

# Day 2: External Expert Panel

10:30-10:40

Introduction of panelists and purpose of panel

10:40-11:15

Introductory remarks by panelists

11:15-11:45

Moderated discussion between panelists

11:45-12:00

Audience Q&A

John McWilliams

Kenneth Wee

Ned Morse

Enterprise risk management

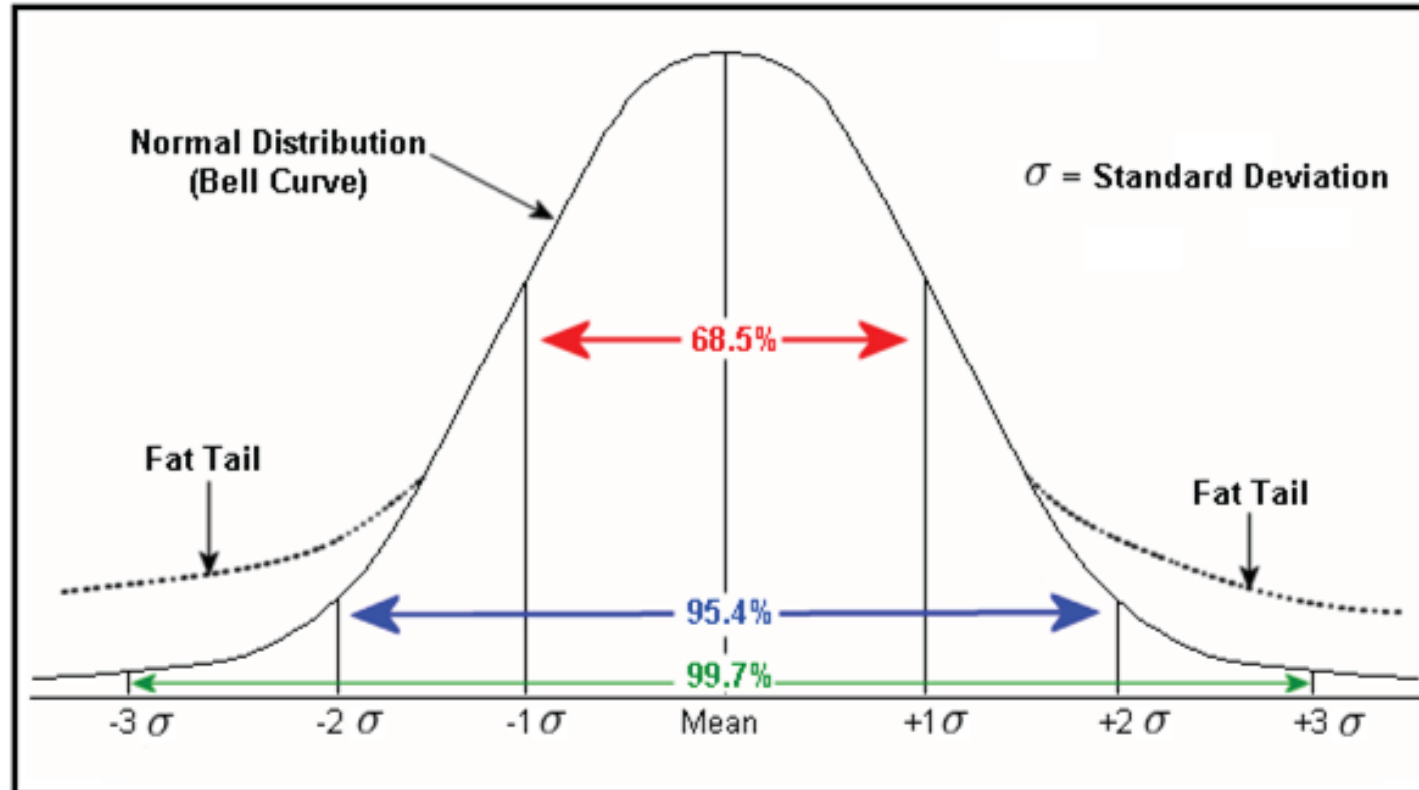
Learnings from risk management in financial services

