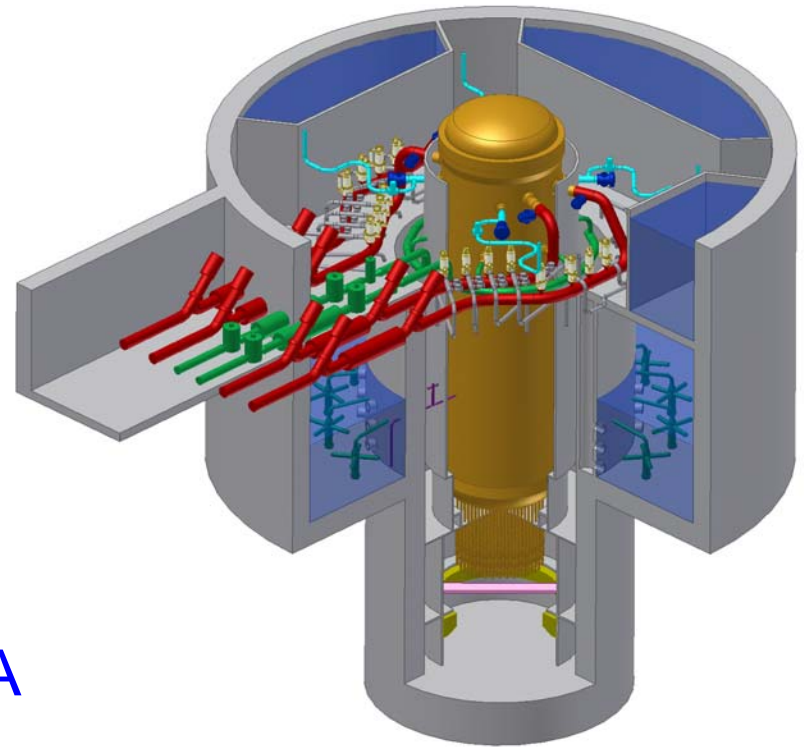


ESWR Probabilistic Risk Assessment

Richard Wachowiak
GE-Hitachi Nuclear Energy
Technical Lead for ESBWR PRA

Presented to USNRC July 18, 2007



Purpose of Design PRA

CDF goal ← Lower than existing plants
LRF goal ←

Dose at site boundary

DRAP

ITAAC

RTNSS

Evolution of a Design and PRA

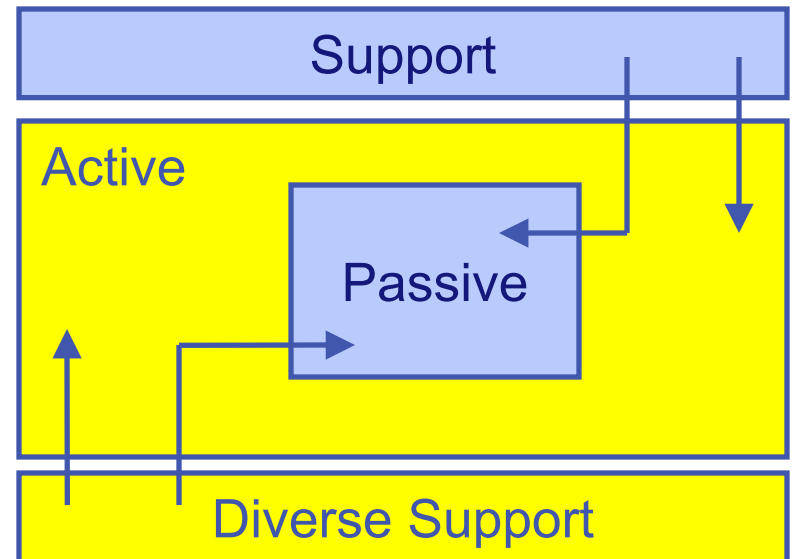
Conceptual Design	Design (DCD)	Detailed Design	Construction Design	Plant in Operation
Feasibility	Regulatory Analysis	Completion of Engineering	Assumptions Confirmed	Assumptions Confirmed
Major Functions Specified	Major Components Specified	All Components Specified	All Components Described	All Components Described
Qualitative Risk Assessment	Qualitative Quantitative PRA	Quantitative PRA with Gaps	Quantitative PRA with Fewer Gaps	As-Built As-Operated PRA
Defense-in-Depth Concepts	Defense-in-Depth Analysis	Defense-in-Depth Mostly Resolved	No Defense-in-Depth Issues	No Defense-in-Depth Issues
Past Vulnerabilities Addressed	Sequence Level Vulnerabilities Eliminated	System Level Vulnerabilities Eliminated	Component Level Vulnerabilities Eliminated	Additional Vulnerabilities Eliminated

