

BSEE 2015 Domestic & International Stds

Workshop

Quality Management / Equipment Reliability

**Equipment Design and Reliability
from Design to Decommissioning**

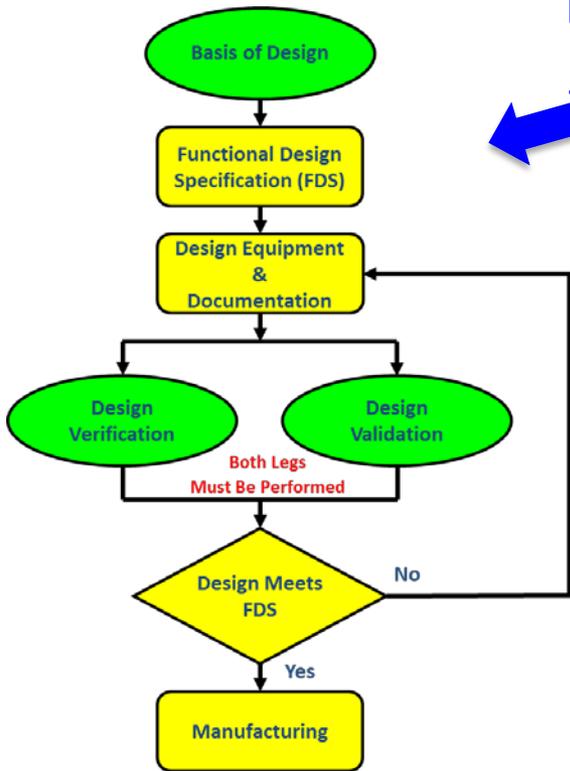
Jim Raney

Anadarko Petroleum

Equipment Design and Reliability from Design to Decommissioning

- Design Reliable Equipment
- Operational Environment
 - Culture of Safety
 - Human Factors Program
- Design for Operational, Extreme and Survival Loads
- Risks Analysis, Assessment and Management

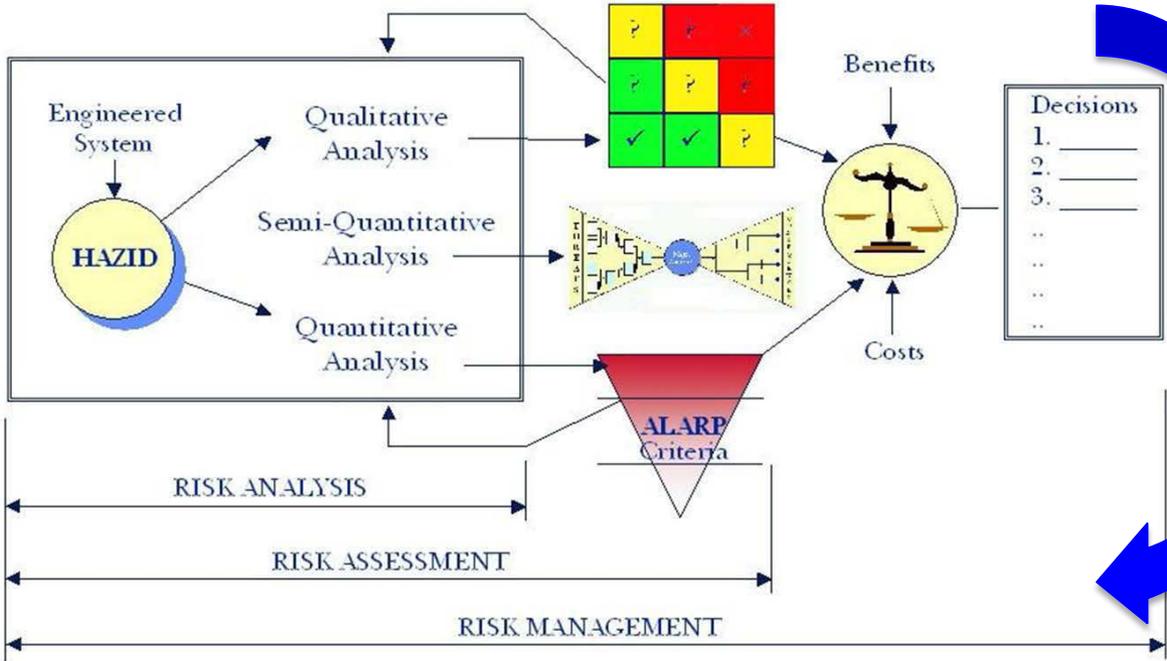
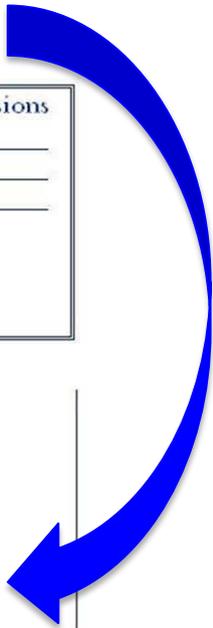
Designing For Reliability



