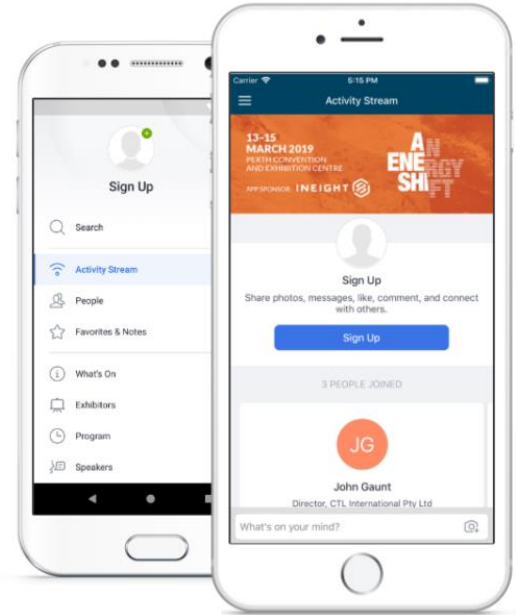


#AOG 2019

- Download the free-to-download AOG 2019 app
- Search for 'AOG 2019' to find the app.
- Connect and network with peers in the oil and gas industry at this year's event
- Plan your day by selecting which sessions you want to attend.
- Don't forget hashtag #AOG2019"



Structural Integrity Management - Through the lifetime of an asset

Ruth Baker



Structural Integrity

Fit for Purpose for the remaining lifetime



Semi Submersible with Fatigue Crack

Progressive Failure
123 deaths

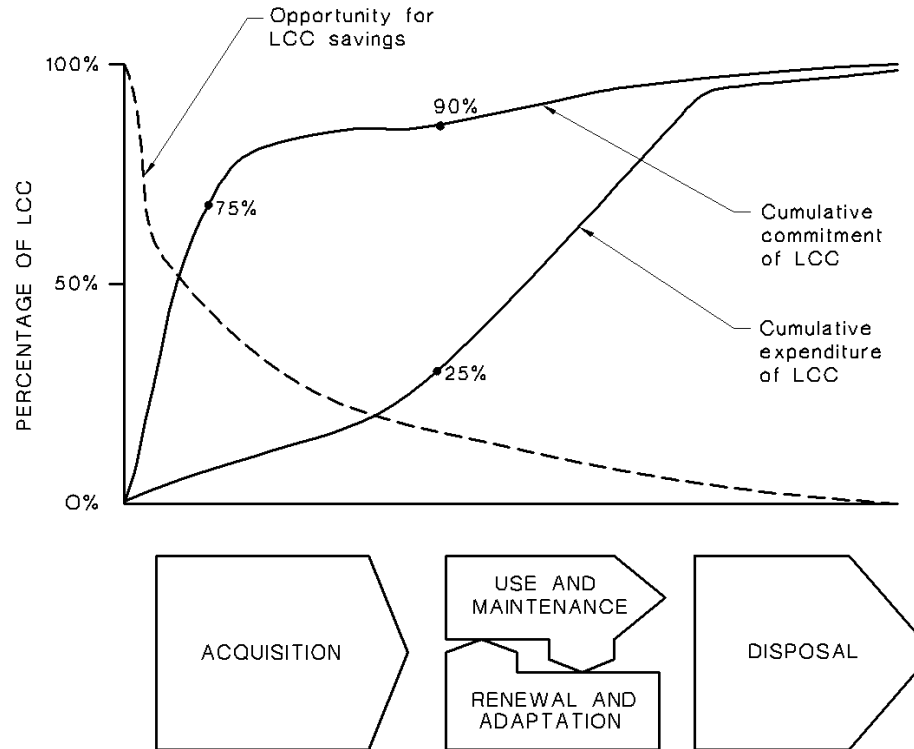
Rottneest Bridge Failure
112 year old structure
3 injuries