Safety and operational risk management in oil and gas industry

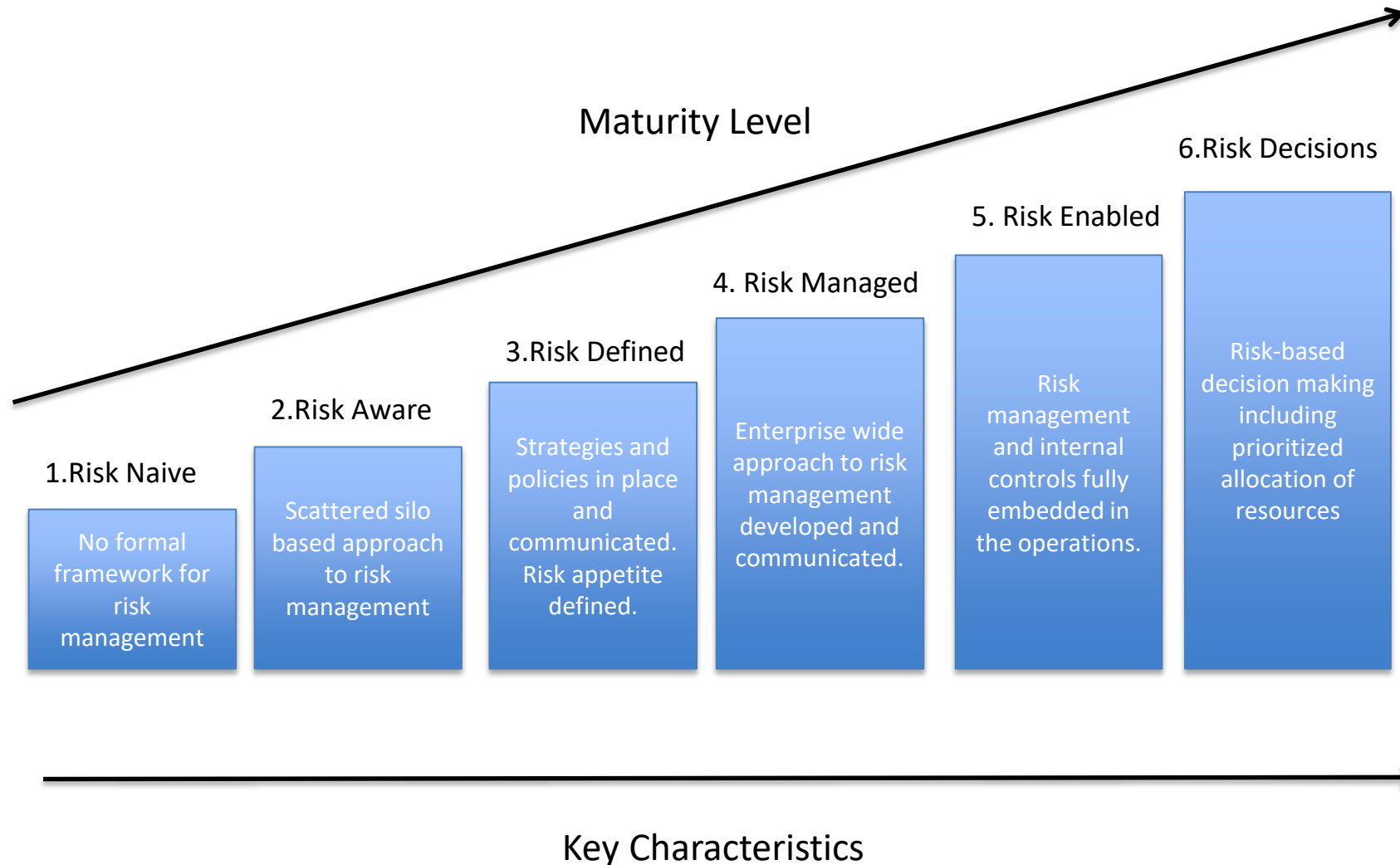
John McWilliams

Enterprise risk management

# Understanding the Distribution of Risk



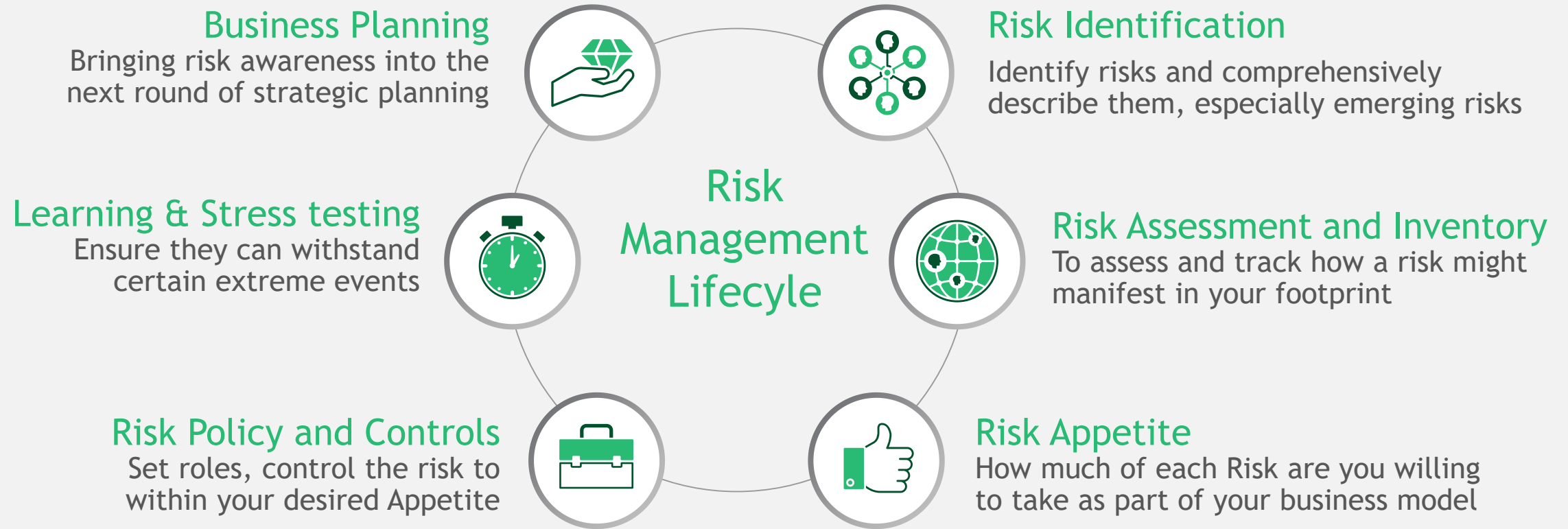
# Enterprise risk management maturity model