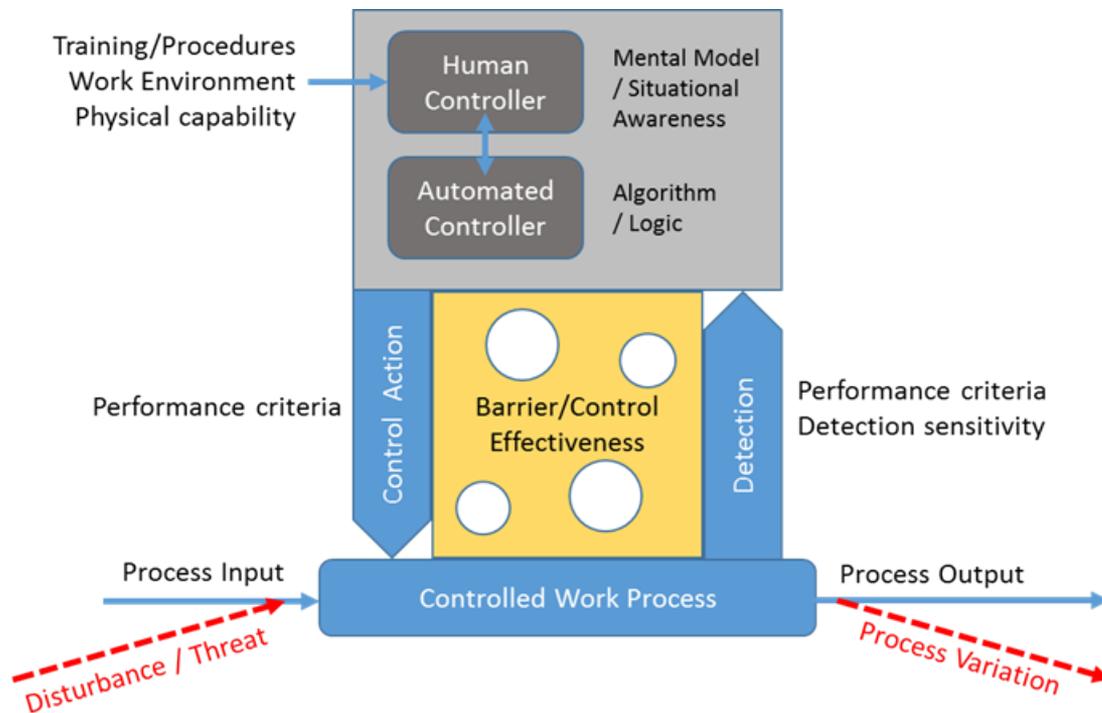
Everything starts with the design.....