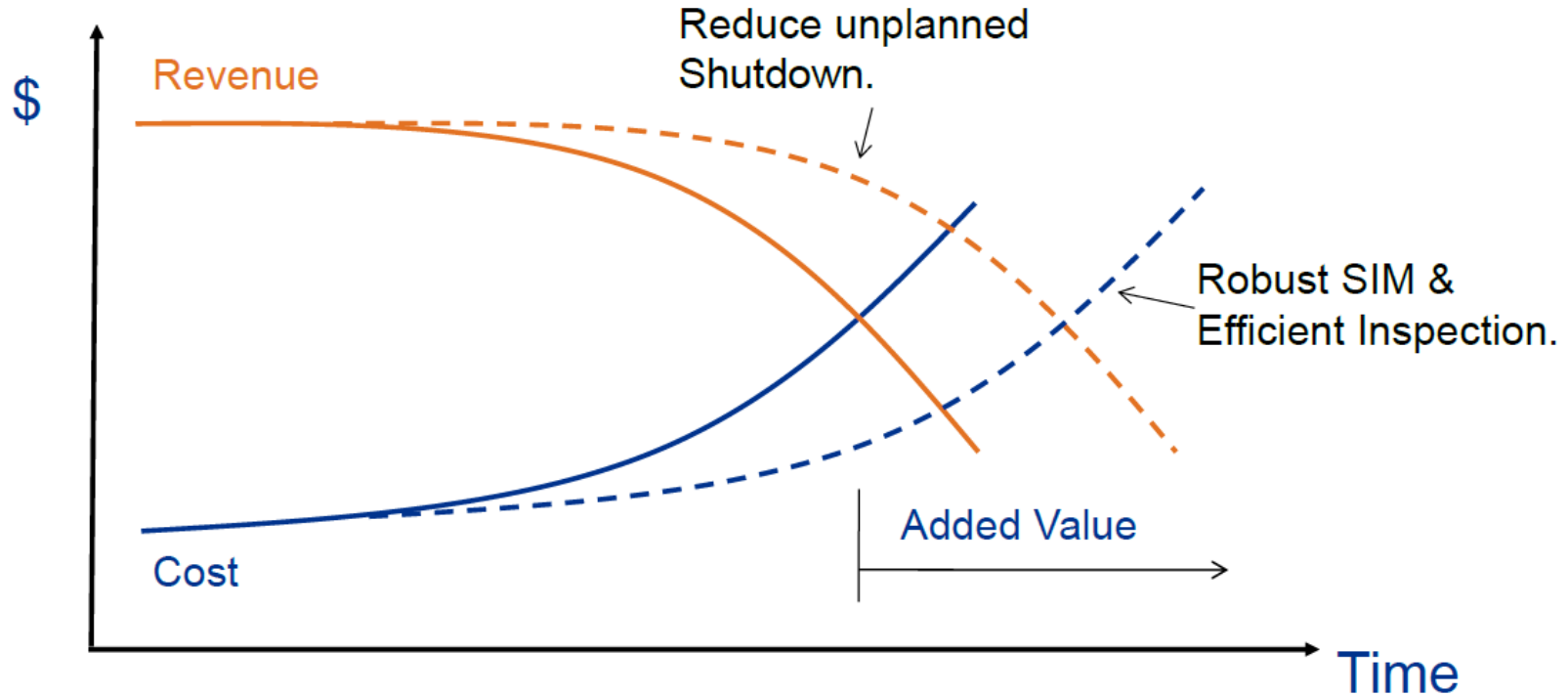
The Asset Life Cycle



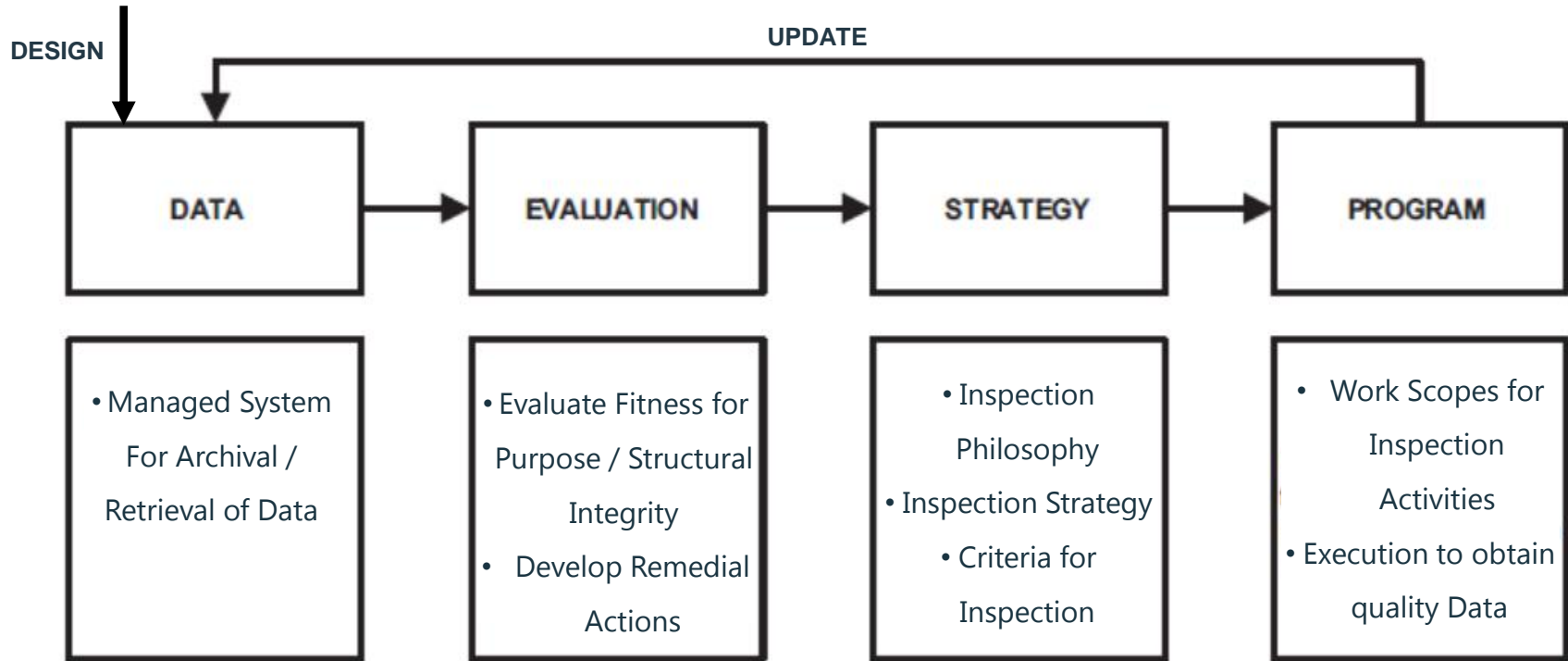
Percentage Costs through out the Life Cycle



SIM and OPEX



Structural Integrity Management



Structural threats...

Understand and quantify risks to a structure:

Corrosion	Coating Breakdown	Concrete Cracking	Fatigue Cracking	Foundation Settlement/ Erosion
Lack of Inspectability	Overload from Upgrades / Additions	Accidental Events	Depletion of Cathodic Protection	Revised Met-ocean Data



Assessing Risk...

Consequence					Increasing Annual Frequency					
Severity Rating	People	Assets	Environment	Reputation	0	A	B	C	D	E
					$<10^{-6}$	$\geq 10^{-6}, <10^{-4}$	$\geq 10^{-4}, <10^{-3}$	$\geq 10^{-3}, <10^{-1}$	$\geq 10^{-1}, <1$	≥ 1
					Practically non credible failure	Rare Failure	Credible failure		Probable failure	Frequent failure
					Could occur but has not necessarily been observed in E&P industry	Has rarely occurred in E&P industry	Has occurred several times in E&P industry	Has occurred in operating Company	May occur several times a year in operating company	Will Occur routinely in an individual plant
0	Zero injury	Zero damage	Zero Effect	Zero Impact						
1	Slight injury	Slight damage	Slight Effect	Slight Impact						
2	Minor injuries	Minor Effect	Minor Effect	Minor Impact						
3	Major injuries	Local Damage	Local Effect	Considerable Impact						
4	Single Fatality	Major Damage	Major Effect	National Impact						
5	Multiple Fatalities	Extensive Damage	Extensive Effect	Major International Impact	SPE 2010					



Assessing Risk.. to Influence Design



Identify

Determine the **threats** to the structure.