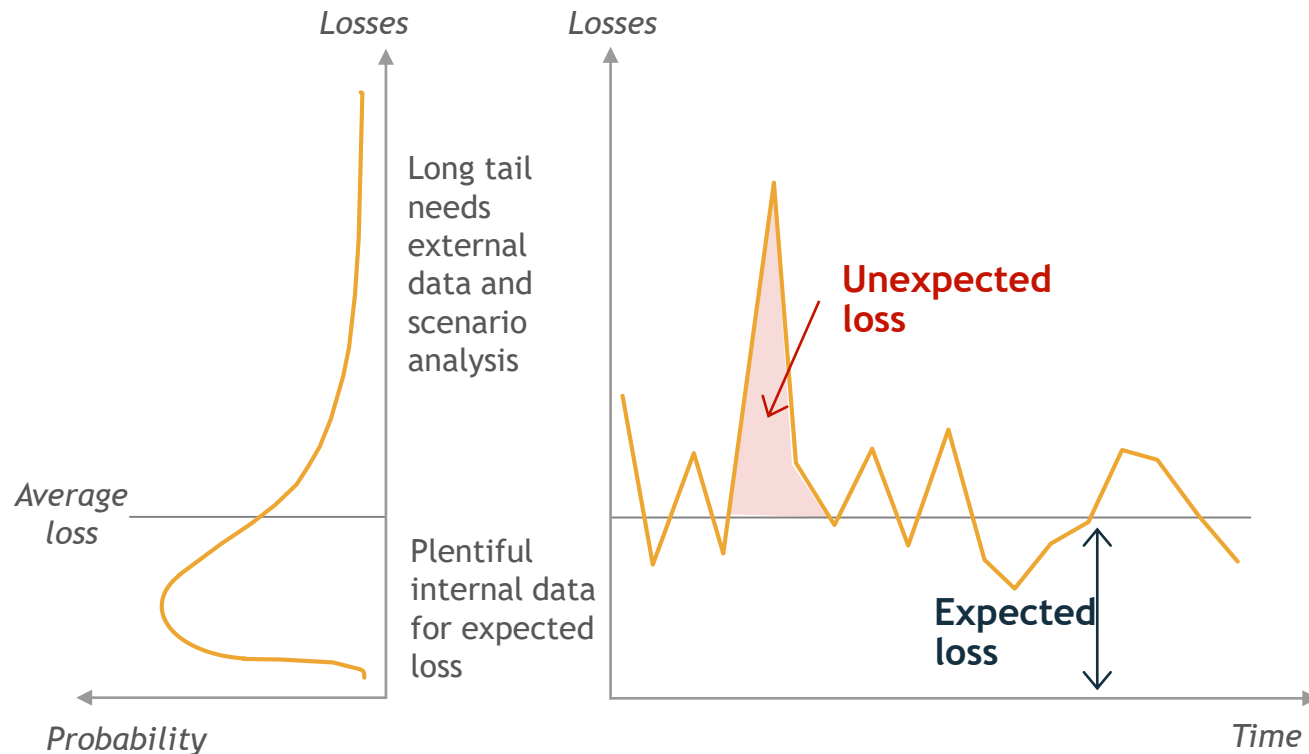
Kenneth Wee

Learnings from risk management in  
financial services

# Leading institutions manage risk through a governance process linking risk management to business planning



# A comprehensive risk management strategy needs to target both everyday losses and infrequent events that can lead to large losses



Examples of risks with long tails: internal fraud, cyber risk, market illiquidity, concentration risk, unexpected correlations, wrong-way risk

## Sources of everyday data

- Loss database: banks maintain records of operational risk losses
- Manager self-assessments: managers are required to create Risk Control Self-Assessments

