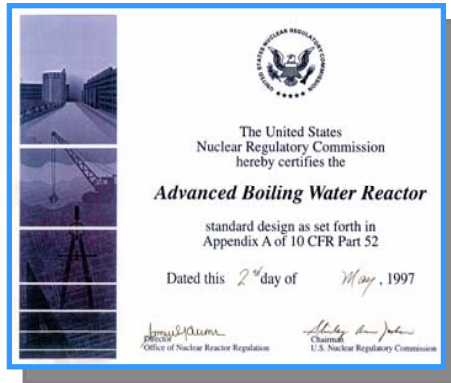


Containment Evolution



Advanced nuclear power ... ABWR

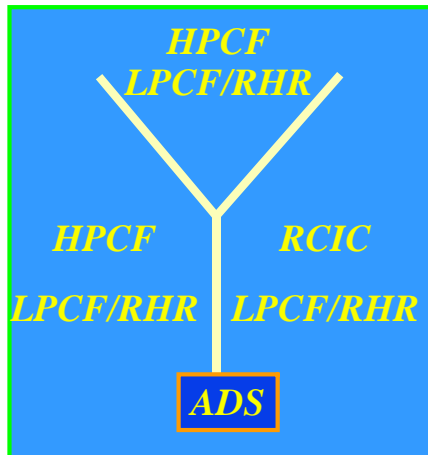
Key Features



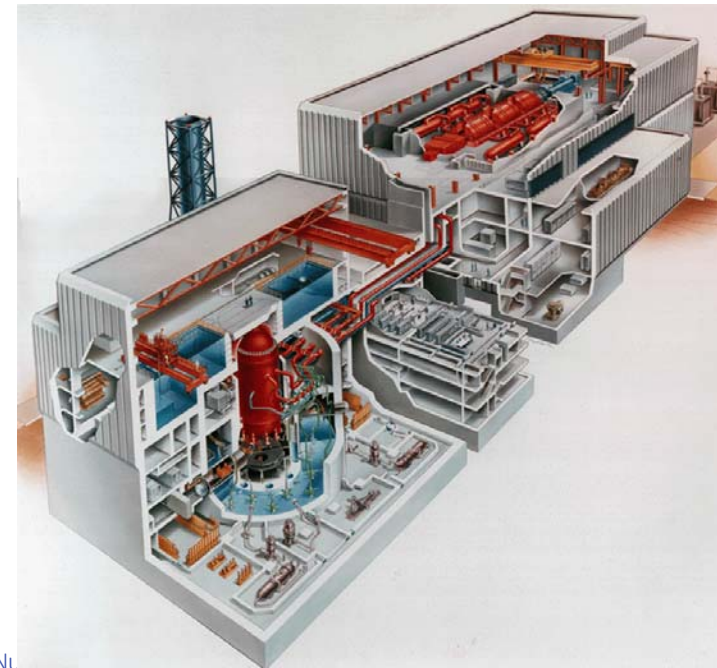
- Mature Design
- 1300 MWe Class
- Standard / Modular

Deployment

- NRC Design Certified
- Part of the US DOE 2010 Program
- Ready to Deploy for 2007 COL applications