.....and finishes with a Risk Management

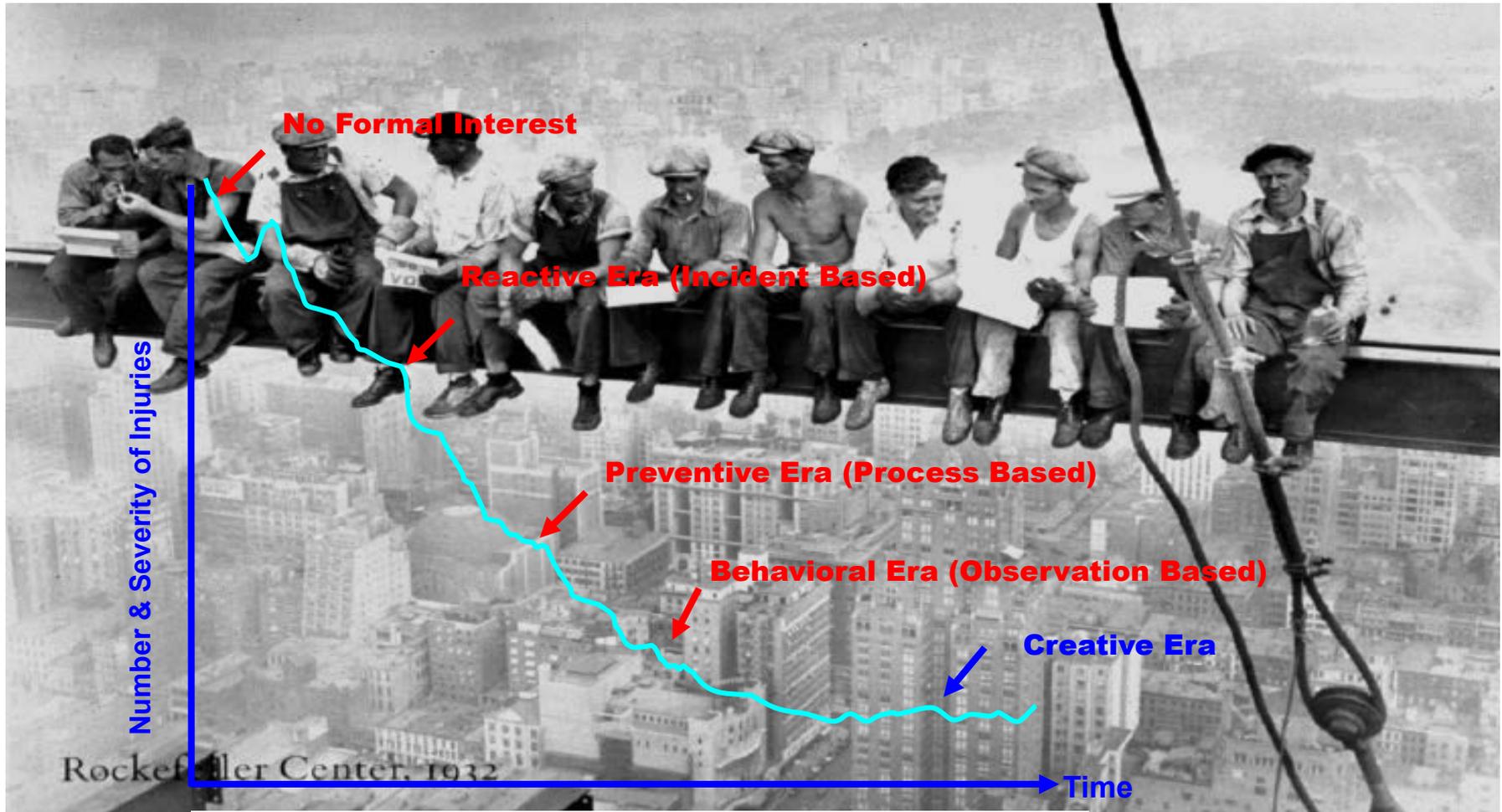


Designing For Reliability

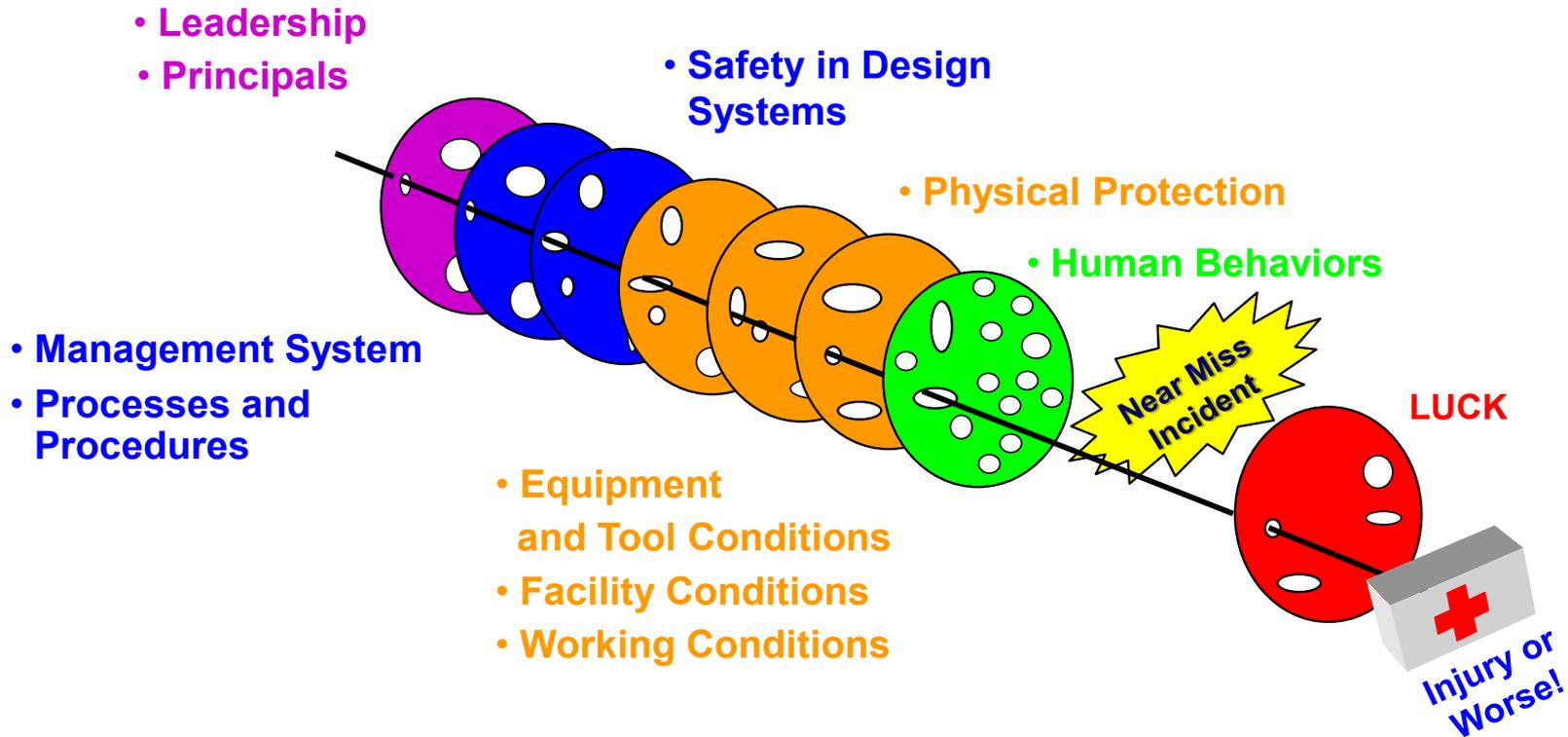


“If I am an engineer, I better damn well understand what reliability and what failure means, otherwise I am not an engineer...”, Maxime Faget