## Tail risk events and data

- Investment needs to be made in understanding how big events happen and increasing resiliency to those
- With climate change tail risk can only go up, either in frequency or severity of tail events





# Tail Risk can be hard to identify!

*“Right now everything on my screen is flashing red. That doesn't make me nervous... The machine works.”*

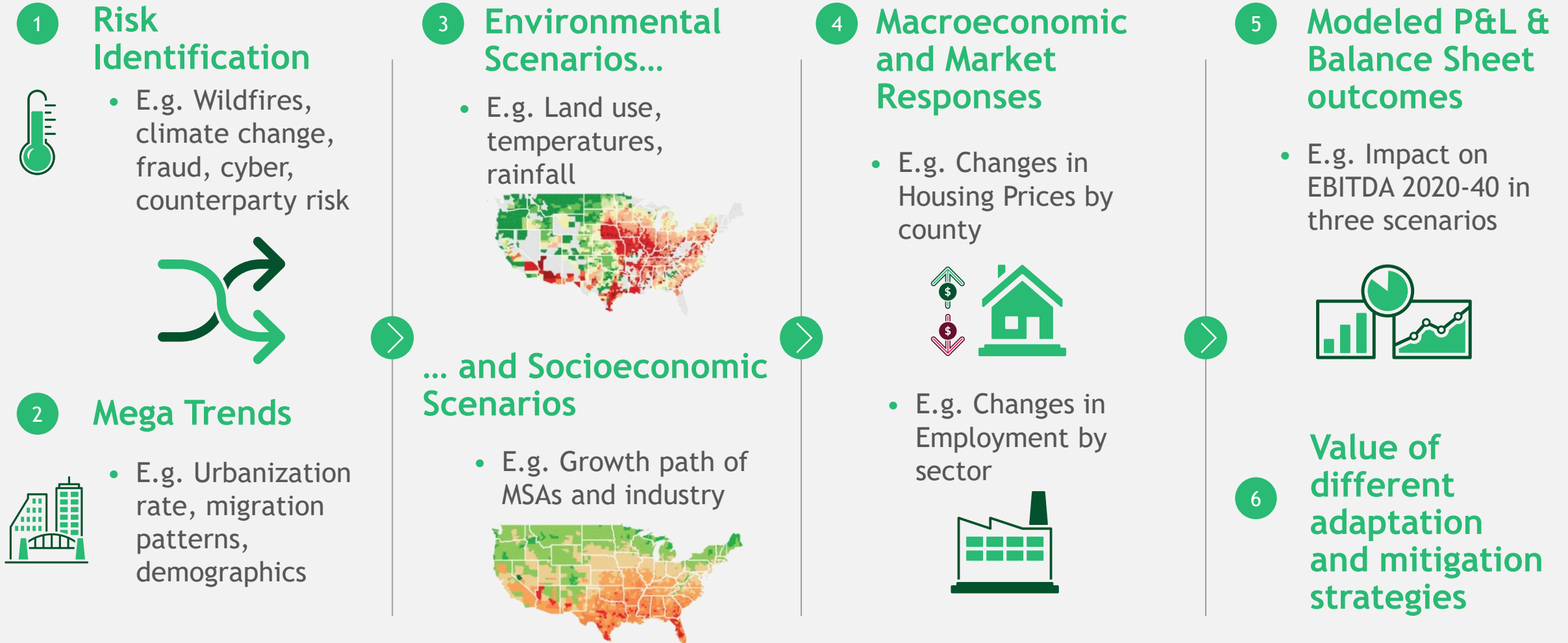
Former CRO of Bear Stearns, June 2006

## Model risk: How confident are you in the model and the data behind it? Disciplined model risk management is now in place at most large banks

		Year
 GE Capital	Liability modeling and assumptions were flawed and remained unresolved over years in the long-term care insurance which resulted in <b>\$15B</b> additional reserves	2018
 TRANSAMERICA	Charged <b>\$98M</b> by the SEC - "for their failure to take reasonable steps to ensure the models worked as intend and for contributing to the company's compliance failings"	2018
JPMORGAN CHASE & CO.	Flawed risk management models allowed a trader to accumulate huge short positions on CDX products distorting market prices. <b>\$6.2B loss</b> incurred by the company and congressional hearings and investigations by the Federal Reserve, SEC, FBI followed	2012

When you use a model, do you know what its key assumptions are?  
Do you know its limitations? How much data was it built on?  
What manual adjustments does it contain (to data, coefficients, etc.?)  
Do you know when it needs re-calibrating?