← DCD / COLA Level of Design Detail

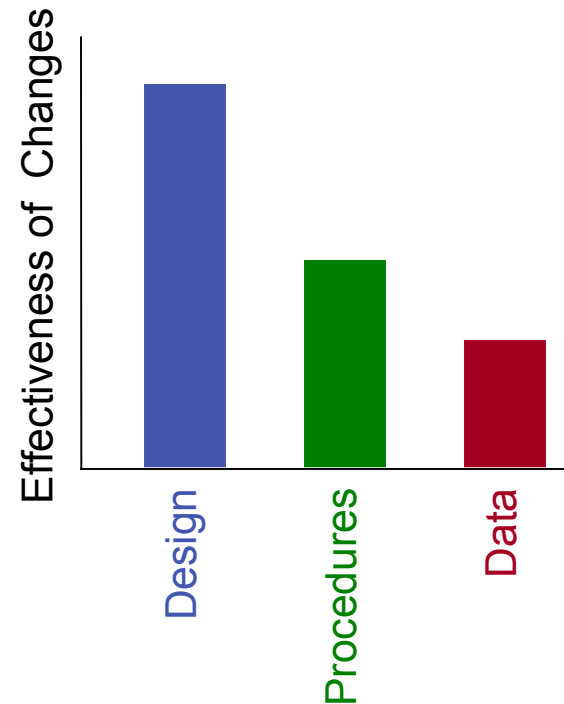
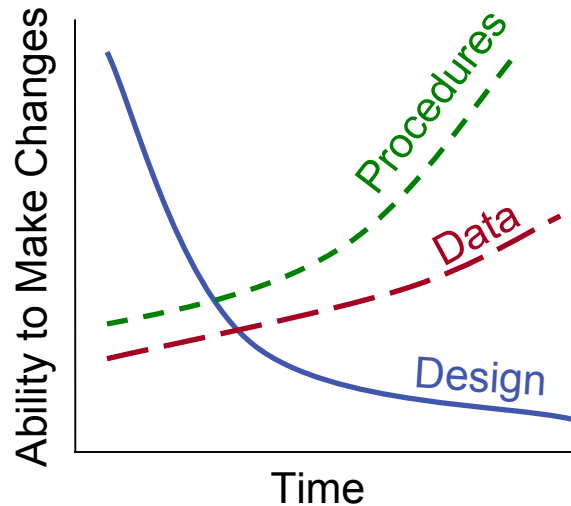
Example: Key Features of ESBWR Design Risk Management

Passive safety systems
Active asset protection systems
Support system diversity
Minimize reliance on human actions
Use historical data

Target configuration for
core damage prevention
functions



Three Chief Methods to Affect Risk

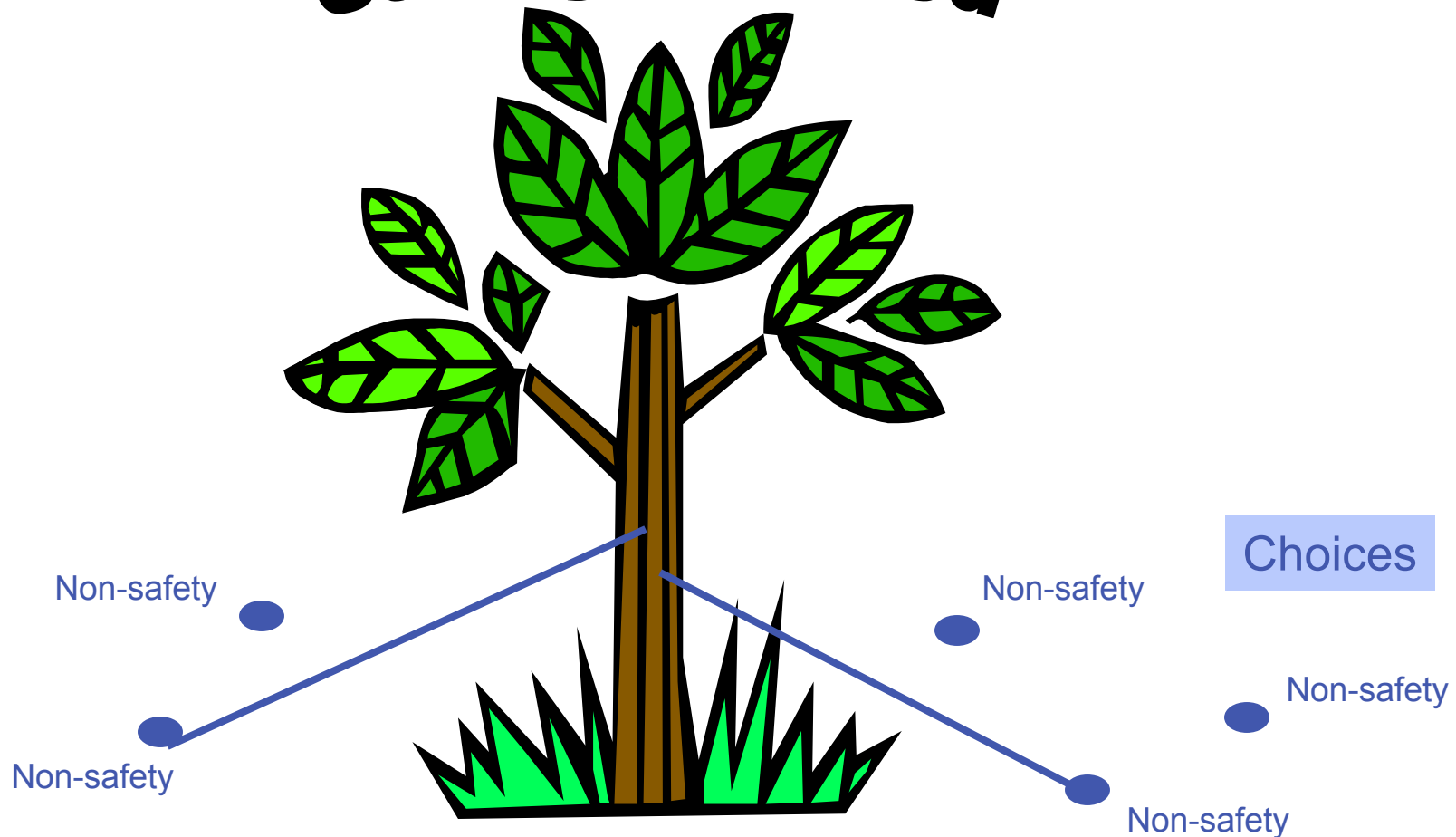


Using a PRA early provides maximum benefit

New Plant PRA

Safety Related

Basic Design



Goal

Design PRA needs to show “a way” to meet all goals

DRAP, RTNSS, ITAAC support this

It is not the only way

> Tier 1 should not lock in options