

# Keys to Effective Site-Wide Risk Management and Efficient Resource Utilization

**APCChE PSM Seminar**

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# Outline

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- **Establish a strong foundation....your safety culture**
- **Use good engineering standards...design it well and build it well**
- **Operate using an Operations Integrity Management System...operate and maintain it well**
- **Discover, assess and manage risk...look for risk, find it and manage it well**
- **Employ the right tools...a typical risk matrix may not suffice**
- **Consider the benefits of an IsoRisk Matrix...efficient resource utilization**



# Establish A Strong Foundation

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- **Leadership**

- **Believes that “good enough rarely is”**
- **Clearly establishes expectations and goals**
- **“Walks the talk” ....a visible and tangible commitment to manage risk and prevent incidents**

- **Workforce**

- **Reinforced by regular communications and actions that send the message that safety is job 1!**
- **Engaged and listened to**
- **Genuinely believes that flawless performance is achievable**



# Use Good Engineering Standards

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- **Comprehensive**
  - **Covers both Design and Construction**
  - **Incorporates Good Engineering Practices (GEP)**
- **Maintained and Improved**
  - **Continually reviewed and updated based upon company and industry learnings**
  - **Regular guidance issued to sites to ensure effective management of change**

# Operate using an Operations Integrity Management System

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- **Overarching**
  - Applies to all personnel and activities
  - Establishes the fundamental operating framework
- **Comprehensive**
  - Addresses all SHE Management elements
  - Provides sufficient detail to guide consistent and effective site action
- **Accountable**
  - Periodically audited by line managers and experts “above the site”
  - A factor in everyone’s performance appraisal

# Discover, Assess and Manage Risk

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- **Broad and deep risk discovery**
  - Employs different hazard analysis techniques
  - Establishes a fundamental mindset that more risk discovery is a good thing...not a bad thing
- **Assessing and Prioritizing**
  - Experienced teams evaluate all discovered risks as consistently as possible
  - Clearly delineates priorities for follow-up action
- **Decision-Making**
  - Applying available resources efficiently
  - Goal: Each incremental resource investment generates the most risk reduction possible

# Employ the Right Tools

## A Typical Risk Matrix May Not Suffice



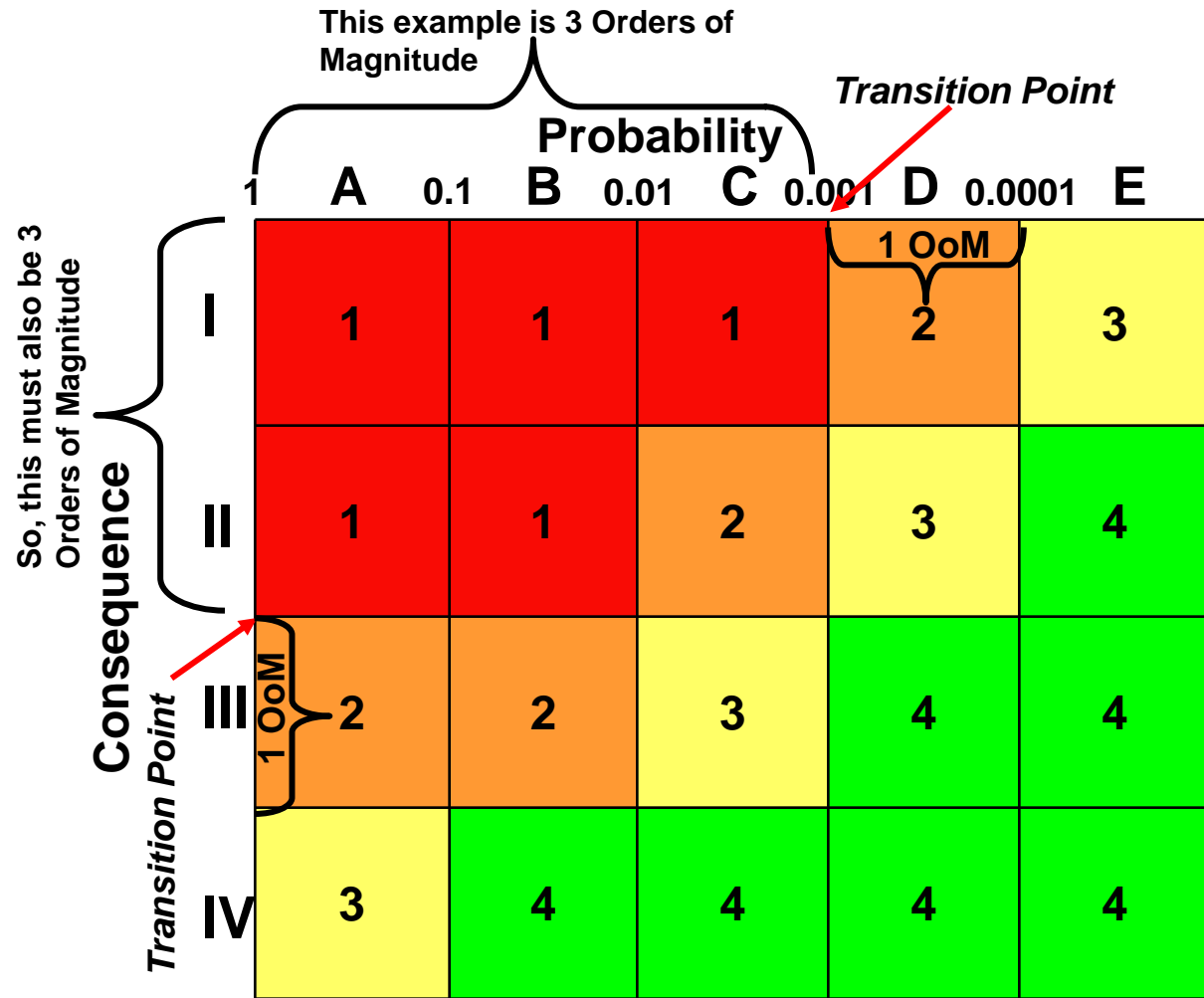
		Probability				
		A	B	C	D	E
Consequence	I	1	1	1	2	3
	II	1	1	2	3	4
	III	2	2	3	4	4
	IV	3	4	4	4	4