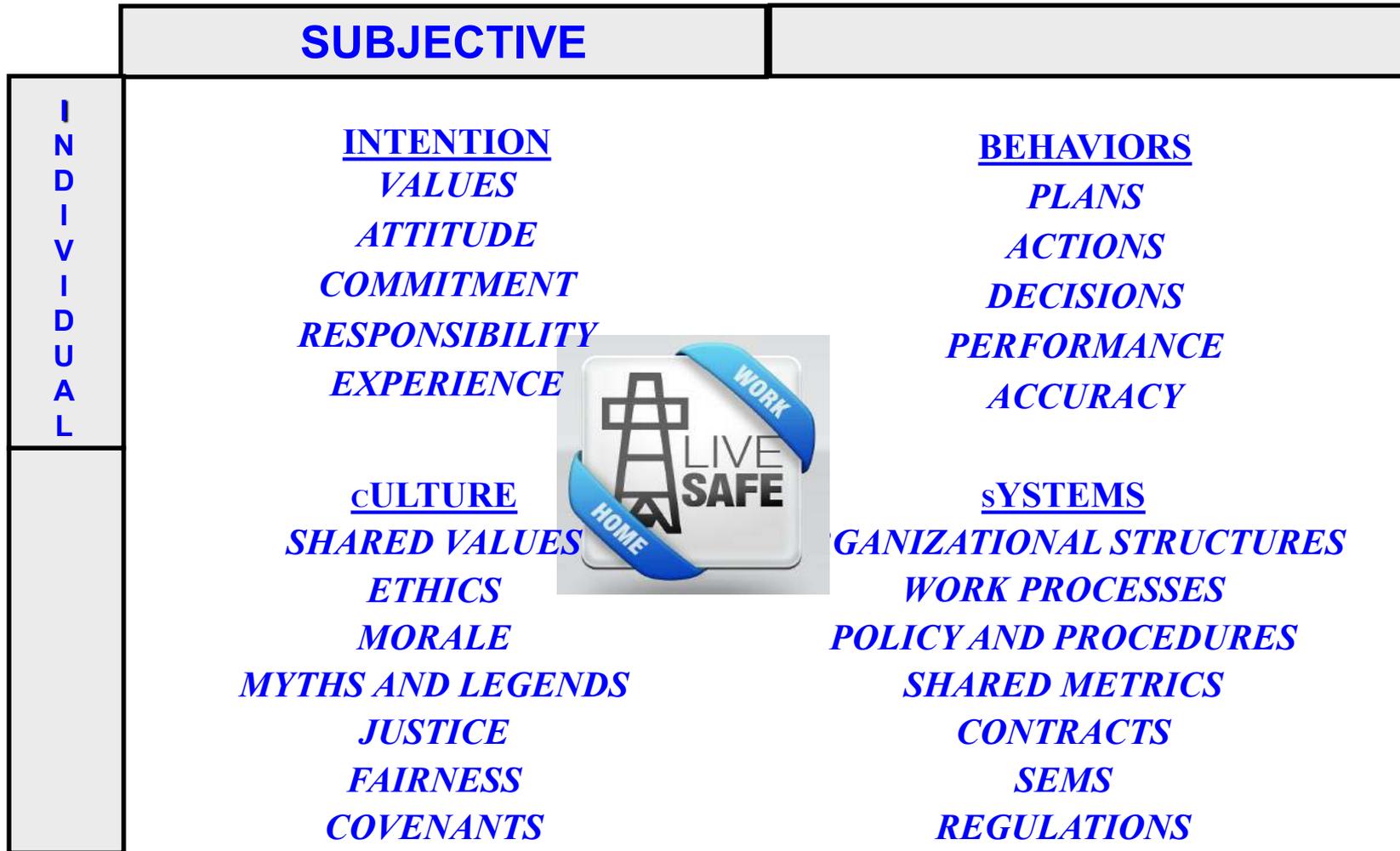
The History of Safety



Incident Prevention Filters



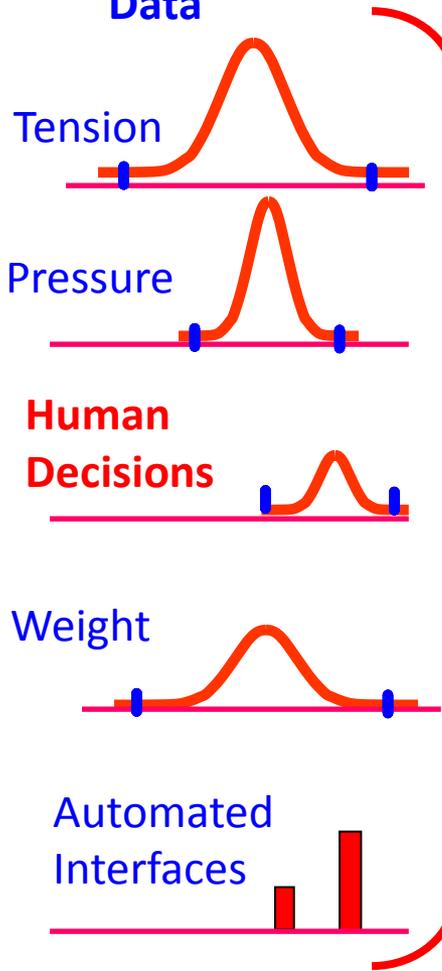
The Integral Model of Safety



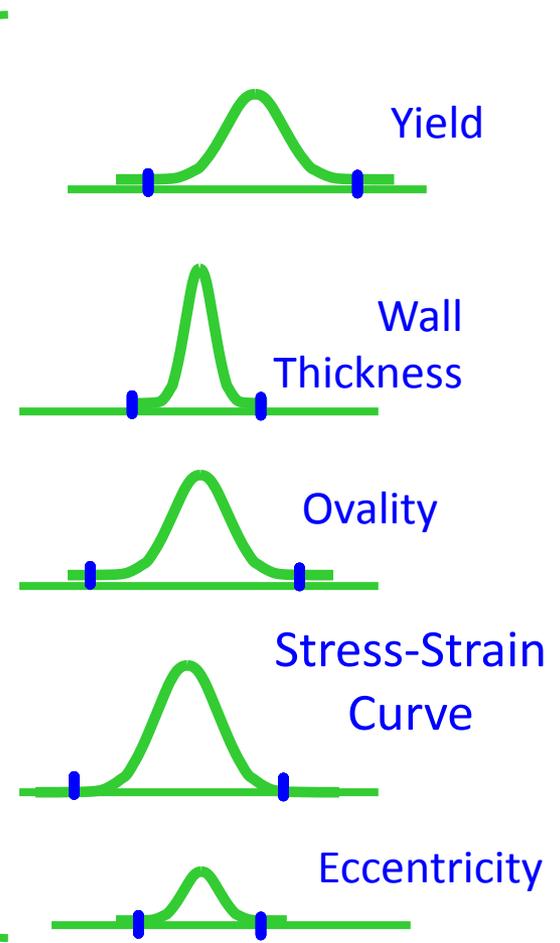
