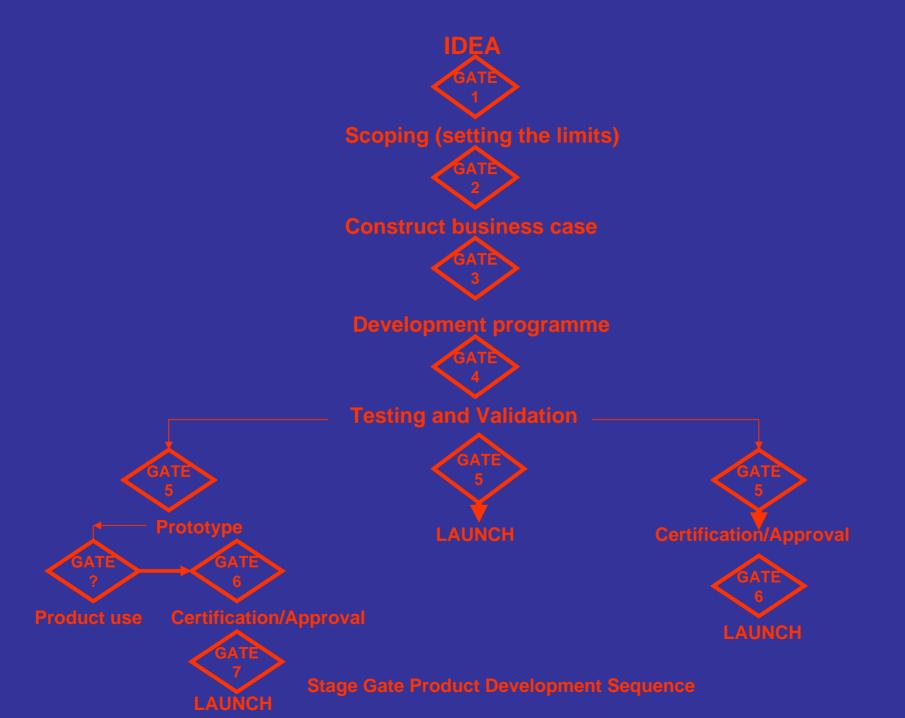
Assessing the Risk Innovation by Peter C Hewlett* Communication Conference 1-2 September 2008 Liverpool, UK

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"No construction project* is free of risk.

Risk can be managed, minimised, shared, transferred or accepted. It cannot be ignored"

Sir Michael Latham (Godfrey 2004)

*For this work project should read product.

FMEA-Analytical but qualitative-Interfaces and interactions-Consider what is at risk

How could a component fail? What would cause a component to fail? What are the consequences of component failure? How serious are these failure scenarios? Can incipient failure be identified?

FMECA

- Prioritises interactions from FMEA
- Rank the effects in order of importance (criticality)
- Identifies where information may be needed
- Can indicate preventative action at design and installation stage
- May highlight a failure even sequence

The level of risk is the product of 3 factors:

Probability of failure

Severity of failure

Likelihood of detection (before damage is evident)

Level of risk = probability x severity x detectability

A range of 1-5 may be attributed to each factor

Level of Risk = Risk Priority Number (RPN)

Maximum Score	=	5 x 5 x 5
	=	125
Low Risk	=	1 – 40
Definite Risk	=	40 - 80
Unacceptable Risk	=	80 – 125

Probability of Failure

Level/score	Extent	Description
5	Frequent	Likely to occur frequently
4	Probable	Likely to occur several
		times in the product life
3	Occasional	Likely to occur sometime
		in the life of a product
2	Remote	Unlikely to occur but
		possible
1	Improbable	Very unlikely

Severity of Failure

Level/score	Extent	Description
5	Catastrophic	Failure causes complete system loss and/or potential for fatal injury
4	Critical	Major damage to system and/or potential for serious injury
3	Serious	Significant damage to system and/or potential for injury
2	Marginal	Failure may occur with serious damage to system or personnel
1	Negligible	No potential for damage or injury

Detection of Likely Failure

Level/score	Extent	Description
1	Obvious	Readily detectable before failure
2	Readily detectable	Likely to be detected before failure
3	Detectable	Moderate chance of potential failure being detected
4	Difficult to detect	Rarely detected before failure
5	Impossible	So unlikely that
	to detect	occurrence may not be experienced

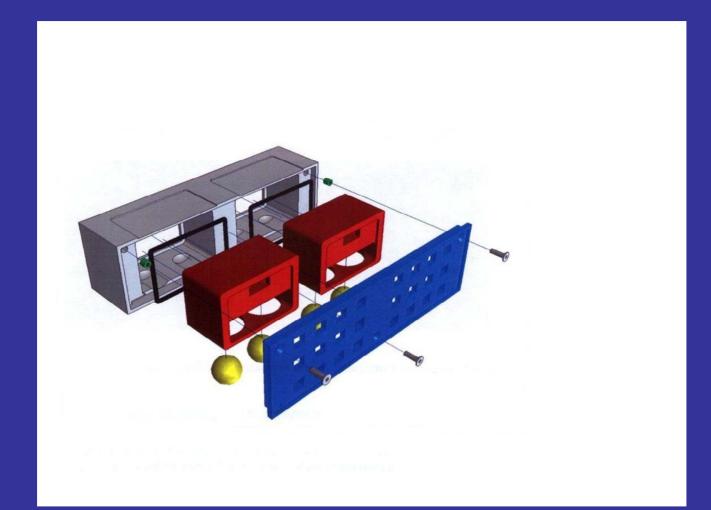
Example

Smart Airbrick (SAB)

British Patent GB2397592 26th January 2004

Eco Coverage Technologies





Smart Air Brick

8 Interfaces considered

3 Critical elemental functions

- Compatibility of materials, product/building
- Operation of ball valve system
- Structural response in situ

RPN Scores

Ball Valve Operation	27
Materials Compatibility	18
Structural Response	<u>18</u>
Total	63
Average	21

Additional Examples

Roof window that acts as a skylight (RPN = 32-48)

High friction road surfacing system (RPN = 8-48)

Conclusions & Recommendations

- 1. Encourage adoption of FMEA/FMECA methodologies when dealing with highly innovative and/or prototype construction building products.
- 2. Integrate FMEA/FMECA into product performance based assessments.
- 3. Present the information such that residual risk/benefit judgements can be made.
- 4. Consider ways of adapting FMEA/FMECA to make tailored to construction and building products.