*4x5 Risk Matrix  
With 4 Categories of Risk*

- **Widely used**
- **Prioritizes risk into categories (H, M, L, or 1-4, etc.)**
- **Greater resolution often needed to make best risk management decisions**
- **An IsoRisk matrix is often helpful**

# Constructing The IsoRisk Matrix

## Transition Points Offer Key Insight

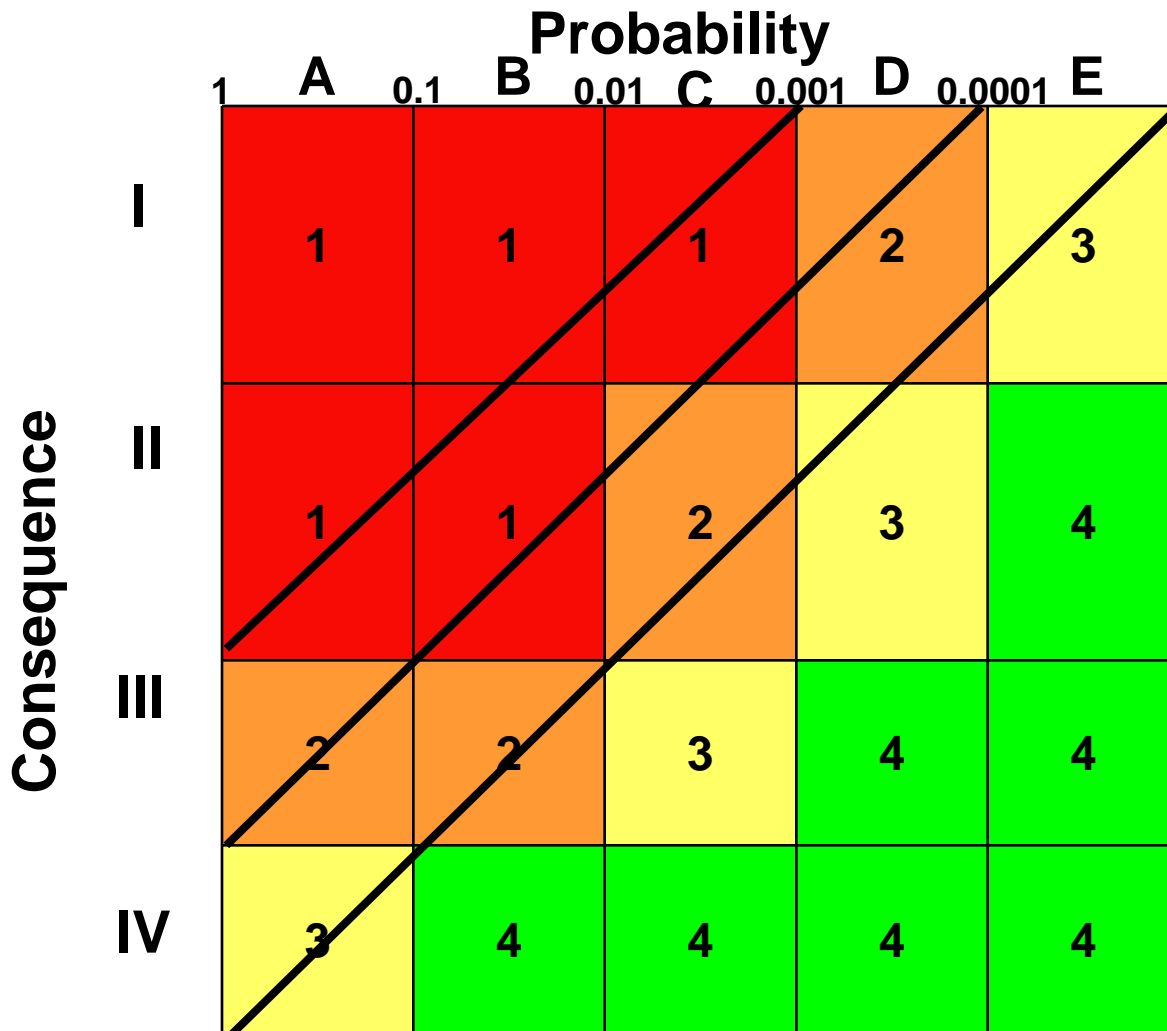


- Transitions are key
- Probability scale can be described numerically
