



How Can We Be Certain About Risk?

Jim Little

The Nuclear New Build Example

■ Projects

- Large Multi Billion Dollar Investments
- Exposure Over Multiple Years
- Complicated Environments
 - Economically
 - Politically
- Many Interfaces and Influences

- These are **BIG Decisions** and **BIG Challenges**



So, What Can We Do About Risk?

Industry Lessons of the Past

- Many Unique One-of-a Kind Designs
- Fast Track Projects
- Stick Built Construction
- Split Responsibilities
 - Owner
 - NSSS Vendors, OEMs
 - AE
- Moving Regulations & Backfits
- Economic Instability
- Uncertain Government Policy

- So How Have We Addressed These?
 - As Problems or Risks?
 - Is there a Difference?



Management Approaches Haven't Changed

■ Project Management

- Relies on expertise of people
- Good Plans – lots of detail
- Well Thought Out & Tested Procedures
- Designed to Produce Predictable Results

■ Risk Management

- Identifies Threats to Progress
- Proposes Mitigation to Threats

Has the Game Changed?



Can You Afford to Play?

The Traditional View of Risk

- **Risks are Events That Threaten Success**
- **Many Possible Kinds of Threats**
 - Labor, Productivity
 - Supply chain
 - Regulatory Delay or Change
 - Escalation
- **For Every Threat There Must Be Prevention & Mitigation**
 - Conquer
 - Accept



Hammer & Nail Risk Management

■ Identification – The Nail

- Lessons Learned on Projects
- Brain Storming
- The More Items – the better

■ Impact & Mitigation – The Hammer

- Identify Likelihood, Impact and Mitigation Costs
- Valuable in identifying Solutions

■ There is Risk in Deterministic Risk Approaches!

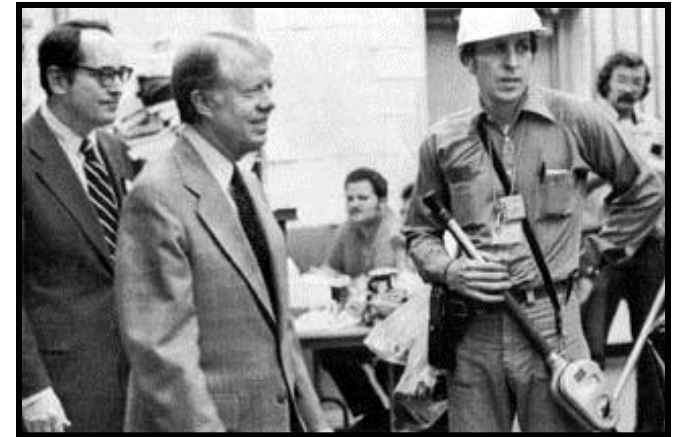
- Do Not Include Dependencies
- Do Not Consider Dependencies with Other Conditions or Combinations of Lower Consequence, Higher Probability Events



Remember The Real Lessons of TMI?

■ **Before TMI**

- Nuclear Safety Was Treated Deterministically
- Design Basis Events
 - Small & Frequent - No Damage Allowed
 - Large & Rare - No Public Threat
 - Safety Was Extrapolated



■ **After TMI**

- Probabilistic Risk Assessment Showed:
- Interdependencies are Important
- Sensitivity Studies of Assumptions are Vital to Understand Real Risk

We Know What Risk FEELS Like



BUT,
We Only Know **After** It Happens...

