

**RISK MANAGEMENT  
AS APPLIED TO  
THE NEXT GENERATION OF  
REACTOR REGULATIONS**

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# Perspectives on Time

- For current plants with License Renewal any new structure will set the stage for the next 45 years
- For a new plant any new structure sets the scope for new design certifications with a 60 to 80 year Impact.
- There is time to consider all views and make very measured decisions.

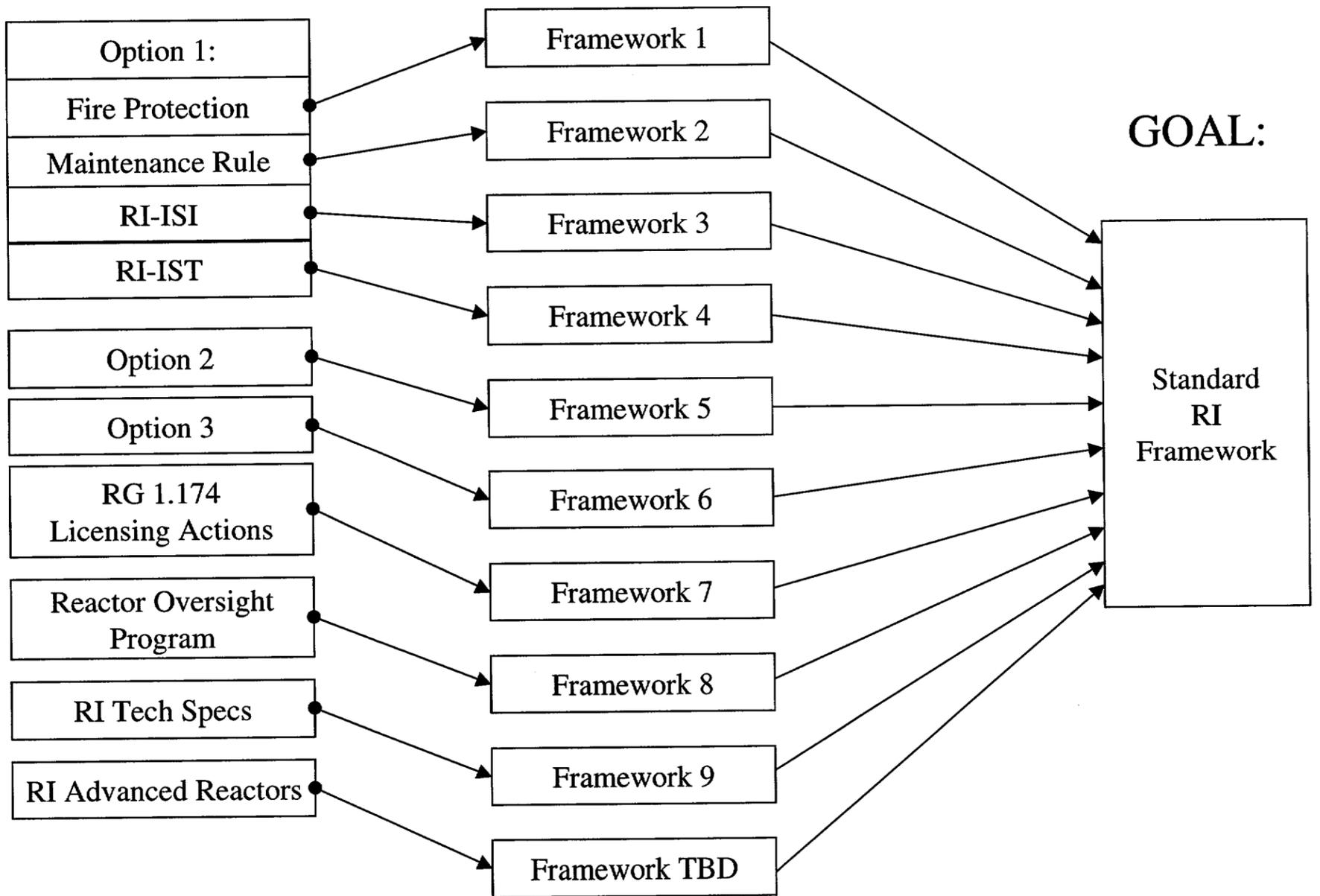
# Problem Definition

- Safety requirements are uneven
- Stakeholders have not been communicating
- Too many solutions to the same problem
- The process has not taken maximum advantage of evolving knowledge gains

# Supporting Data

- Operating Experience from the current reactors.
- Operating experience from other industrial applications.
- Data will be the corner stone for setting reliability objects.