- Equivalent risk at transitions allows Consequence scale to be described numerically



# Constructing The IsoRisk Matrix

## Drawing The IsoRisk Lines



- Points of known equivalent risk are connected
- This determines the IsoRisk slope
- Other parallel IsoRisk contours can then be added

# Constructing The IsoRisk Matrix Assigning Risk Units

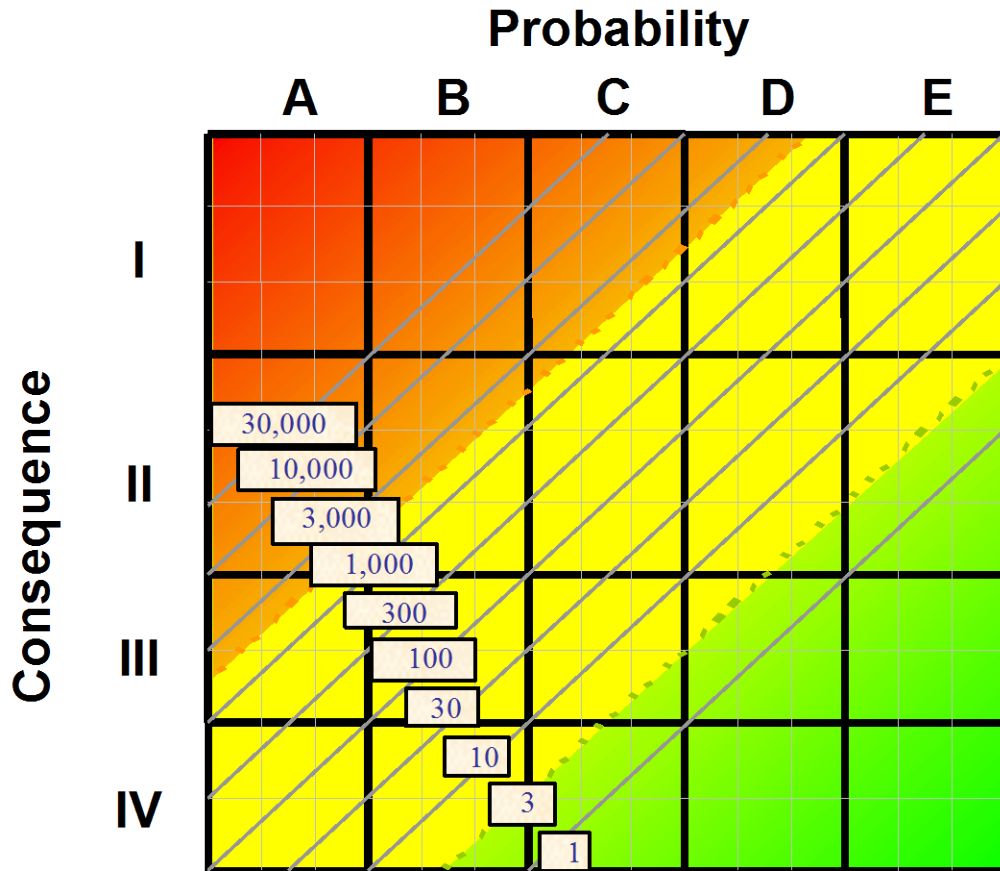
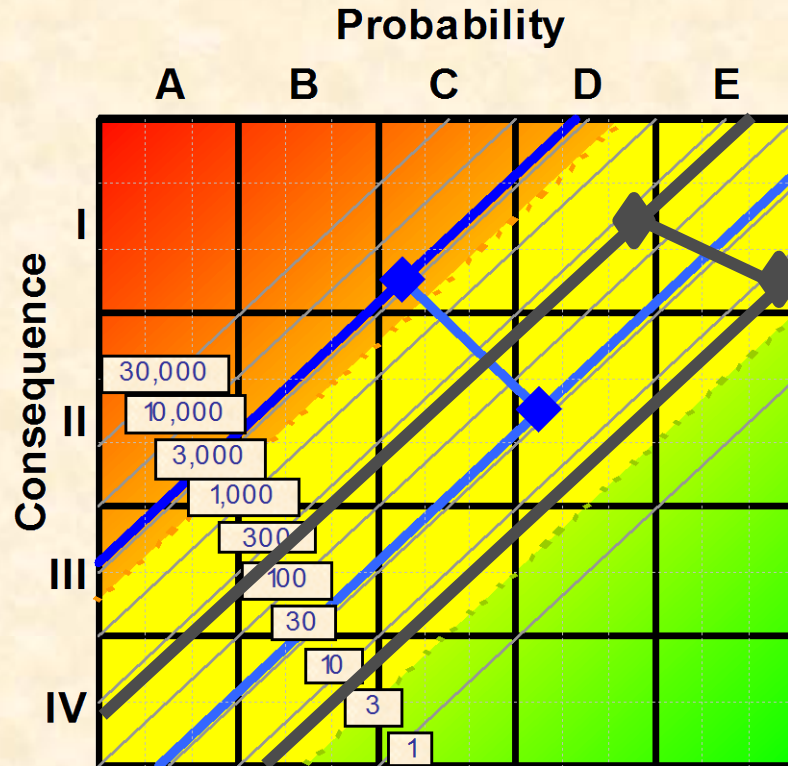