Design Concept

Reliability Based Design Theory

Load Historical Data

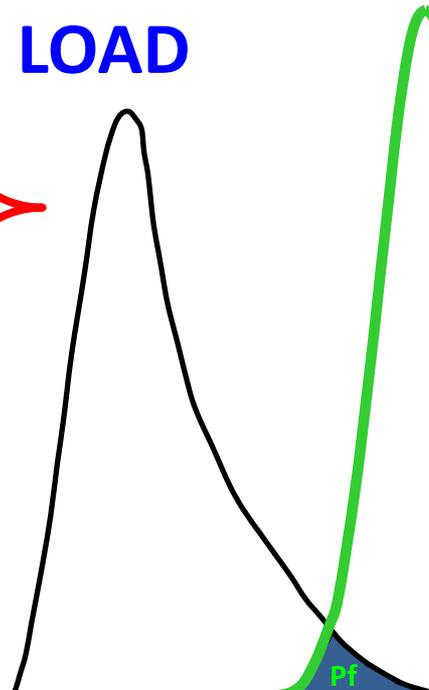


Equipment Performance Data

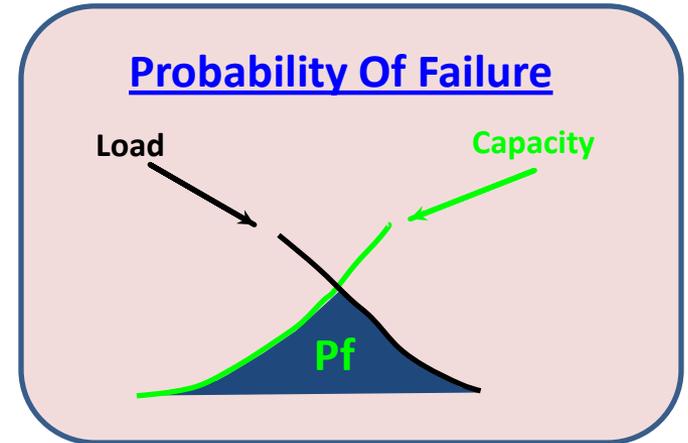
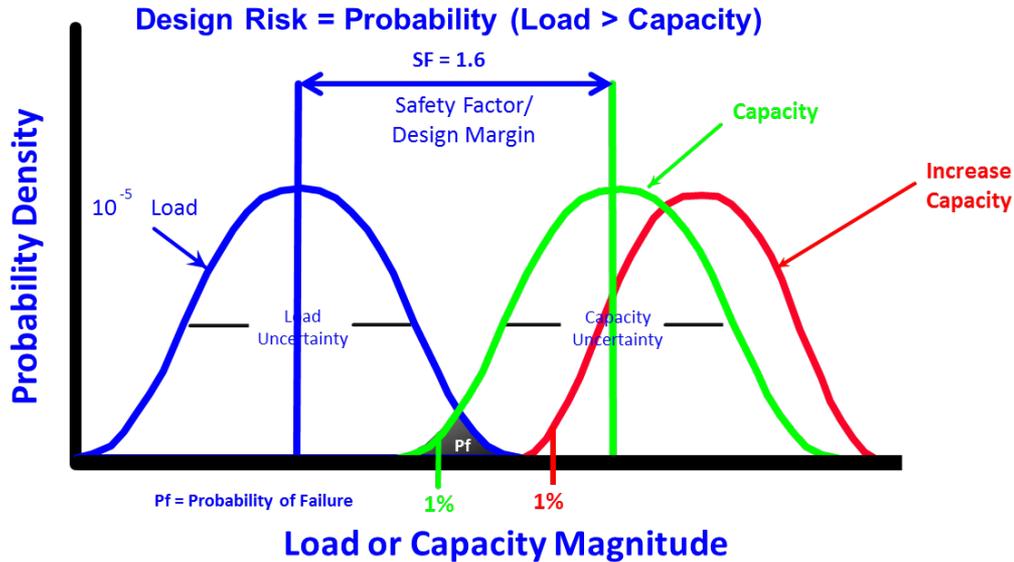