# Risk-Informed Framework Convergence

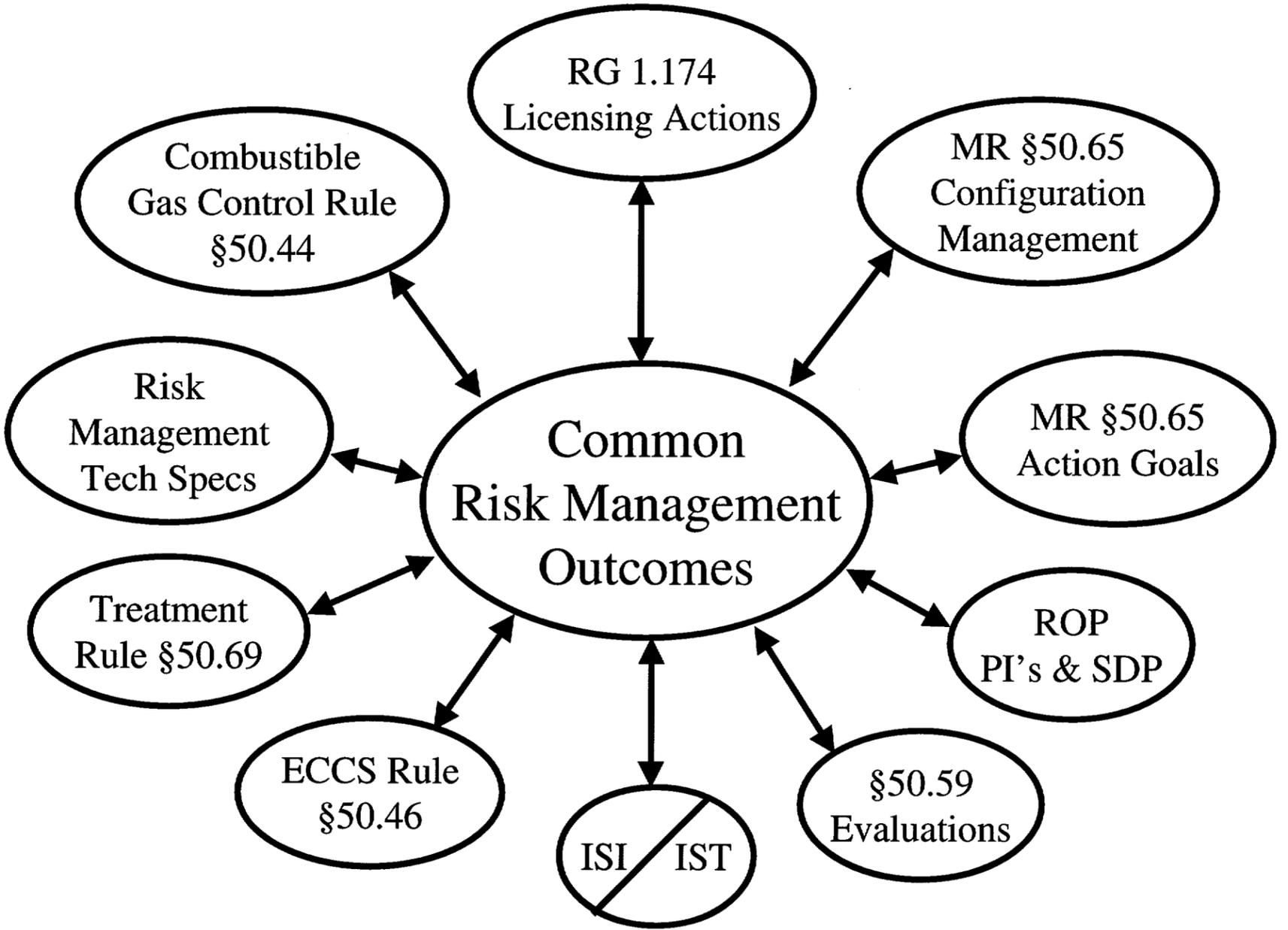


# Near term Goals

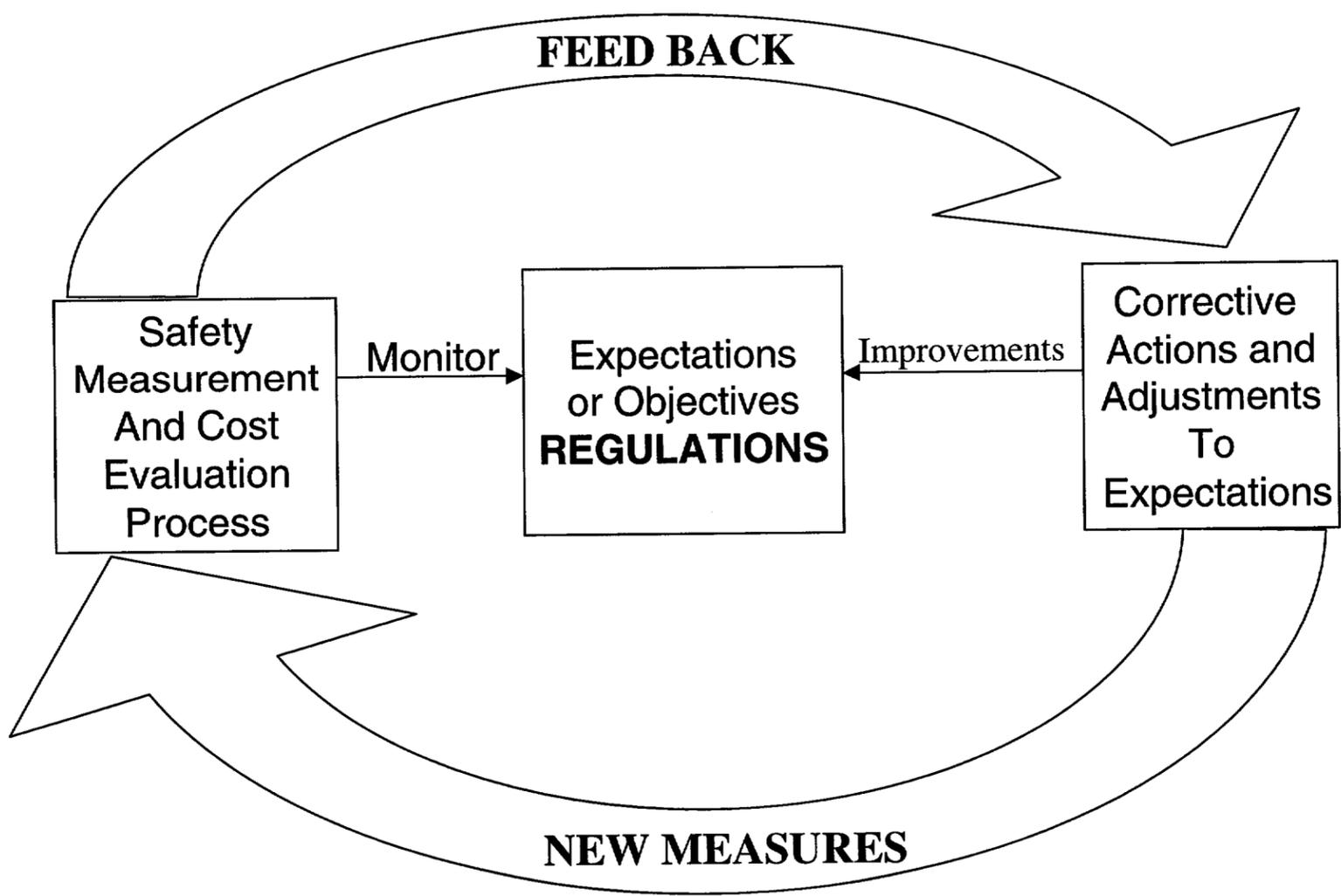
- Common objectives for activities
- Stakeholder buy-in
- Use of “risk-management” vs. “risk-informed ”

# Long Term Goal

Maintain the current high level of safety throughout the industry, while maximizing the licensee or applicants ability to make design, construction and operational decisions in a more open and transparent environment than currently exist.