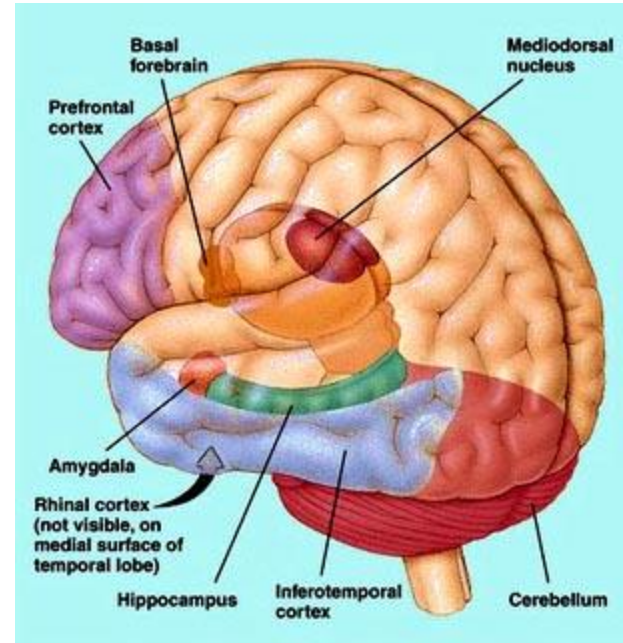
Your Brain At Work – David Rock

■ Primary Function

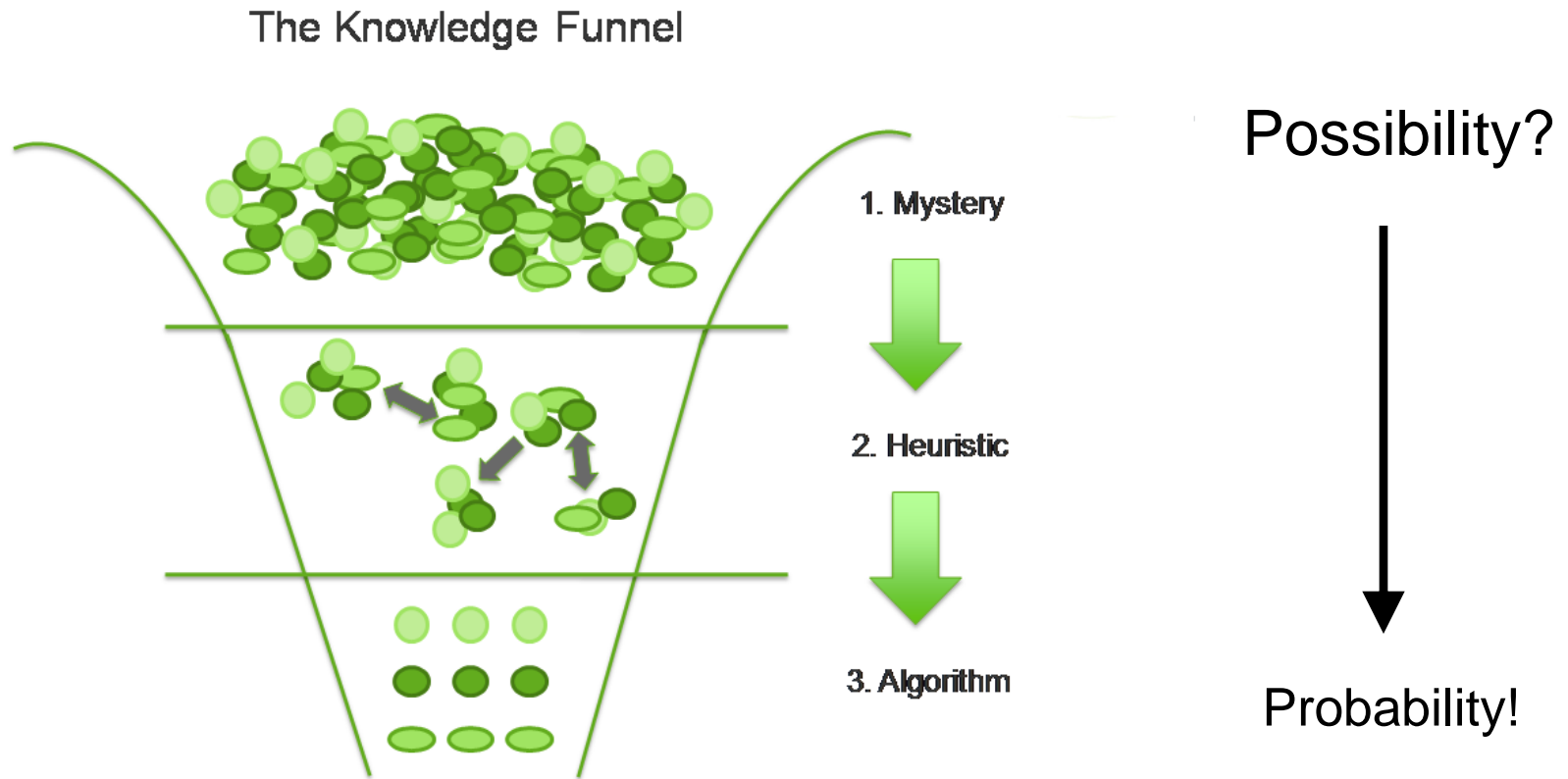
- Keep You Functioning
- Keep You Safe
- Solve Problems
- Learning & Memory

