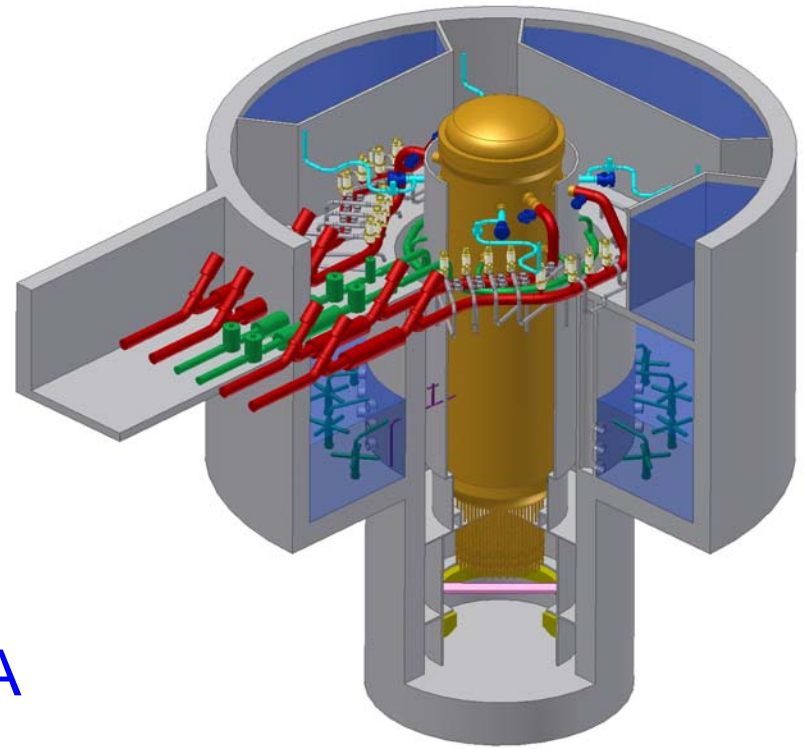


# ESWR Probabilistic Risk Assessment



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# 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

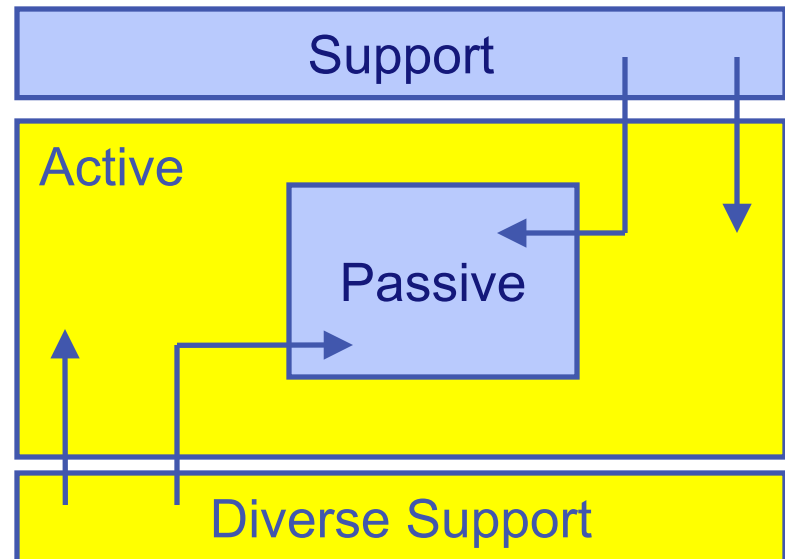
|                                |   |   |  |                                       |
|--------------------------------|---|---|--|---------------------------------------|
| Conceptual Design              | Design (DC)                               | Detailed Design                         | Construction 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