RESISTANCE

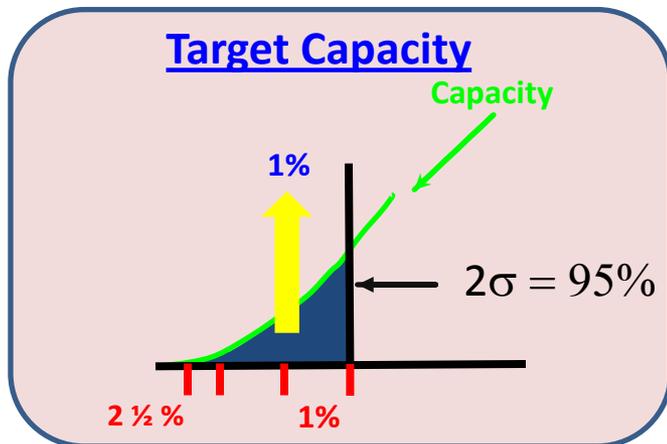
LOAD



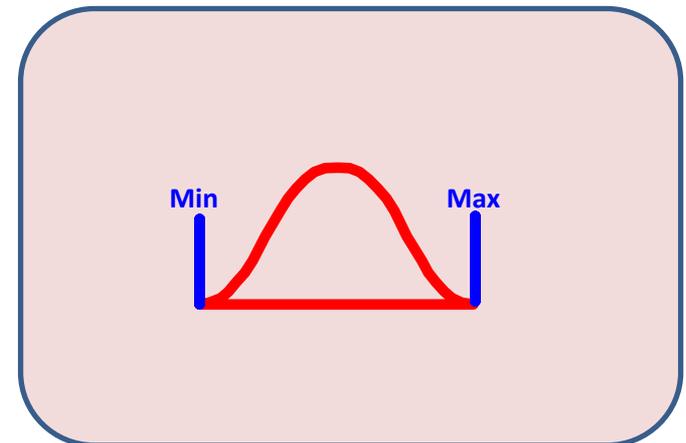
Reliability Based Design



Pf = the area when the load exceeds the capacity



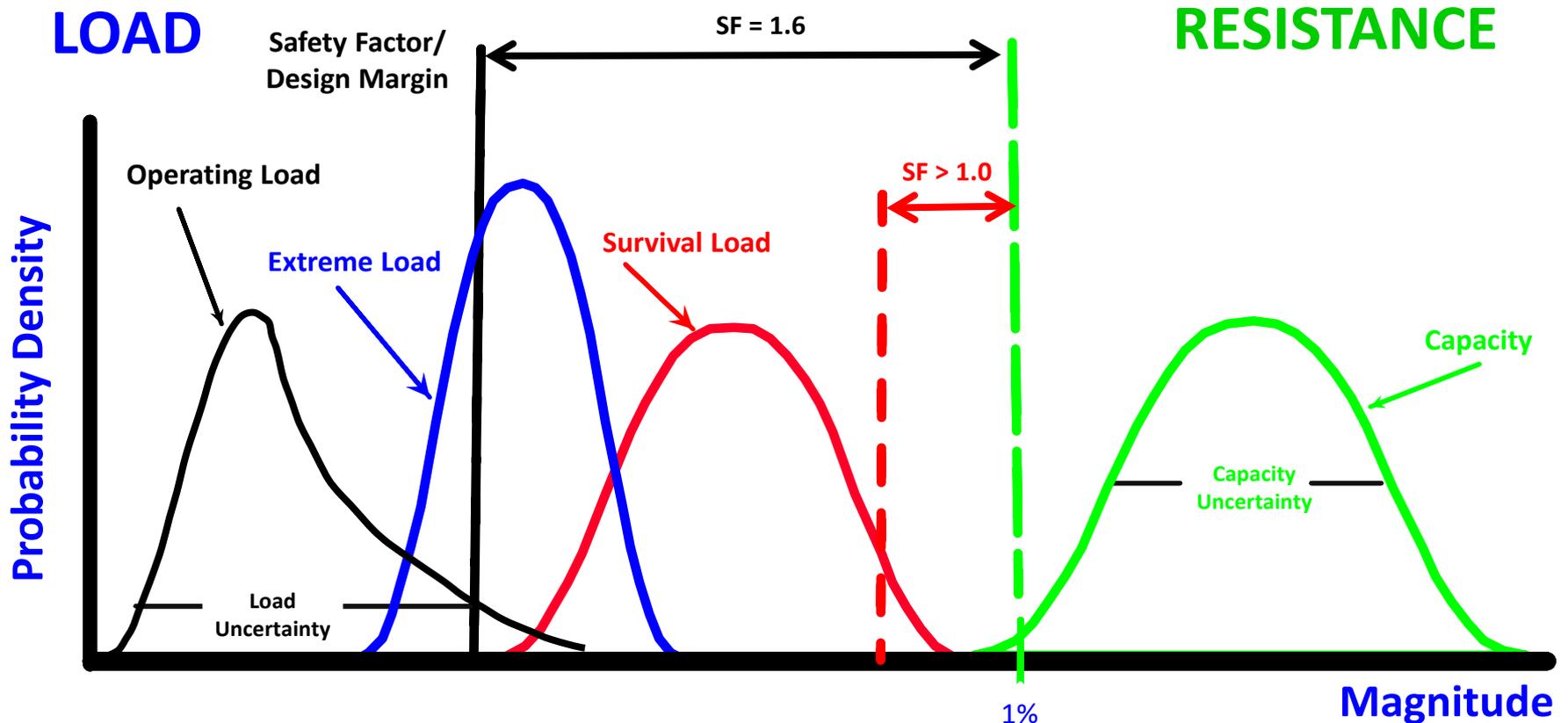
Target Capacity = weighted Value of the bottom 2 1/2%