■ We Are “Pre-Wired”

- Rely on Learned Experiences
- Away – Toward - Conditioned Response
 - 4 Times More Likely to Move Away from New Encounters



We Are Driven to Reliability & Efficiency



Source: *The Design of Business*, Roger Martin, 2009

What Risk Looks Like....



Risk Assessment

- **Requires Insights**

- Probability
- Consequences
- Treatment of Assumptions as well as Events

- **What We Assume is Important**

- Fill in the blank:
 - “We ALWAYS do that”
 - “We BELIEVE that....”
 - “We ASSUME that...”
 - “We TRUST that.....”
 - “We HOPE that.....”
 - “We PRAY that.....”

Risk Assessment

- **Requires a Different Perspective**
 - Counterintuitive to Getting Results
 - You are looking for failures – Anti Solutions
 - Obtuse - Not Straightforward
 - Combinations of complex conditions, sequences
 - More Like a Mystery than a Puzzle

What *is* the Difference Between a Mystery and a Puzzle?

A Puzzle is Missing Pieces.

A Mystery Has Too Many.

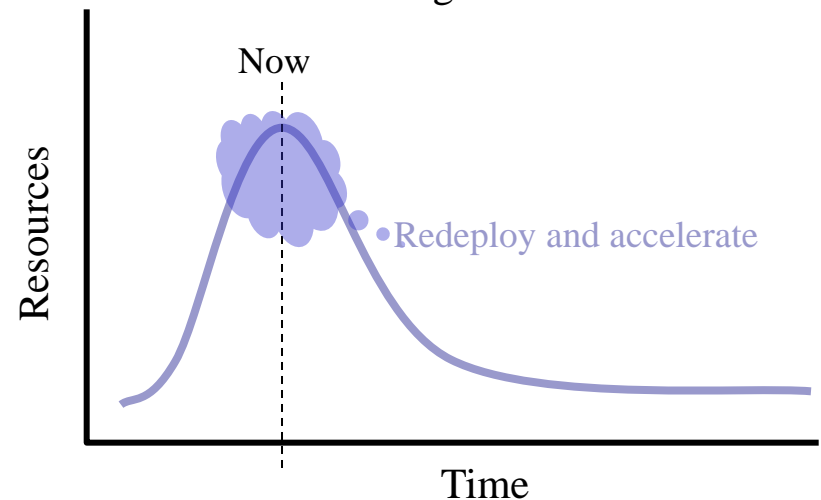
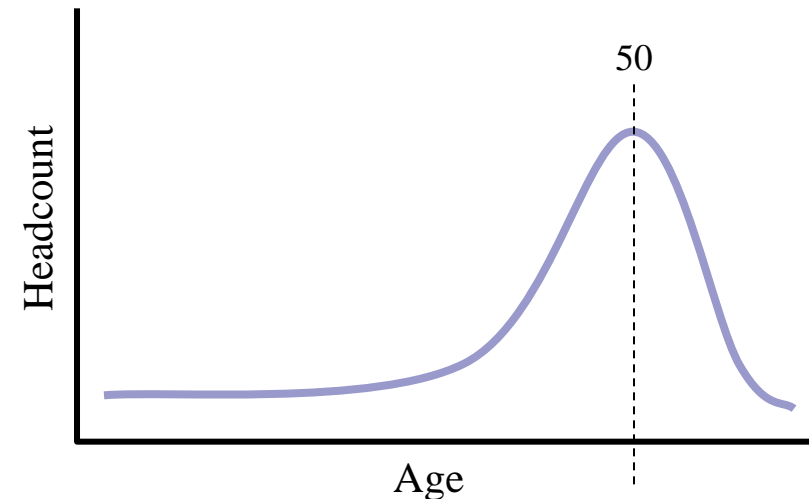
Mindset Example: Aging Workforce

