



Saint Mary's
University

Halifax, Nova Scotia, Canada



CNCOHS
CN CENTRE *for*
OCCUPATIONAL HEALTH & SAFETY
A Saint Mary's University Centre of Research Excellence

DEVELOPING AND VALIDATING SAFETY CULTURE METRICS

CN CENTRE *for*

Dr. Mark Fleming
Saint Mary's University

A Saint Mary's University Centre of Research Excellence

Outline

- **Importance of safety culture**
- **The need for Metrics**
- **Encana funded research**
- **Action research**
- **Progress to date**



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Piper Alpha



DEPARTMENT OF ENERGY

The Public Inquiry into the Piper Alpha Disaster

The Hon Lord Cullen



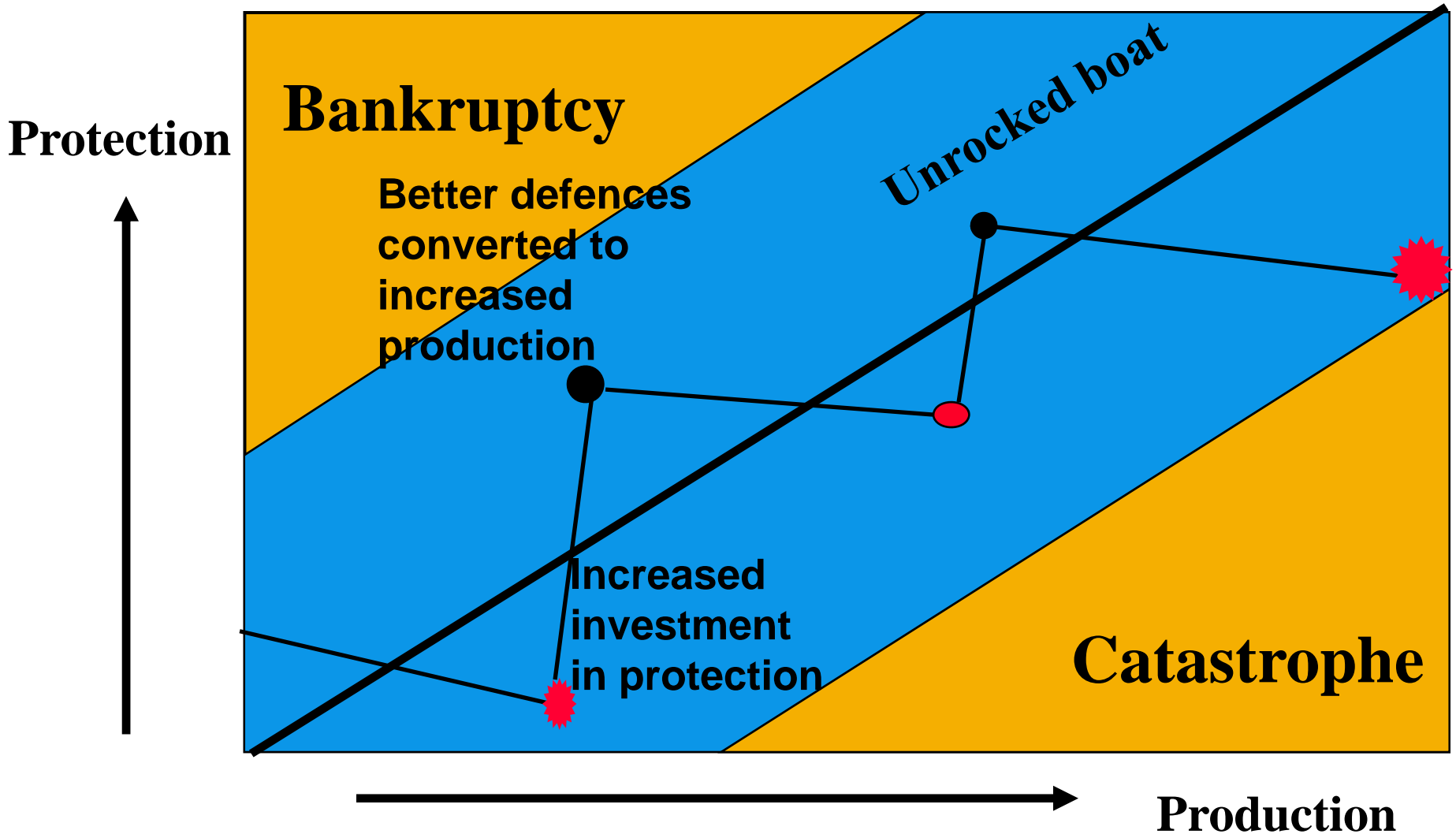
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Review of offshore disasters

- Reviewed 17 offshore disasters to identify cultural causal factors
- 14 disasters contained cultural causes
 - Tolerance of inadequate systems and resources (identified 10 times)
 - Normalization of deviance, (identified 9 times)
 - Complacency, (identified 8 times)
 - Work pressure/ cost (identified 4 times)

The safety journey



From Reason 1997

Steering a safe course

Navigation

- **Continuously updating current location**
- **Always know direction and speed**
- **Focus on anticipating future position and hazards**
- **Quick reaction times**
- **Accurate data**

Safety culture

- **Intermittent information on safety performance**
- **Uncertain if moving in the right direction**
- **Majority of indicators are retrospective**
- **Slow response times**
- **Weak predictive validity of indicators**



Research objectives

- **Establish current level of knowledge about safety culture, interventions to promote a positive culture and safety culture metrics**
- **Develop and test a number of safety culture metrics**
- **Produce a managers guide to safety culture assessment and improvement**
- **Evaluate the impact of the project on local managers' understanding of safety culture, use of safety culture metrics and use of safety culture improvement strategies.**



Steering group

- **Lonita Blinn**
 - **Clinton Cariou**
 - **Joel Carroll**
 - **Melissa English-Barbour**
 - **Jeff Hurley**
 - **Jeffery Penton**
 - **Stephen Sayle**
- McDermott**
ExxonMobil
Survival systems
Worley Parsons
Encana
Maersk
SBM



Good indicators

- **Accurate**
 - **Direct relationship with system status**
 - **Difficult to manipulate**
- **Predictive**
 - **Related to future system states and performance**
- **Current**
 - **Real time information**



Example: Employee safety reports

Employee safety reports	Score	%
Poor quality report and of little value. Little information provided, only a few words, describing a behaviour without interaction or an unsafe situation without follow-up or remediation (e.g. saw worker wearing all PPE).	1	
Medium quality report on a safe or unsafe behaviour, hazard, or unsafe condition. Provides good description including interaction with those involved or remedial action taken.	2	
Excellent report on a safety critical event, action or success. This information provides insight into the functioning of safety management. Provides good description of situation including nature of event, interaction with those involved and remedial action taken or communication of proactive action.	3	



Action research

- **Assess current knowledge about safety culture**
- **Identify gaps in knowledge**
- **Provide information to address gaps**
 - **Managers guide to safety culture**
 - **Online courses**
 - **Website (www.safety-culture.ca)**
- **Evaluate impact on knowledge and practice**

Progress and next steps

Progress

- Formed steering group
- Completed ethics
- Specified criteria for metrics
- Developed manager interview protocol
- Developed draft metrics

Ongoing work

- Develop more draft metrics
- Test metrics for usability, reliability and validity
- Assess current state of safety culture knowledge
- Develop and circulate safety culture education