# Outcome Driven Process



# Plan

- Structured, systematic framework that integrates:
  - Option 3 Framework
  - Advanced reactors
  - Convergence SRM
- Objectives for each cornerstone
- Focus on convergence

# Maintain CDF < 10E-4

Subsidiary Safety Goal (10E-4) = Expectation = Historical Basis

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Margin between real operation and NRC rules

Cumulative Effect of rules on accident prevention and mitigation

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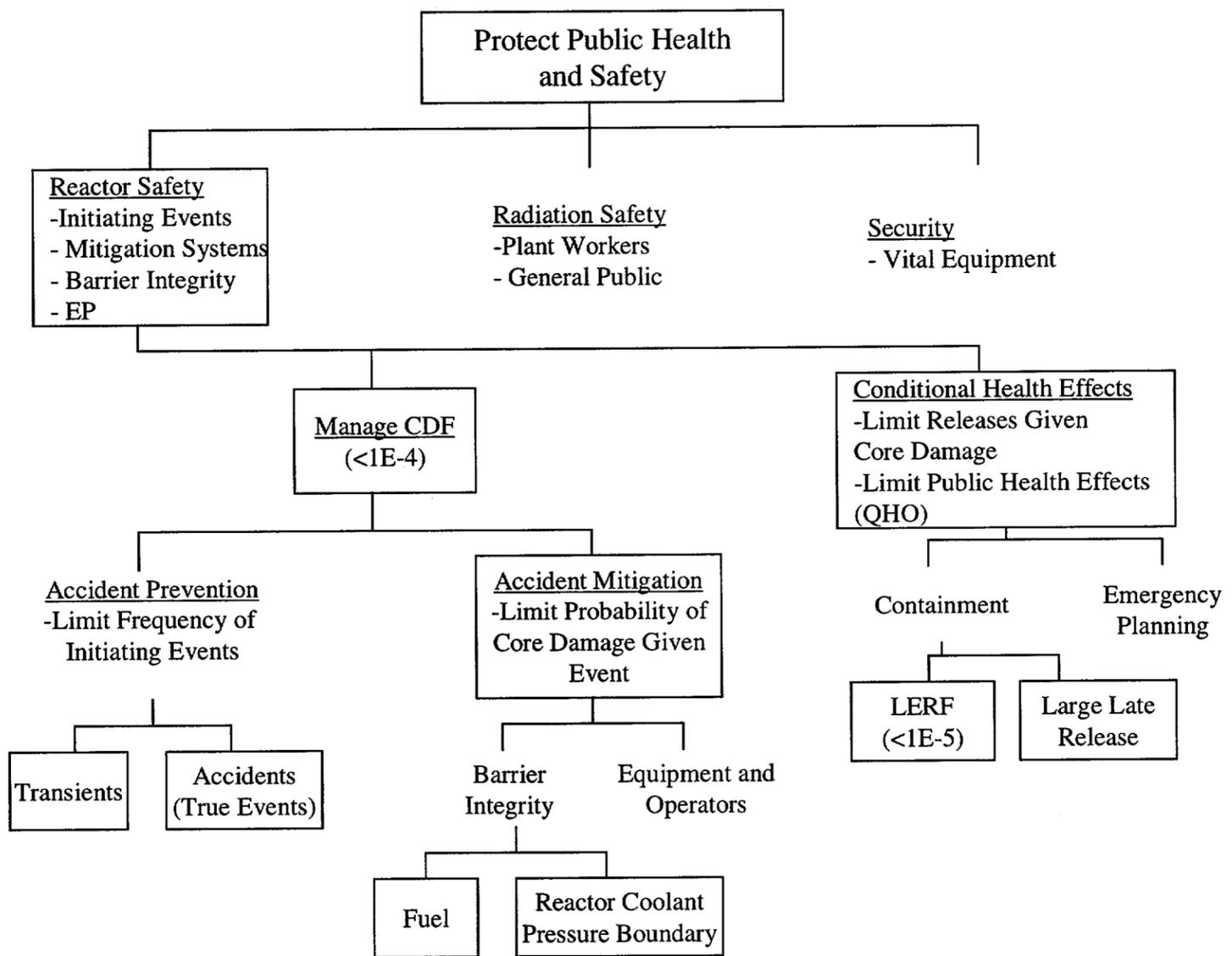
Margin between NRC rules and Adequate Protection