Multi – Variables Using Truncated Normal

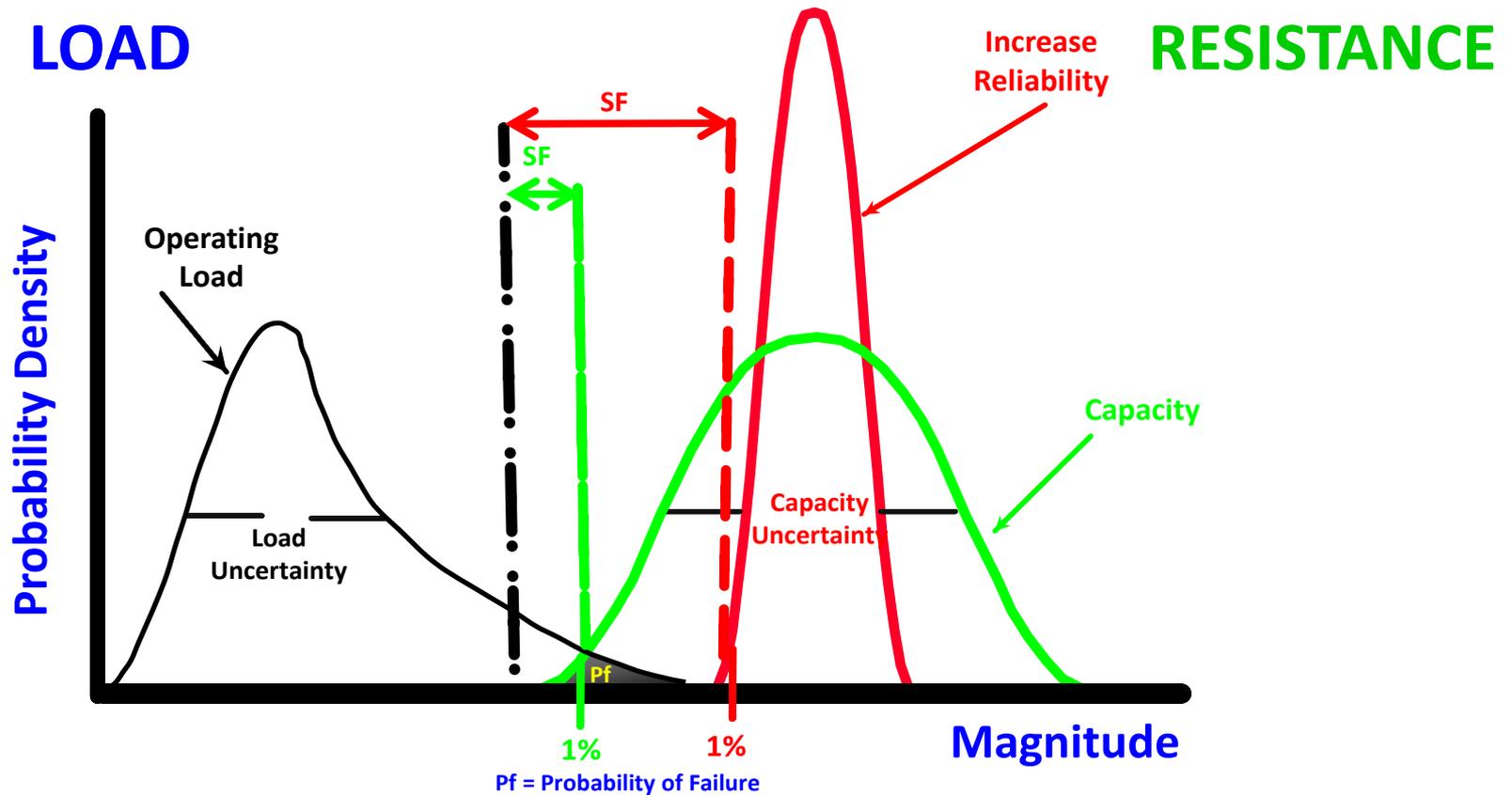
Design Concept – Load Variability

Design Risk = Probability (Load > Capacity)



Design Concept- Reliability

Design Risk = Probability (Load > Capacity)