Figure 3: IsoRisk Matrix With Risk Unit Contours

- Assign any IsoRisk contour a value of 1 Risk Unit
- The risk significance of all other contours can be described relative to this contour



# Applying The IsoRisk Matrix



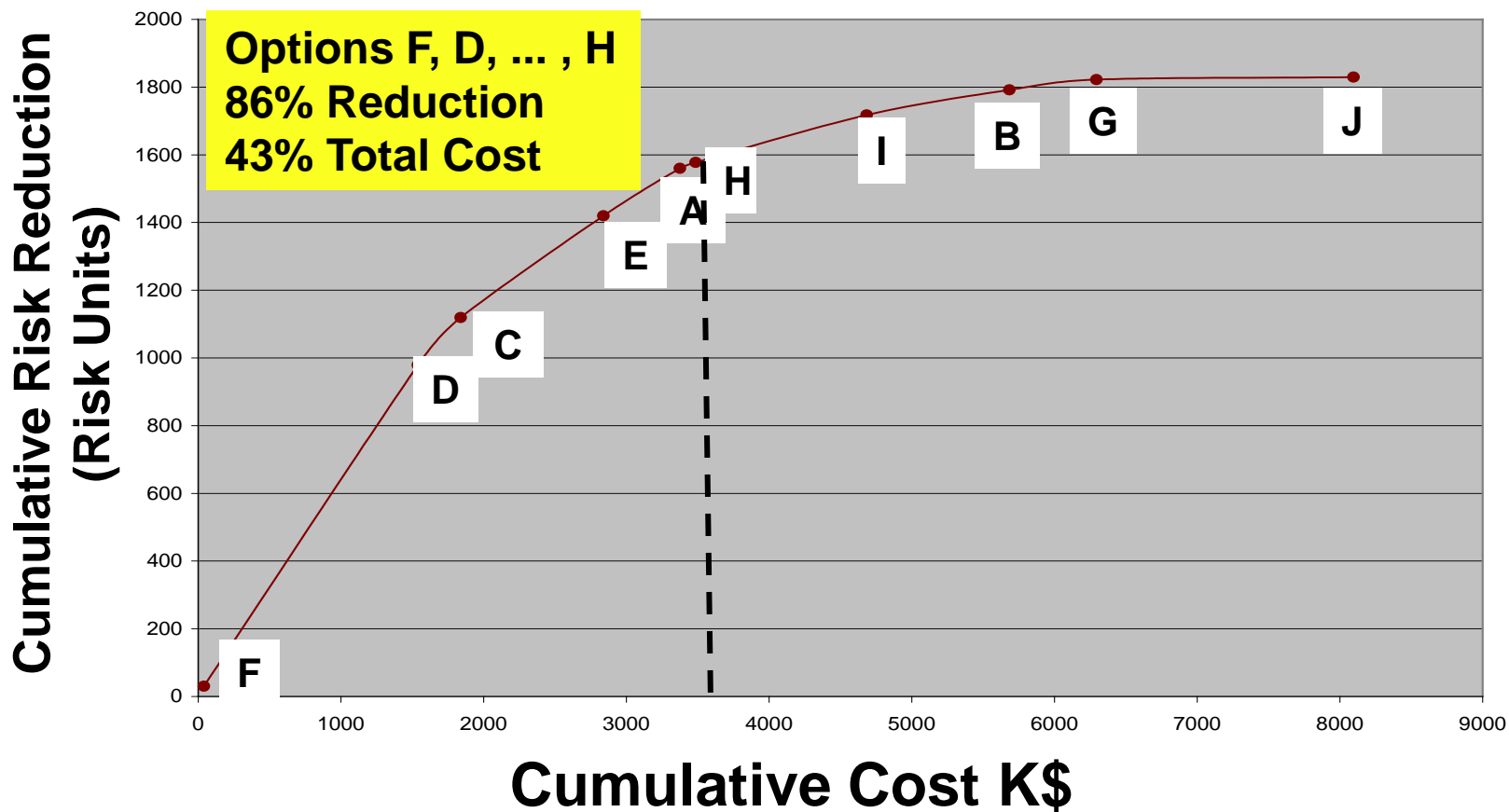
- Reducing a risk from one matrix position to another results in measurable “benefit”
- Benefit/Cost analysis can be used to compare the options