# An ideal scenario analysis process links risk factors to the value of business and mitigation strategies, to aid in capital allocation



# What can we do to improve risk management throughout an industry?



Encourage data collection and pooling



Publish best practices, conduct horizontals



Invest in technology, front-to-back reporting



Tone-from-the-top: risk governance is important



Embed risk management into operational culture



Create KRIs and a link to compensation



Creating consistency in stress scenarios



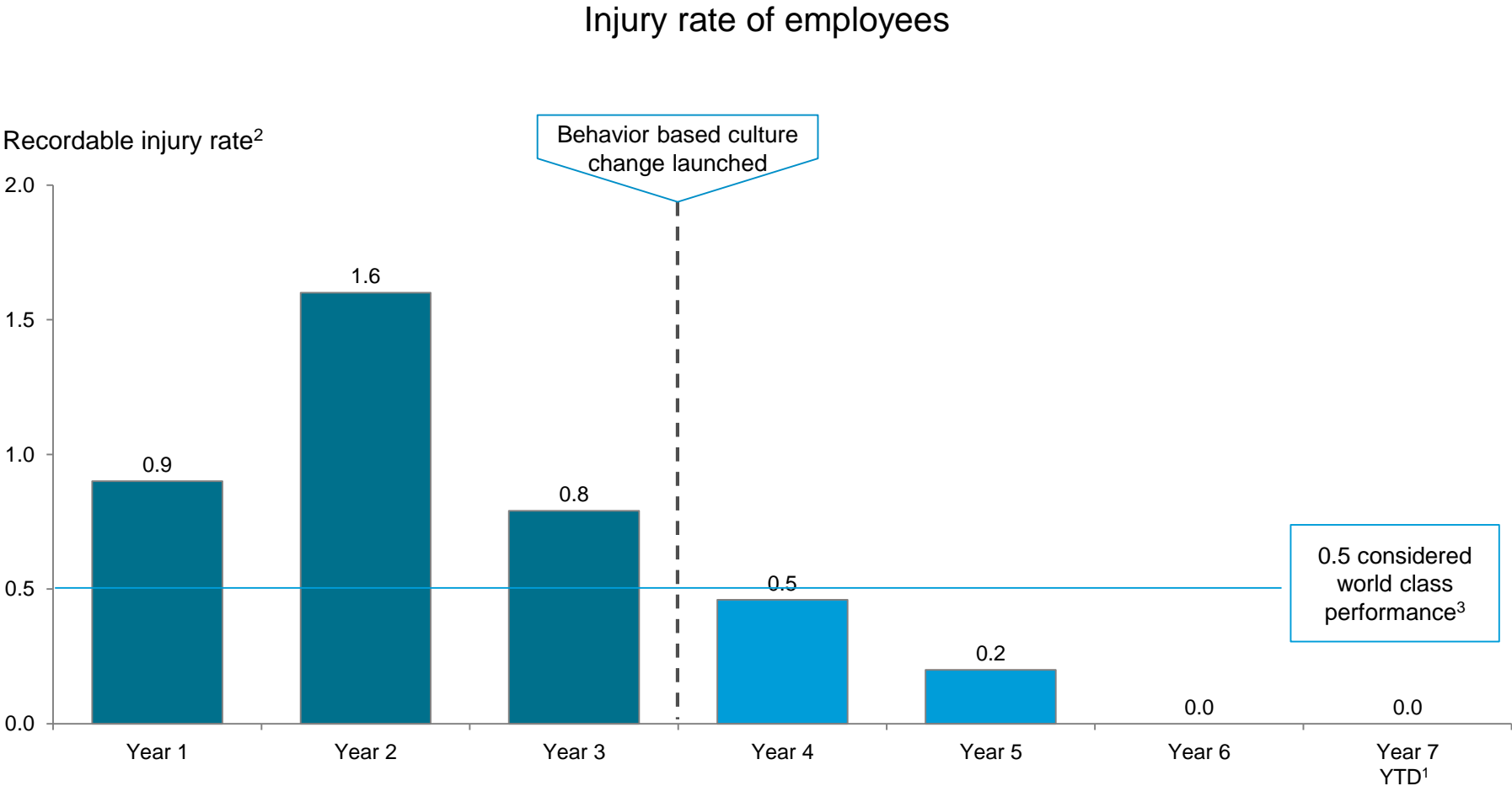
Taking a risk-based selective approach

**Ned Morse**

Safety and operational risk management in  
oil and gas industry

# Dramatically improved safety at major West Coast refinery

Achieving 2 years without a recordable employee injury<sup>1</sup>

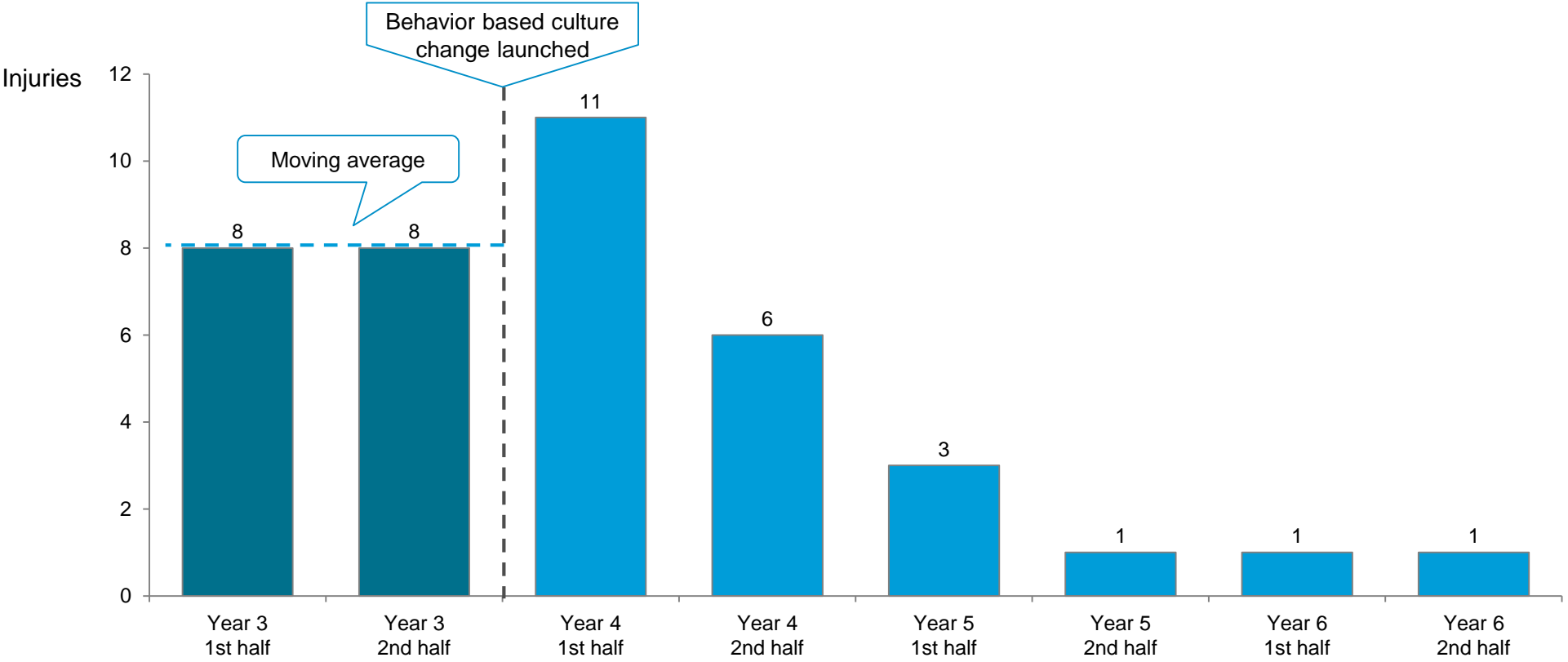


Oil refinery 1

1. YTD at time analysis conducted 2. Injuries per 200,000 hours worked 3. Per Solomon benchmark report for EDC group 5 & 6