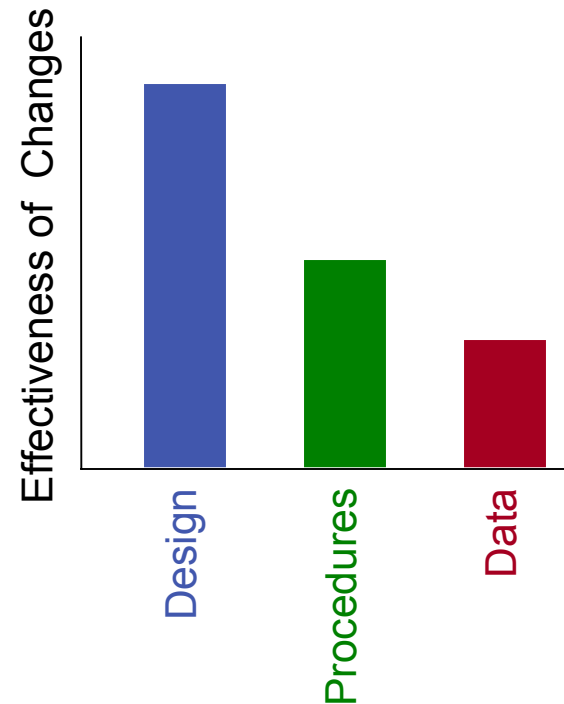
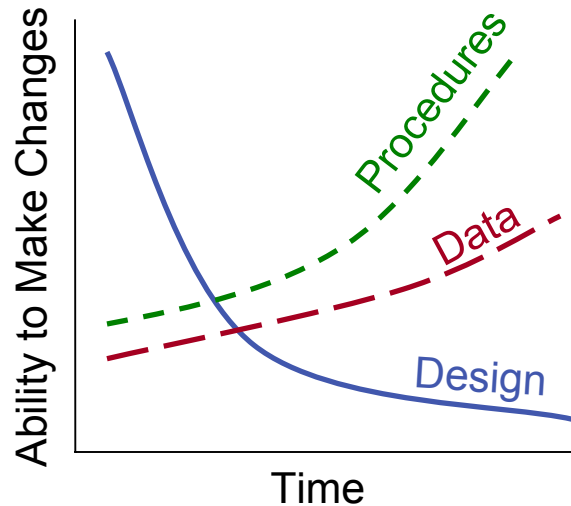
# Example: Key Features of ESBWR Design Risk Management

- 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

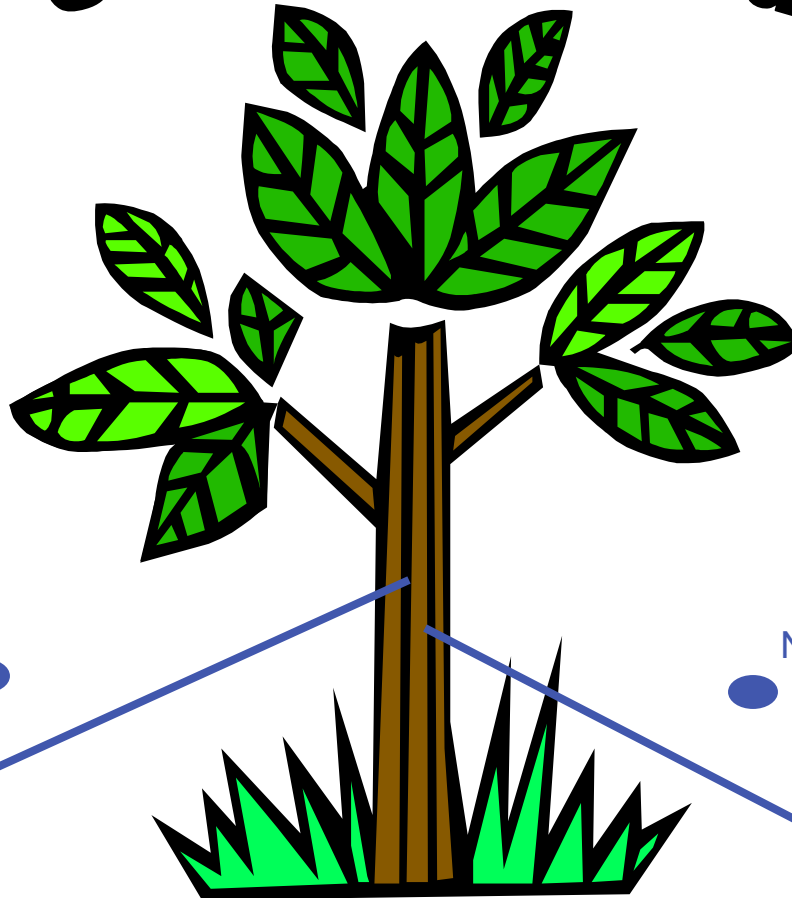


Using a PRA early provides maximum benefit

# New Plant PRA

## Safety Related

Basic Design



Choices

Non-safety

Non-safety

Non-safety

Non-safety

Non-safety

# 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