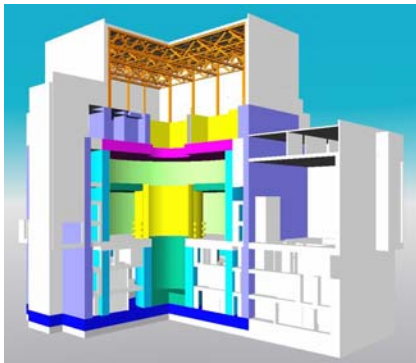


- Improved safety
- Active design
- Lower O&M burden



Advanced nuclear power ... ESBWR

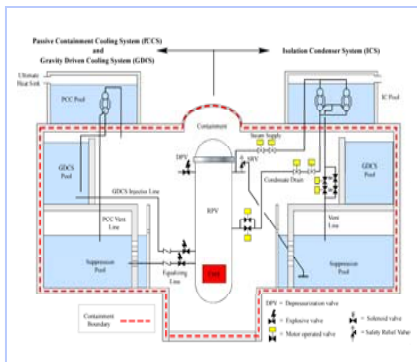
Key Features



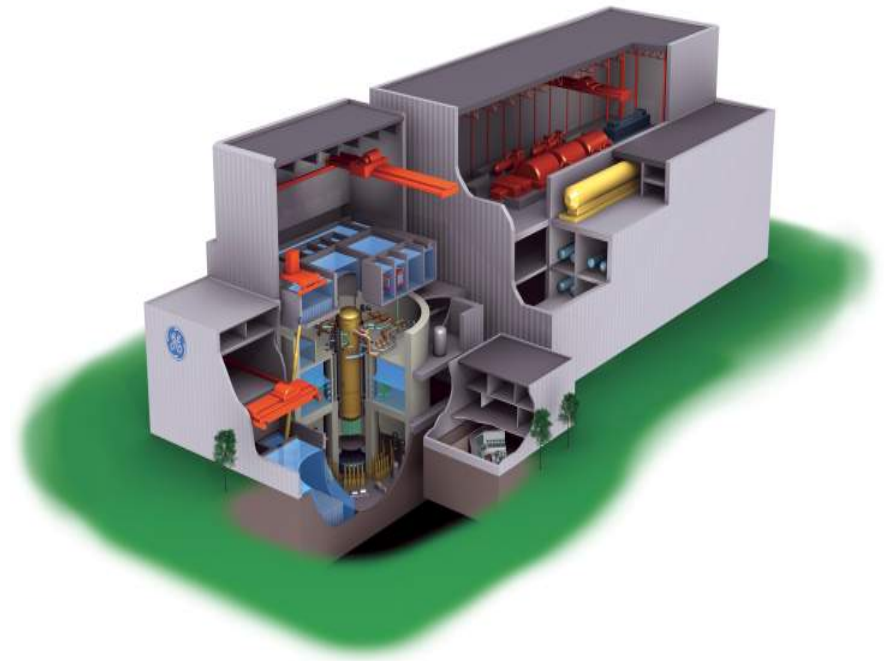
- Simplified Design
- 1500 MWe Class
- Standard / Modular

Deployment

- NRC DC submission complete
- Part of the US DOE 2010 Program
- On plan for 2007 COL applications



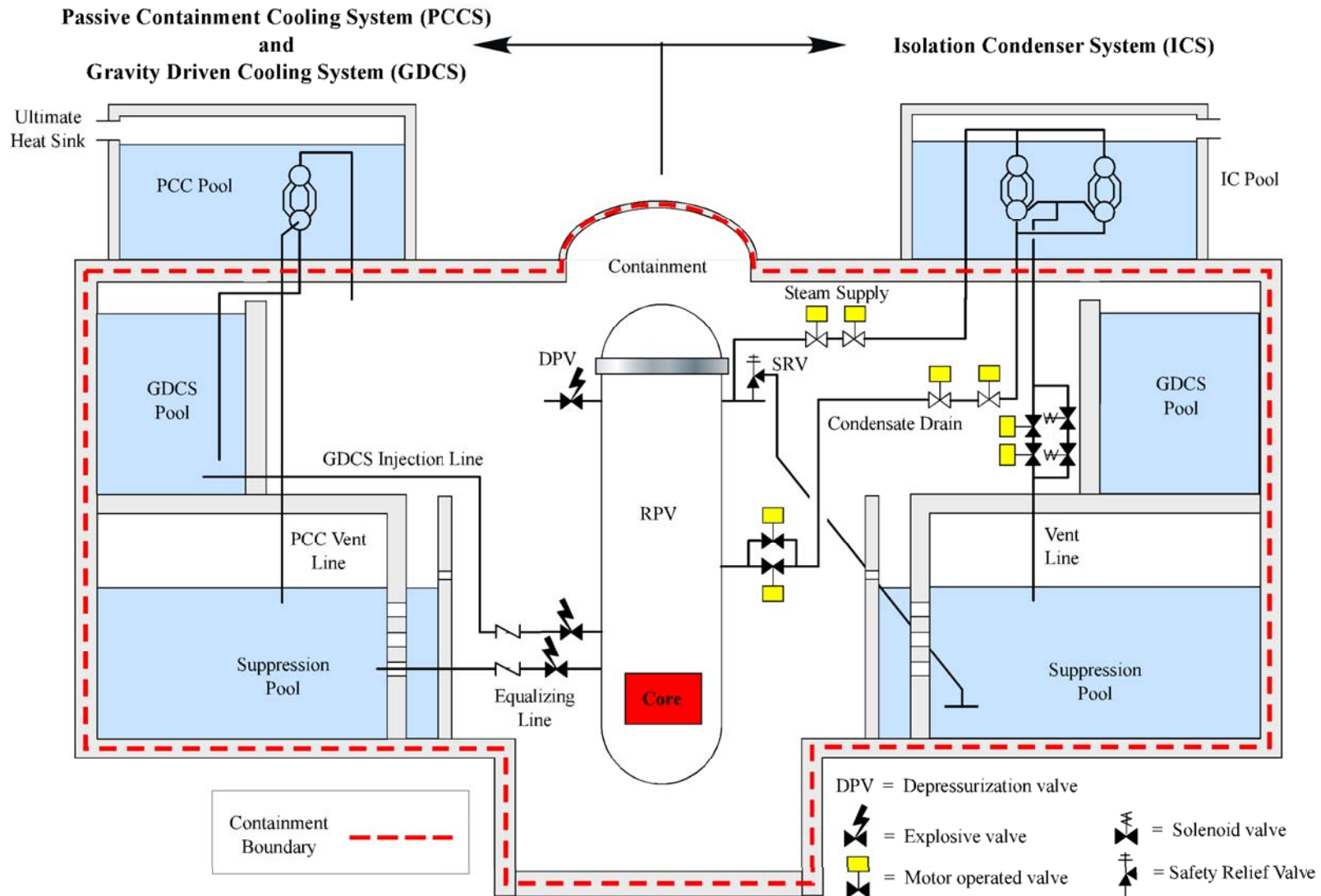
- Improved safety
- Passive design
- Lower O&M burden