■ View Uncertainty as **Threat**

- Hire/steal more talent
- War on Talent
- Critical knowledge will be lost
- Lack of new talent entrants

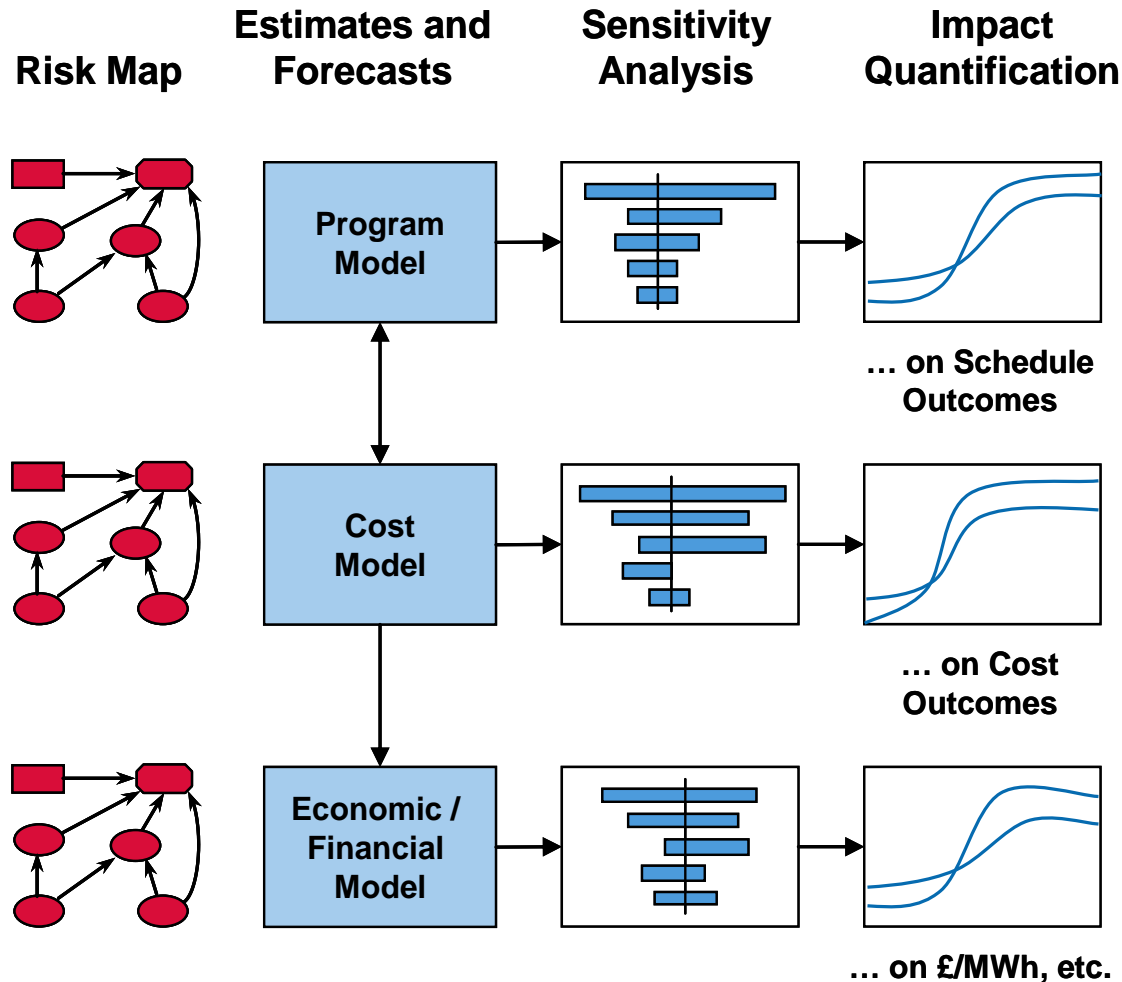
■ View Uncertainty as **Opportunity**

- We have resources now
- Accelerate Talent Growth



PRA Modeling of Projects

Analytic Structure of Project Evaluation



Taking the Fear Out of Risk

■ Change the Mindset

- **RISK** Promotes **REACTION**
- Use the Word “**Certainty**” Not **Risk**
- **Certainty** has **Upsides** as well as **Downsides**

■ Focus on the **ASSUMPTIONS** Not **DATA**

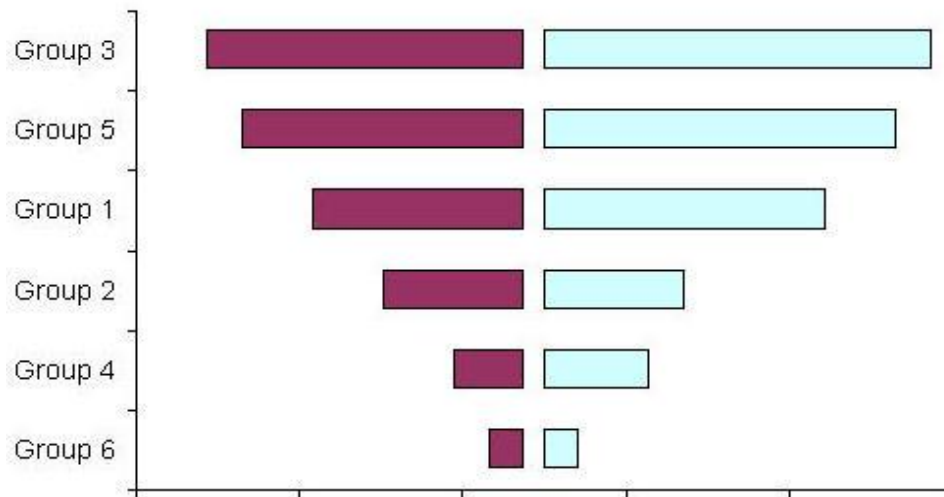
- Do We Know What They Are?
- Are We Making Assumptions About Assumptions?
- Could They Have Ranges Instead of Values?
 - Schedule
 - Cost
 - Likelihood?

■ *Play With the Results*

- How Sensitive are the Results to Changes in Assumptions?
- Could Uncertainty Be Turned into an Opportunity?

Understanding the Shape of Certainty

■ Ranked by Contribution to Uncertainty



■ We Can Make Informed Decisions

- Know What is Most Important
- Know What is Most Effective
- Know the Costs Required

Delivering Certainty

- **Balance Our Plans with Insights**
- **Change Our Mindset**
 - Think Outside of Our Experience
 - Use Facilitated Approaches to Avoid Logic Traps and Biases
- **Use Questions More Than Answers**
 - From.....
 - “If and Then...”
 - To.....
 - “What If? And “How Might We?”
- **Model The Logic of Our Plans & Possibilities**
- **Be Intellectually Curious About the Shape of Certainty**



Key Question

Can You *Risk* Being Uncertain
About *Risk* ?

Probably Not!