	"As-Is" Risk	"As-Is" Risk Significance	"After" Risk	"After" Risk Significance	Risk Reduction (Benefit)	Cost \$	B/C Ratio per \$1,000
Option A	IC	3,828	IID	38	3,790	\$800,000	4.7
Option B	ID	261	IE	8	253	\$50,000	5.1

# Applying The IsoRisk Matrix To Rank Risk Reduction Options



## Cumulative Benefit To Cost



# Key Elements of a Structured Risk Management Process



## Discover



"I can only manage that which I know"

Identify Hazards  
Broad and deep discovery processes

Identification of hazards that pose risk

**Hazards**

"What Hazards could pose risk to my business?"

## Assess

**Risk Matrix**  
Probability

	A	B	C	D	E
I	1	1	1	2	3
II	1	1	2	3	4
III	2	2	3	4	4
IV	3	4	4	4	4

Consequence

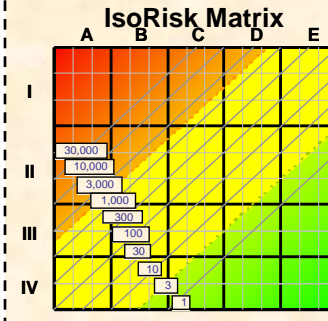
Assess Risks  
Assess and prioritize risks

Assessment of Risks

**Risks**

"What are the risks, and how significant are they?"

## Manage

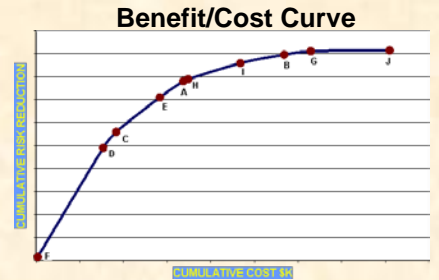


Evaluate Options  
Develop and evaluate risk-reducing alternatives

Evaluation of options

**Options**

"What can I do about it, and how much risk reduction?"



Make Decisions and Execute  
Decide what to do, in what order, and at what rate and pace

Allocation of resources

**Best decisions**

"Which things should I do, and in what order?"

Continually enhance and improve process



## Concluding Remarks

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- **Effective site-wide risk management requires many elements working together**
  - A strong foundation....your safety culture
  - Good engineering standards...design it well and build it well
  - An Operations Integrity Management System...operate it well
  - A good risk management process...look for risk, find it and manage it well
- **It also requires efficient resource utilization to maximize risk reduction**
- **Does your company have all the elements, and are your resources being allocated efficiently?**