Adequate Protection

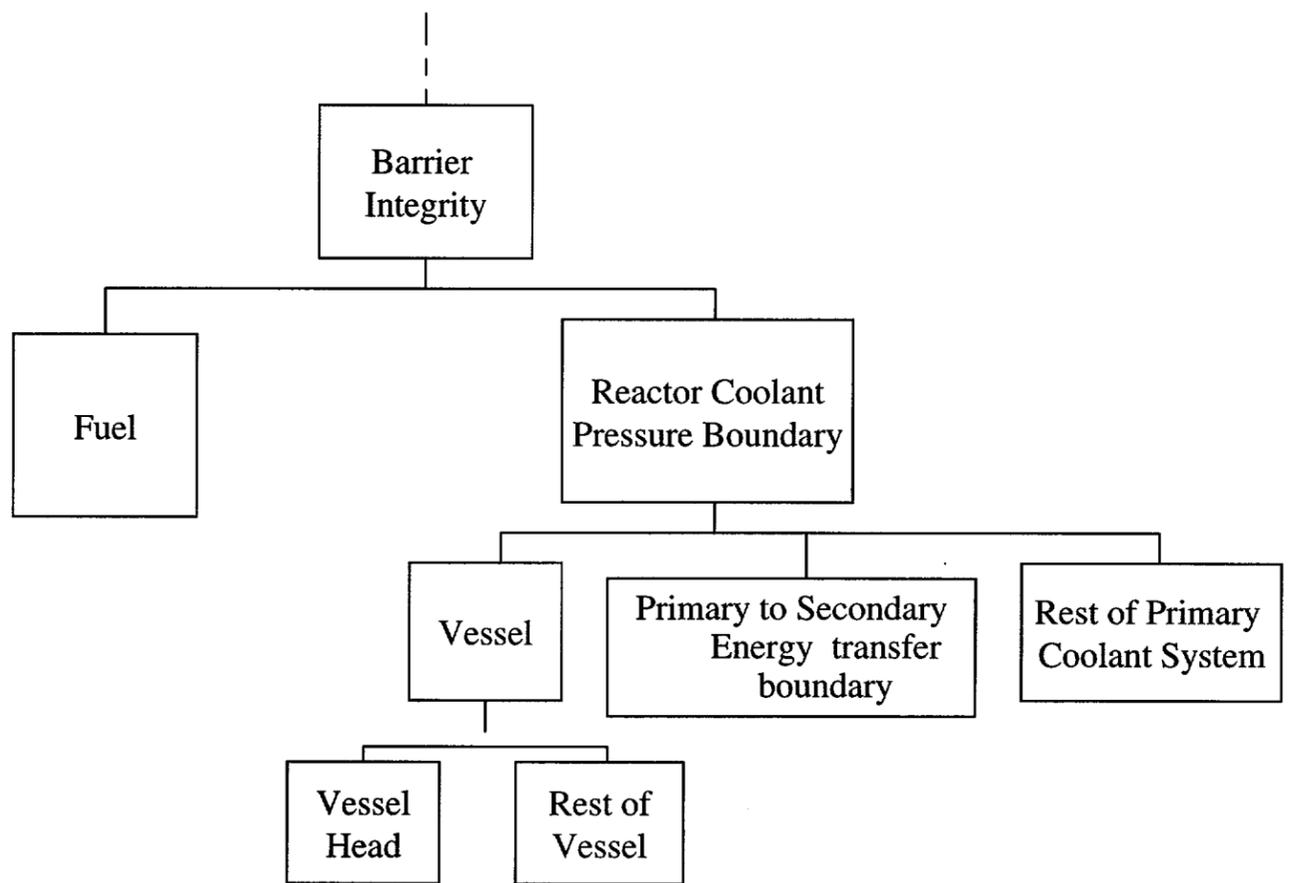
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# Develop Common Risk-Management Objectives