# Reduction in number of injuries to contractors at major West Coast refinery

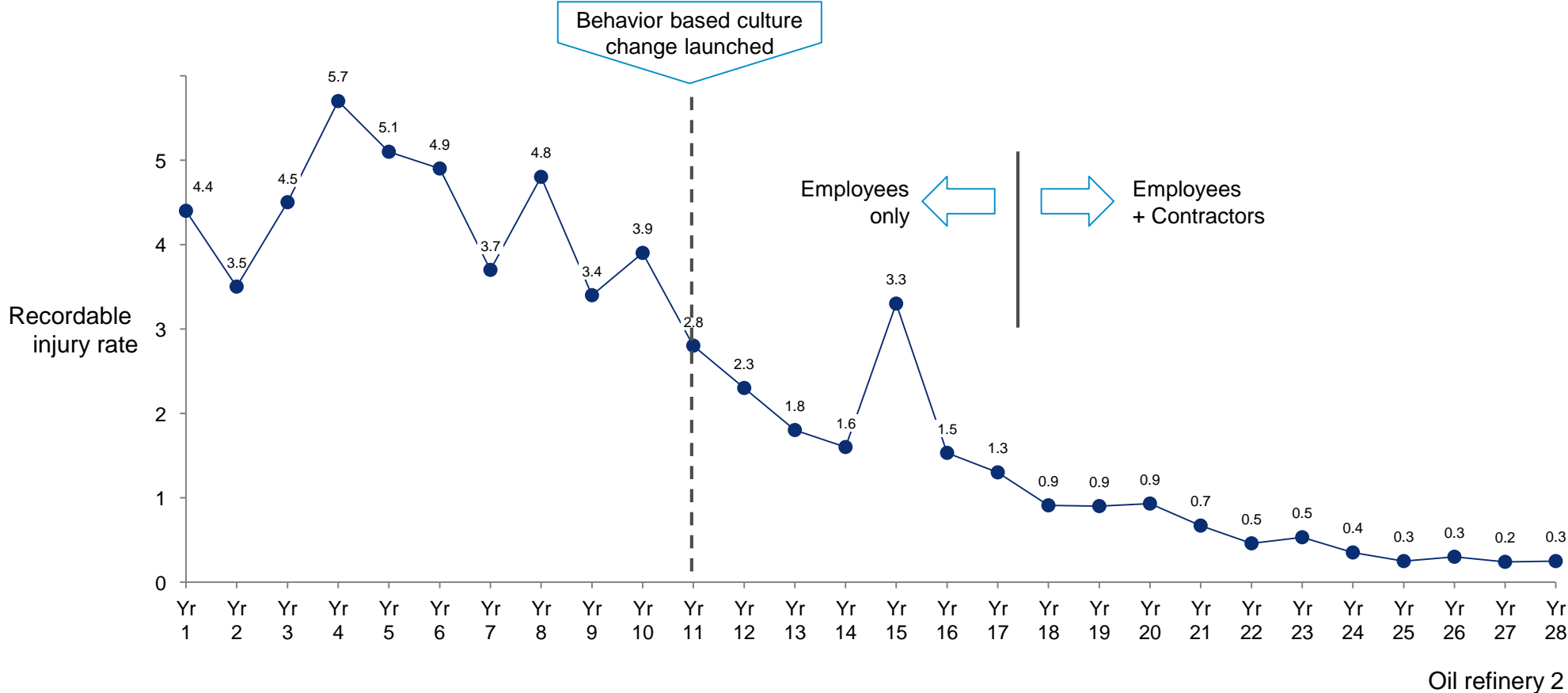
Injury levels of contractors



Oil refinery 1

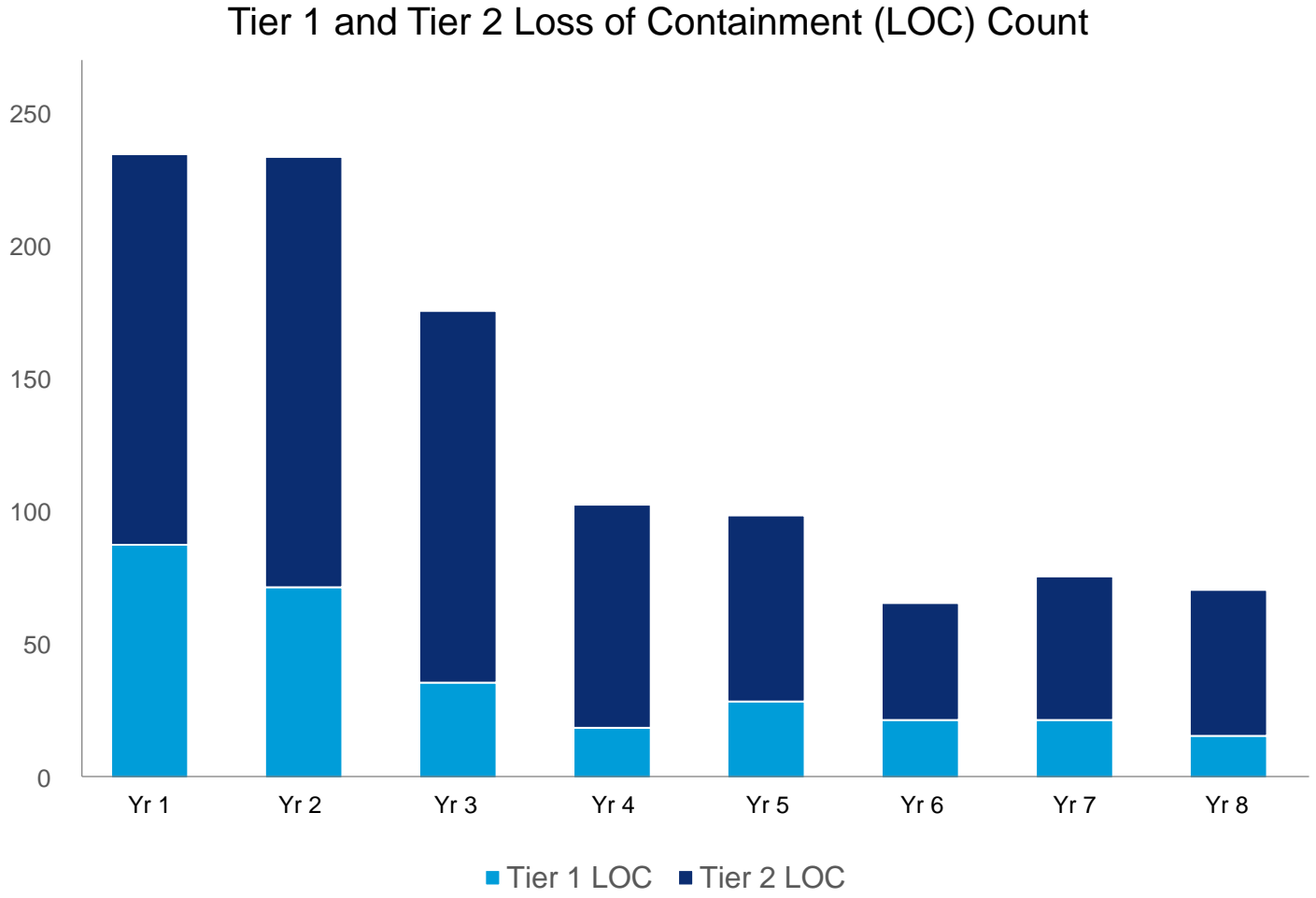
# Sustained decline in recordable injury rate in very large Gulf Coast refinery