What's different about ESBWR

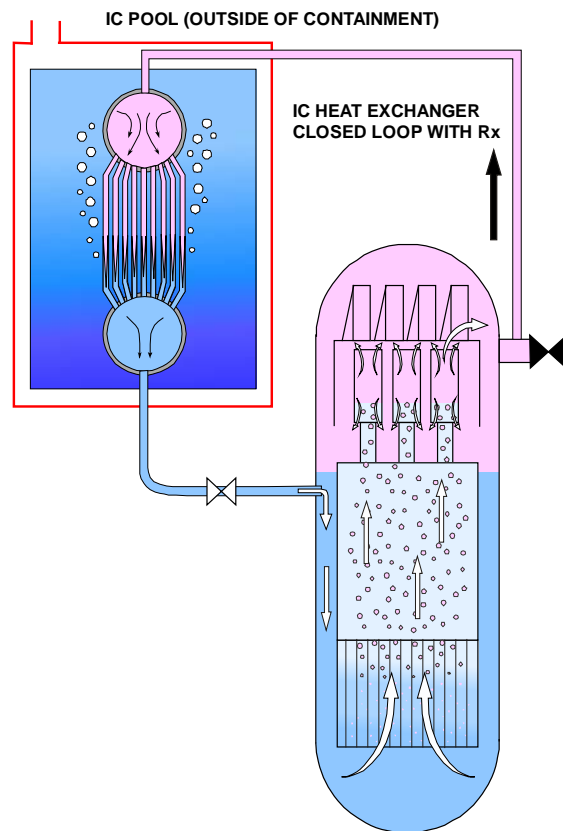
ABWR	ESBWR
Recirculation System + support systems	Eliminated (Natural Circulation)
HPCF (High Pressure Core Flooder) (2 each)	Combined all ECCS into one Gravity Driven Cooling System (4 divisions)
LPFL (Low Pressure Core Flooder) (3 each)	
RCIC (Isolation/Hi-Pressure small break makeup)	Replaced with IC heat exchangers (isolation) and CRD makeup (small break makeup)
Residual Heat Removal (3 each) (shutdown cooling & containment cooling)	Non-safety shutdown cooling, combined with cleanup system; Passive Containment Cooling
Standby Liquid Control System-2 pumps	Replaced SLCS pumps with accumulators
Reactor Building Service Water (Safety Grade) and Plant Service Water (Safety Grade)	Made non-safety grade - optimized for Outage duration
Safety Grade Diesel Generators (3 each)	Eliminated - only 2 non-safety grade diesels

Passive Safety ...