Assess

Review all available data to fully **assess the risks** the threats pose.



Respond

Solve critical operational problems, either by **mitigating** or by altering the basis of design.

Align Design with Operational Strategies

Align

- Ensure final design supports key structural integrity management strategies

Evaluate

- Develop structural analysis models to support fitness for service evaluations

Inspect

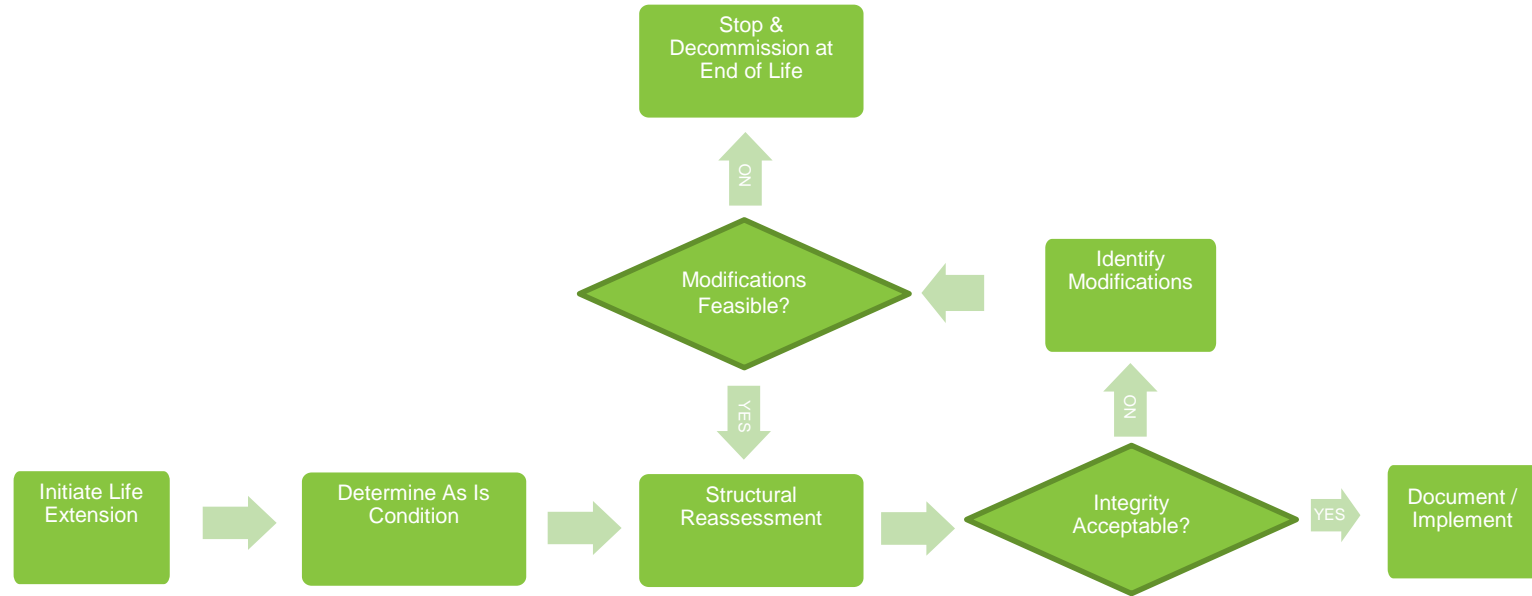
- Select risk based or prescriptive inspection planning strategy
- Baseline inspections

Monitor

- Identify monitoring required throughout lifetime
- Baseline measurements



SIM to Support Life Extension



SIM Through the Lifetime of an Asset

Fit for
Purpose for
the remaining
lifetime

High
commitment of
life cycle costs
by the end of
EPC

Assess
Operations
during **Design**

Understand the
risk to your
structure
during all
phases of life

Mitigate the
risks safely and
cost effectively

Decrease
unplanned
shutdowns &
rationalise IM
costs

Adds value
during **Life**
Extension &
Decommission
ing
Assessment

Decommissioning



.....but not prematurely!

wood.

Thank you.