Recordable injury rate at a refinery





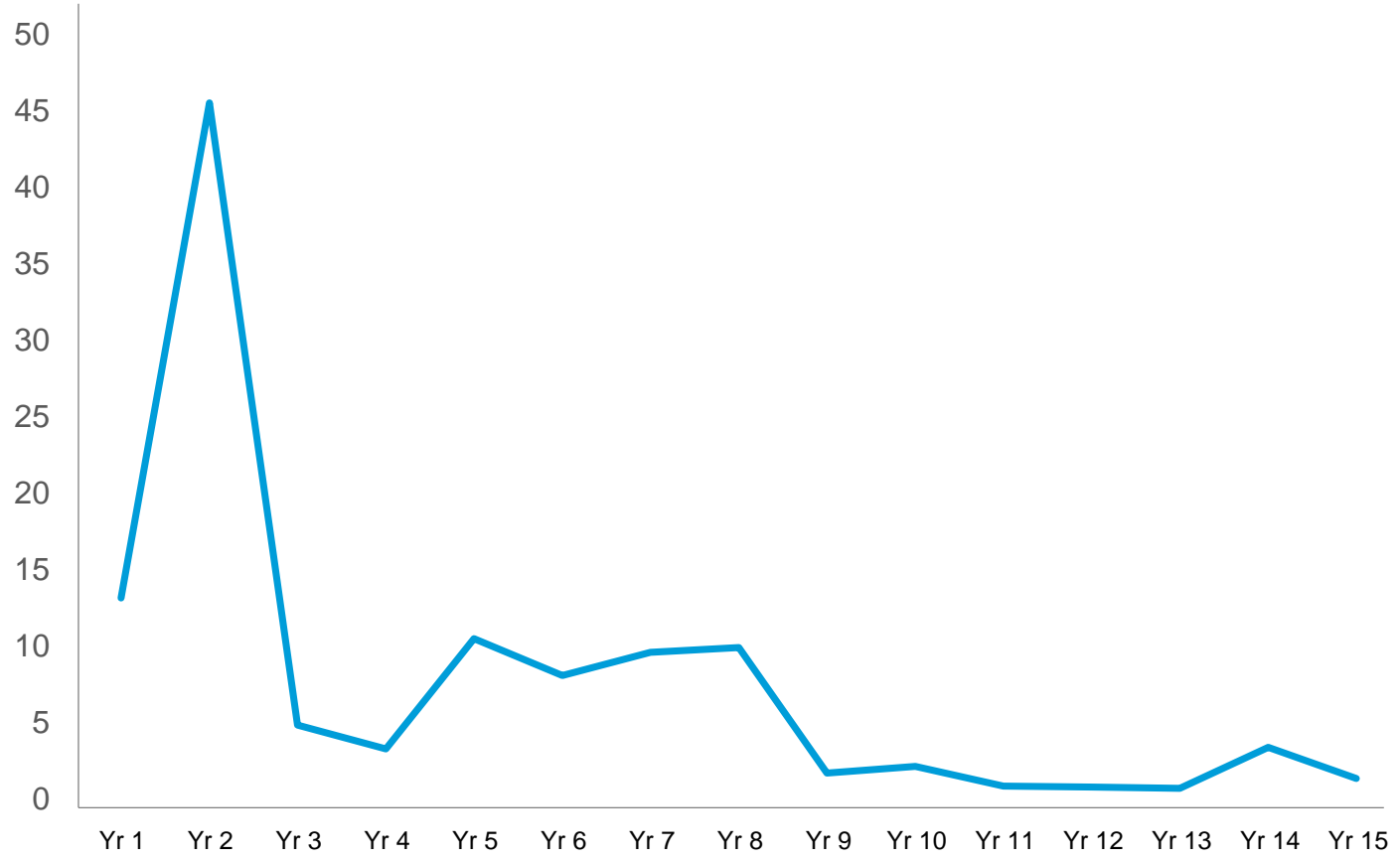
# Oil major able to drive down LOC events and spills (I)



Oil Major

# Oil major able to drive down LOC events and spills (II)

Petroleum Spill Volume to Land and Water



Oil Major

# Discussion and Q&A