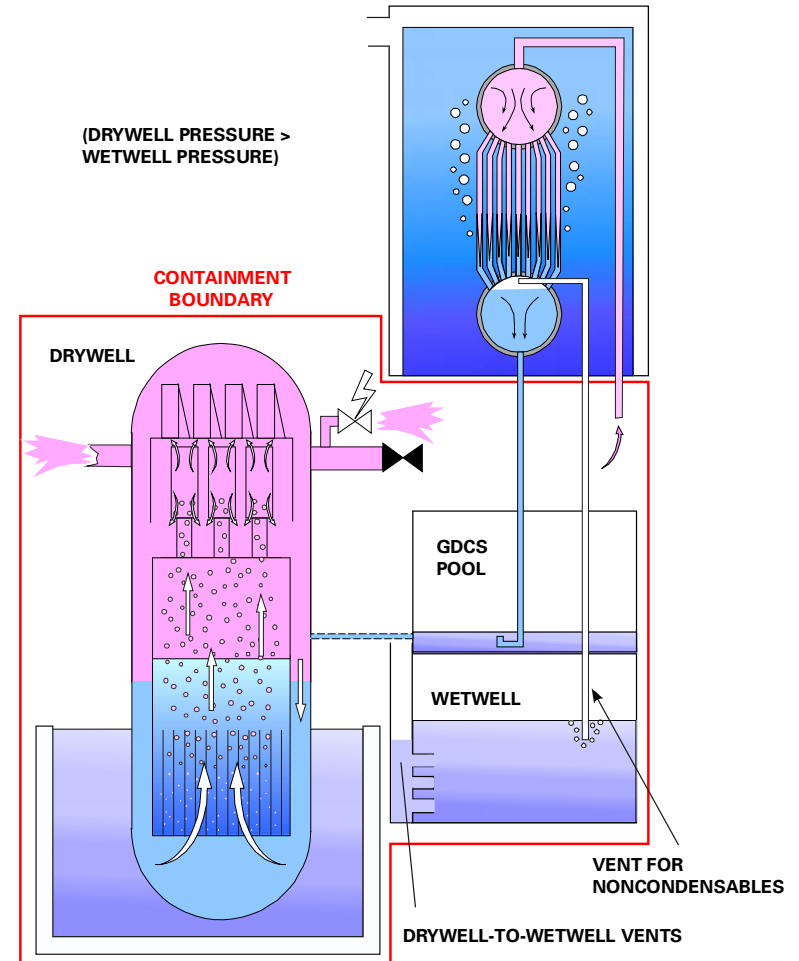


Passive Safety Systems ...

Isolation Condenser System



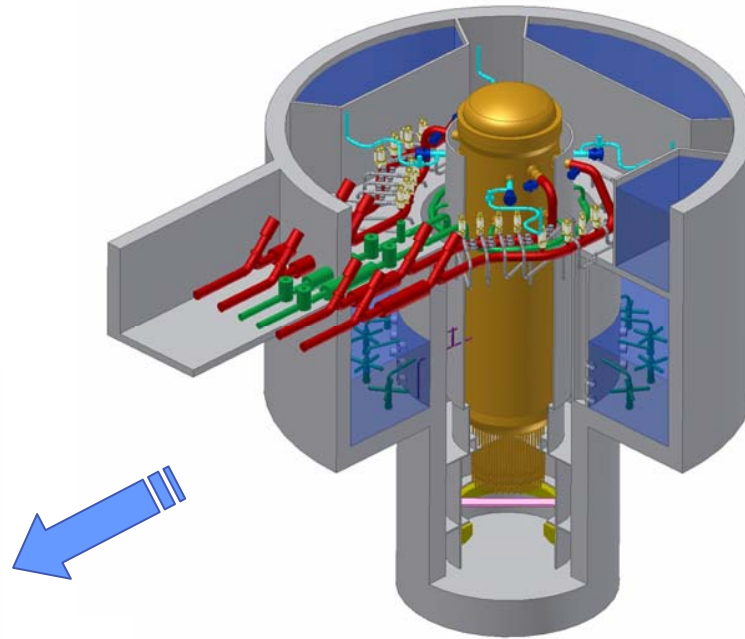
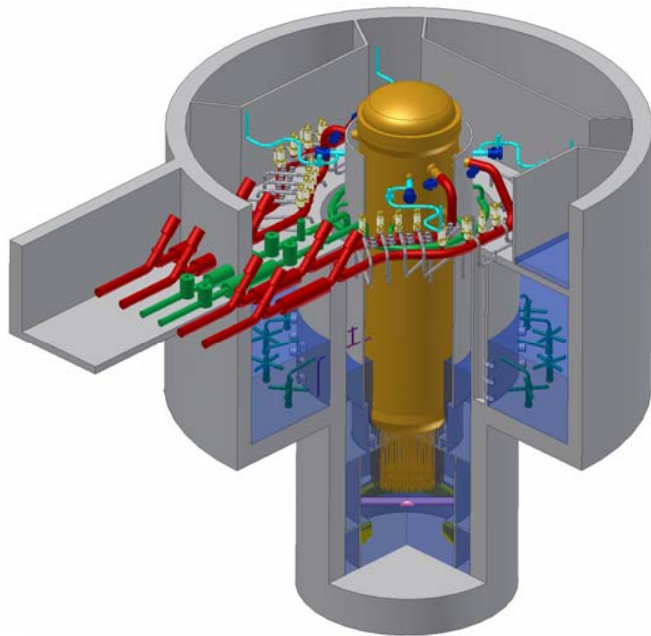
Passive Containment Cooling