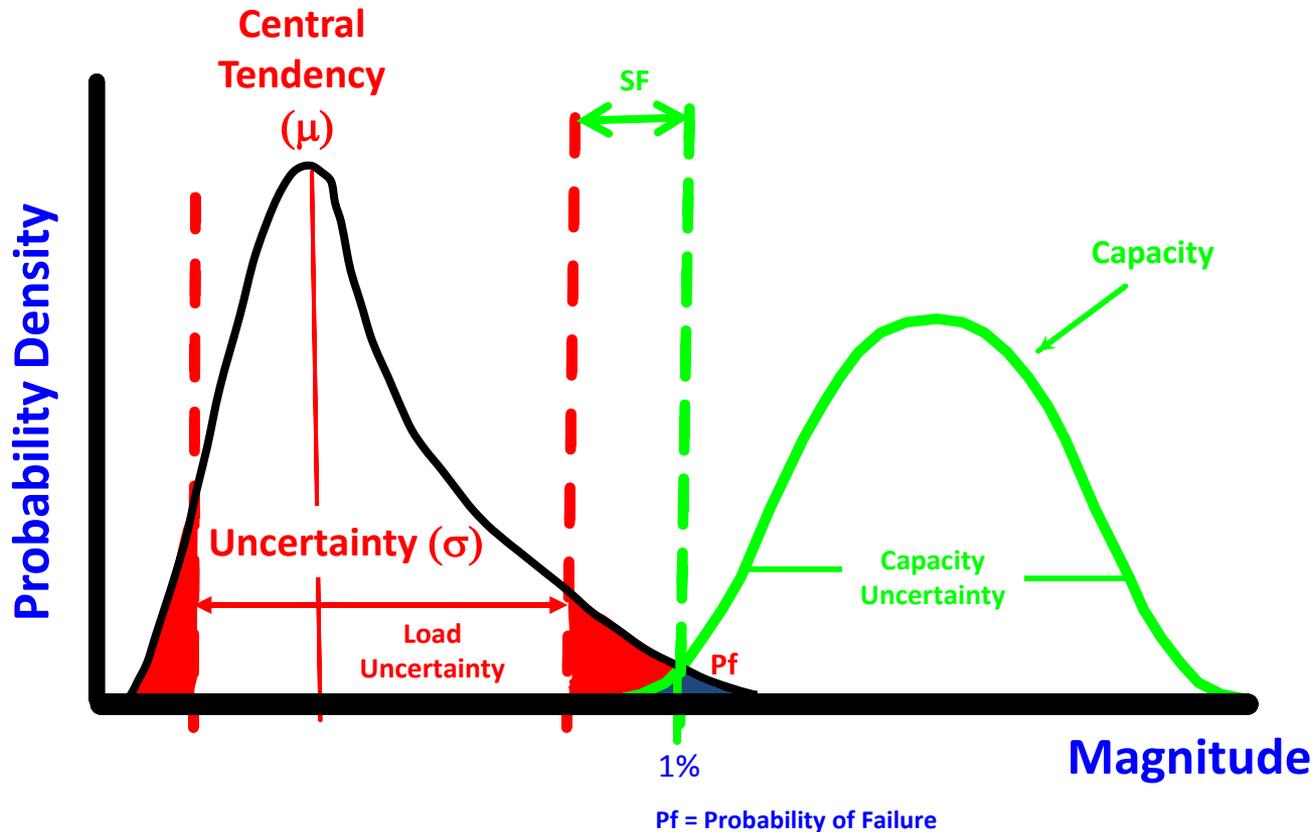


Design Concept - Human Factor

Design Risk = Probability (Load > Capacity)

LOAD

RESISTANCE

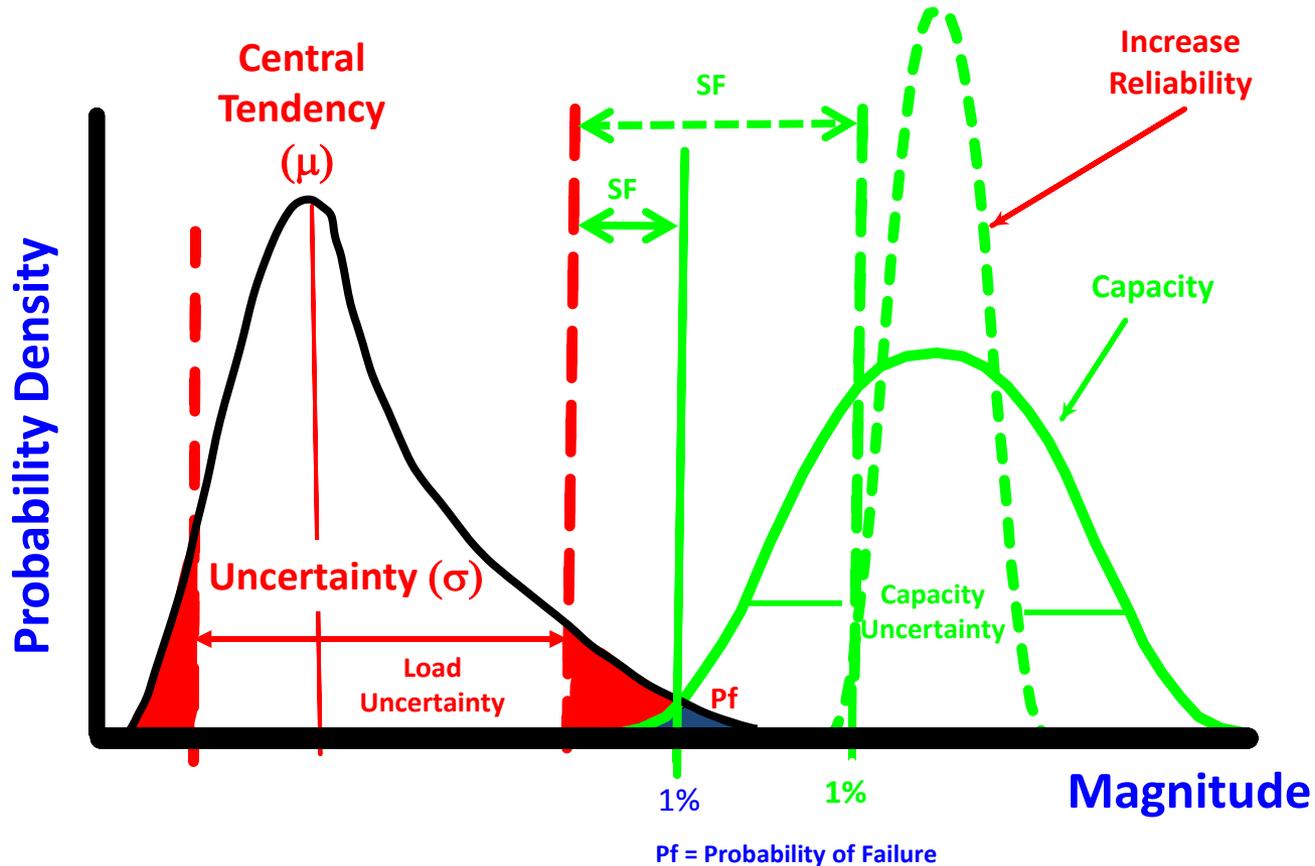


Design Concept - Human Factor & Reliability

Design Risk = Probability (Load > Capacity)

LOAD

RESISTANCE



Risks Analysis, Assessment & Management

Risk models have different levels of detail – but most work in a similar manner