# Possible Stakeholder Interaction Result



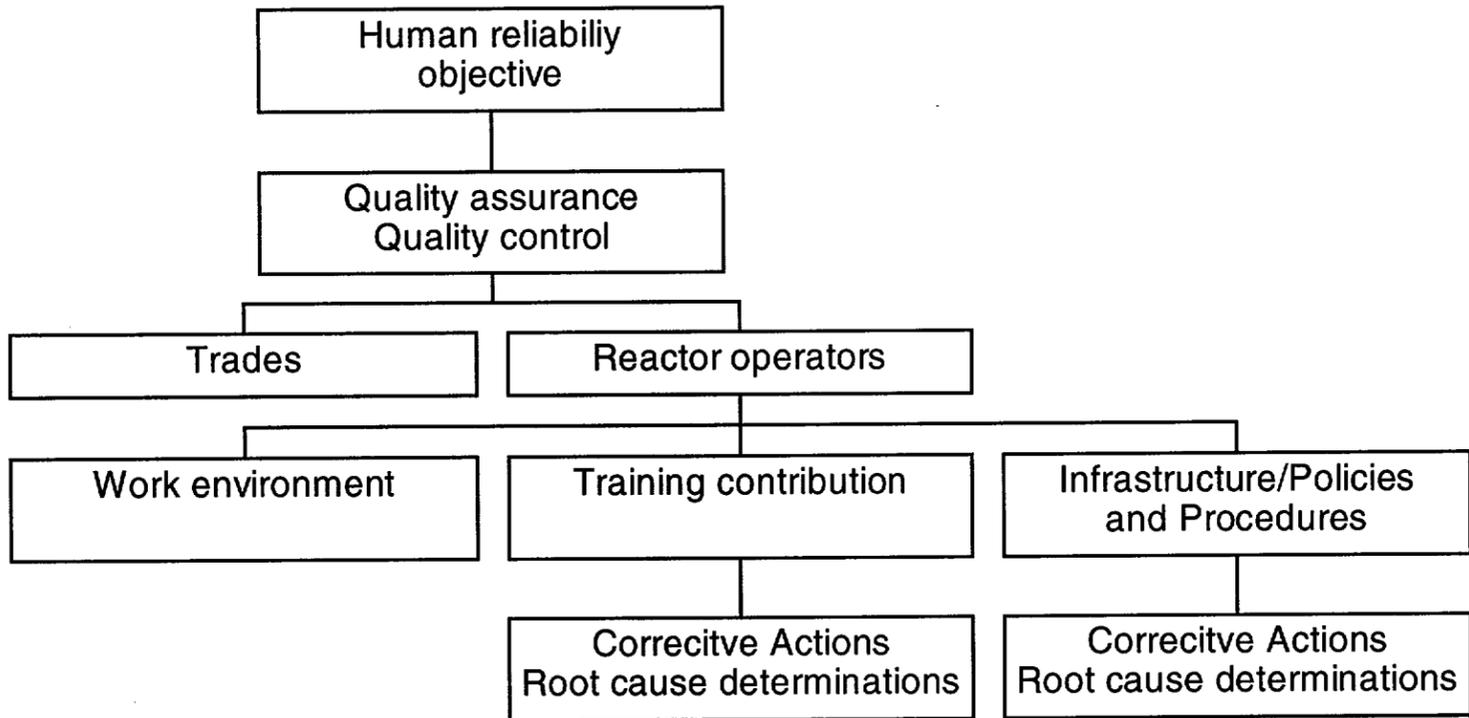
# Sample Objectives - Transients

- Current ROP
  - Limit frequency of those events that upset plant stability and challenge critical safety functions, during shutdown as well as power operations...
- RBPI
  - General transient frequency  $< .96/\text{yr}$
  - Loss of feedwater  $< 6.8\text{E-}2/\text{yr}$

# Human System

- Just as a hierarchical structure is purposed for the plant hardware systems and interfaces the human as a system has to be addressed.
- This should support the assumptions used in the risk analysis.
- The lack of certainty may call for the continuation program requirements versus objective ones