Gravity Driven Cooling System ...

Simple design
Simple analyses

Extensive testing
Large safety margins

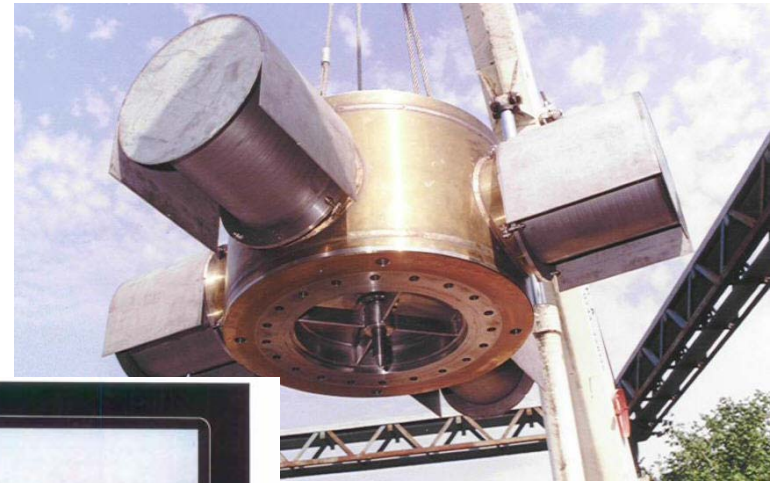


Gravity driven flow keeps core covered



Reactor Depressurization Valve in the Test Facility

ESBWR New Features



VB

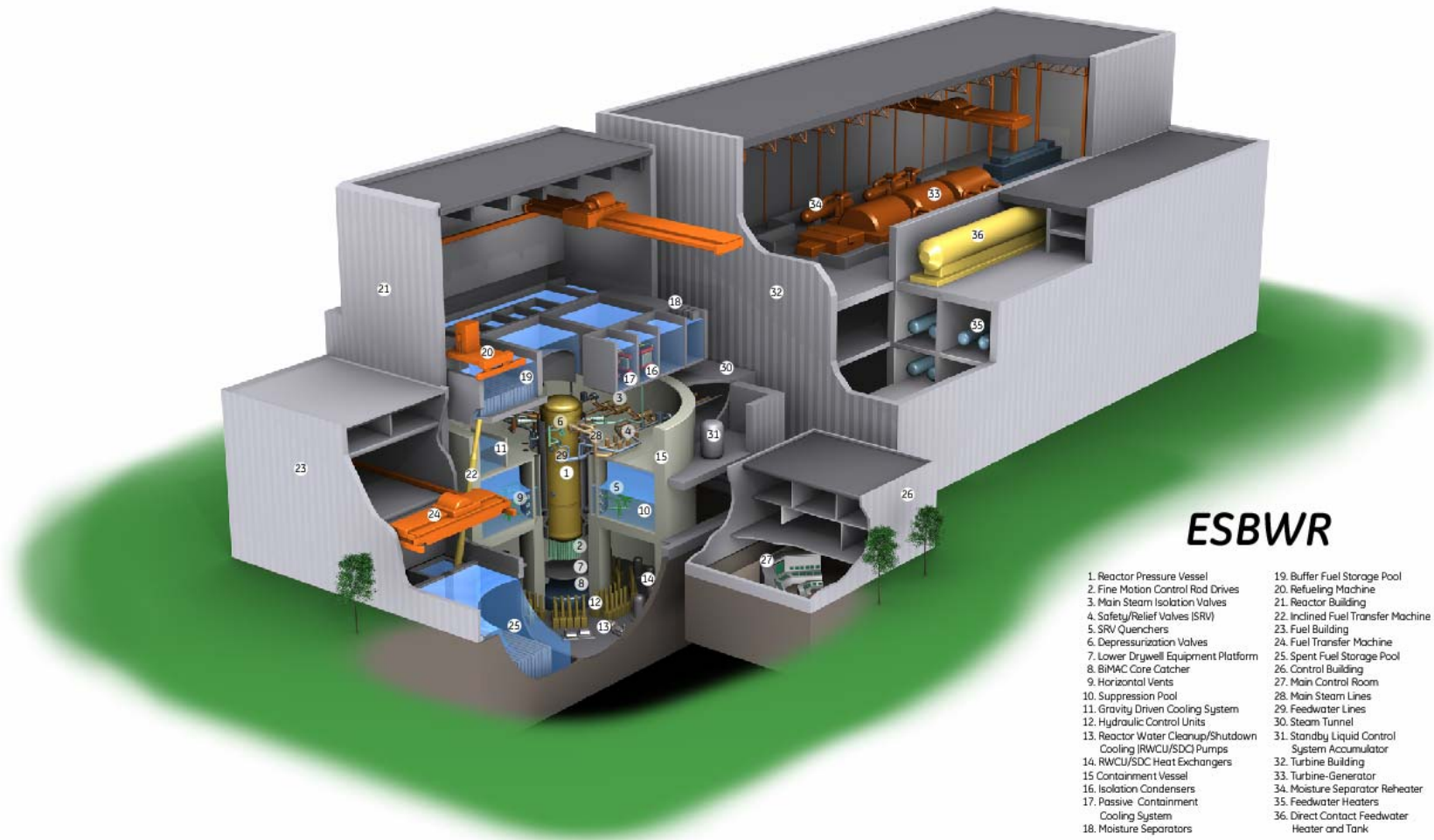


GDSCS



PCCS

ESBWR 3D Cutaway



- ESBWR**
- | | |
|---|---|
| 1. Reactor Pressure Vessel | 19. Buffer Fuel Storage Pool |
| 2. Fine Motion Control Rod Drives | 20. Refueling Machine |
| 3. Main Steam Isolation Valves | 21. Reactor Building |
| 4. Safety/Relief Valves (SRV) | 22. Inclined Fuel Transfer Machine |
| 5. SRV Quenchers | 23. Fuel Building |
| 6. Depressurization Valves | 24. Fuel Transfer Machine |
| 7. Lower Drywell Equipment Platform | 25. Spent Fuel Storage Pool |
| 8. BiMAC Core Catcher | 26. Control Building |
| 9. Horizontal Vents | 27. Main Control Room |
| 10. Suppression Pool | 28. Main Steam Lines |
| 11. Gravity Driven Cooling System | 29. Feedwater Lines |
| 12. Hydraulic Control Units | 30. Steam Tunnel |
| 13. Reactor Water Cleanup/Shutdown Cooling (RWCU/SDC) Pumps | 31. Standby Liquid Control System Accumulator |
| 14. RWCU/SDC Heat Exchangers | 32. Turbine Building |
| 15. Containment Vessel | 33. Turbine-Generator Reheater |