# Normal Human System



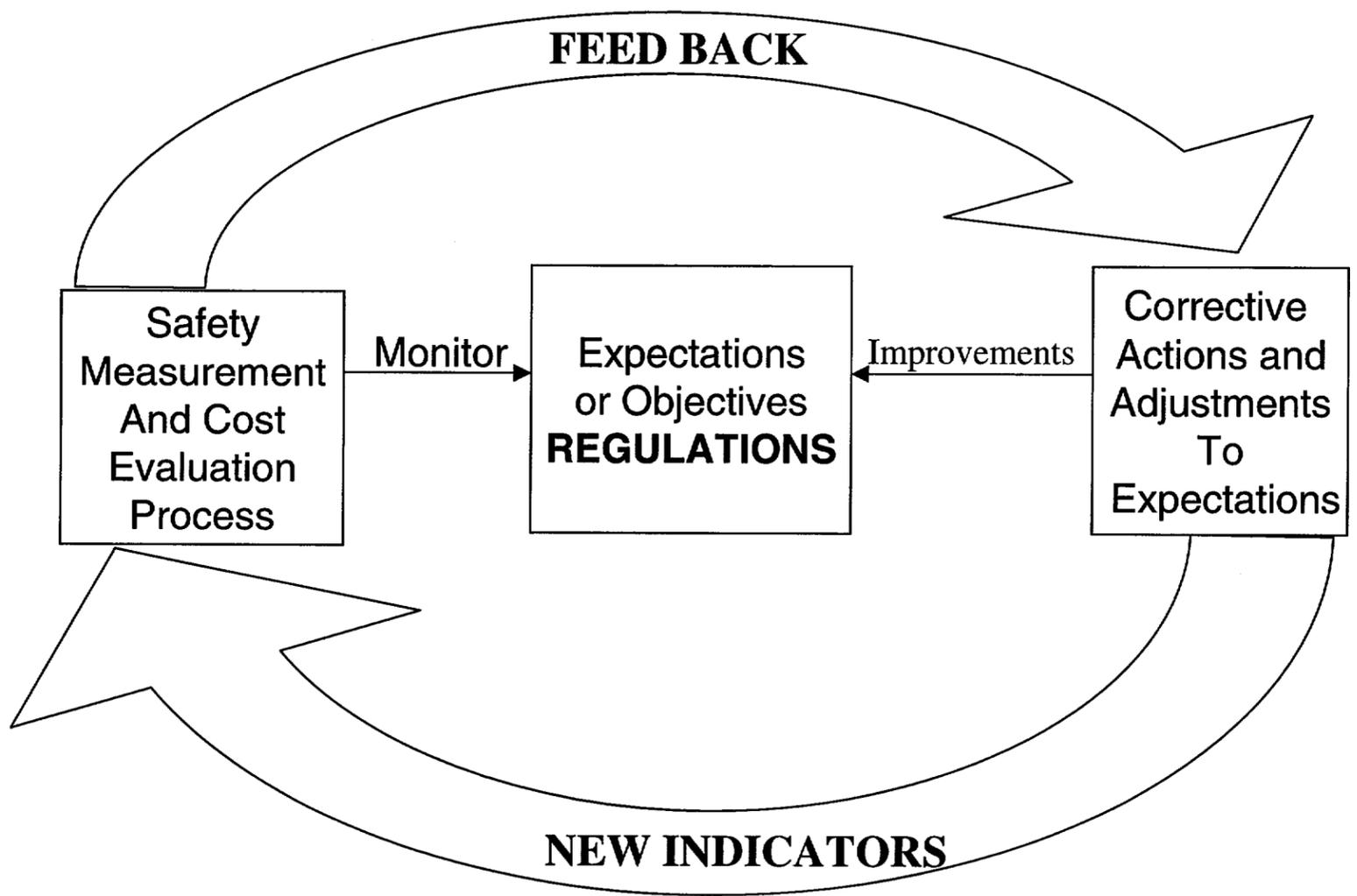
# Potential Applications

- Regulations
  - Regulatory Analysis Guidelines
  - Review Standards
- Licensing Actions
- Technical Specifications
- Reactor Oversight
  - Inspection
  - Enforcement
  - Performance

# Next Steps

- Communicate the staff's intent to the Commission, June 2002
- Public meeting with stakeholders in May
- Additional meetings/workshop
  - Follow ROP developments process

# Outcome Driven Process



# Rulemaking Application

Rule	Transients	Accidents	Fuel	Reactor Coolant Pressure Boundary	Mitigating Equipment And Operator Reliability	LERF	Large Late Release	EP
50.xx.a	X							
50.xx.b		X	X		X			
50.xx.c								X
50.yy.a				X				
50.yy.b			X					
50.yy.c						X	X	
GDC A	X	X	X	X	X	X	X	
GDC B		X	X					