| 16. Isolation Condensers | 34. Moisture Separator Reheater |
| 17. Passive Containment Cooling System | 35. Feedwater Heaters |
| 18. Moisture Separators | 36. Direct Contact Feedwater Heater and Tank |

GE Environmental & Seismic Qualification

Standard Requirements & Guidelines

- 10 CFR 50.49
- Reg. Guide 1.89
- Reg. Guide 1.100
- IEEE Std 323
- IEEE Std 344
- NUREG-0588
- SRP 3.10
- SRP 3.11

GE Environmental & Seismic Qualification

Qualification Basis

- Reference Plant (Lungmen)

Evolution of Regulatory Guidance

Passive (ESBWR) versus Active (ABWR) Plant Differences

Passive versus Active Plant

Environmental Differences – DBA Conditions

- Safe shutdown versus cold shutdown
- Containment long term pressure & temperature
- Reactor, Fuel & Control Buildings HVAC

Final Thoughts ... the dawn of a Renaissance?



- Industry trends positive ... nuclear energy proven and key part of energy portfolio
- Geopolitical trends, energy policy and environmental needs support nuclear
- New technology investments will drive continued performance improvements
- Next generation reactor designs ... address public perception & economics
- GE is investing in our future ... People, Processes and Products
- GE is Committed to Nuclear and the ESBWR future