WP 4 Lifetime data and systematics for presenting lifetime data

Phil Bamforth

Taylor Woodrow

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- Objectives
  - Identification of current sources of cost and performance data and how it is collected and stored
  - Identification of how lifetime data is currently used to optimise lifetime costs and performance of assets

Questionnaire

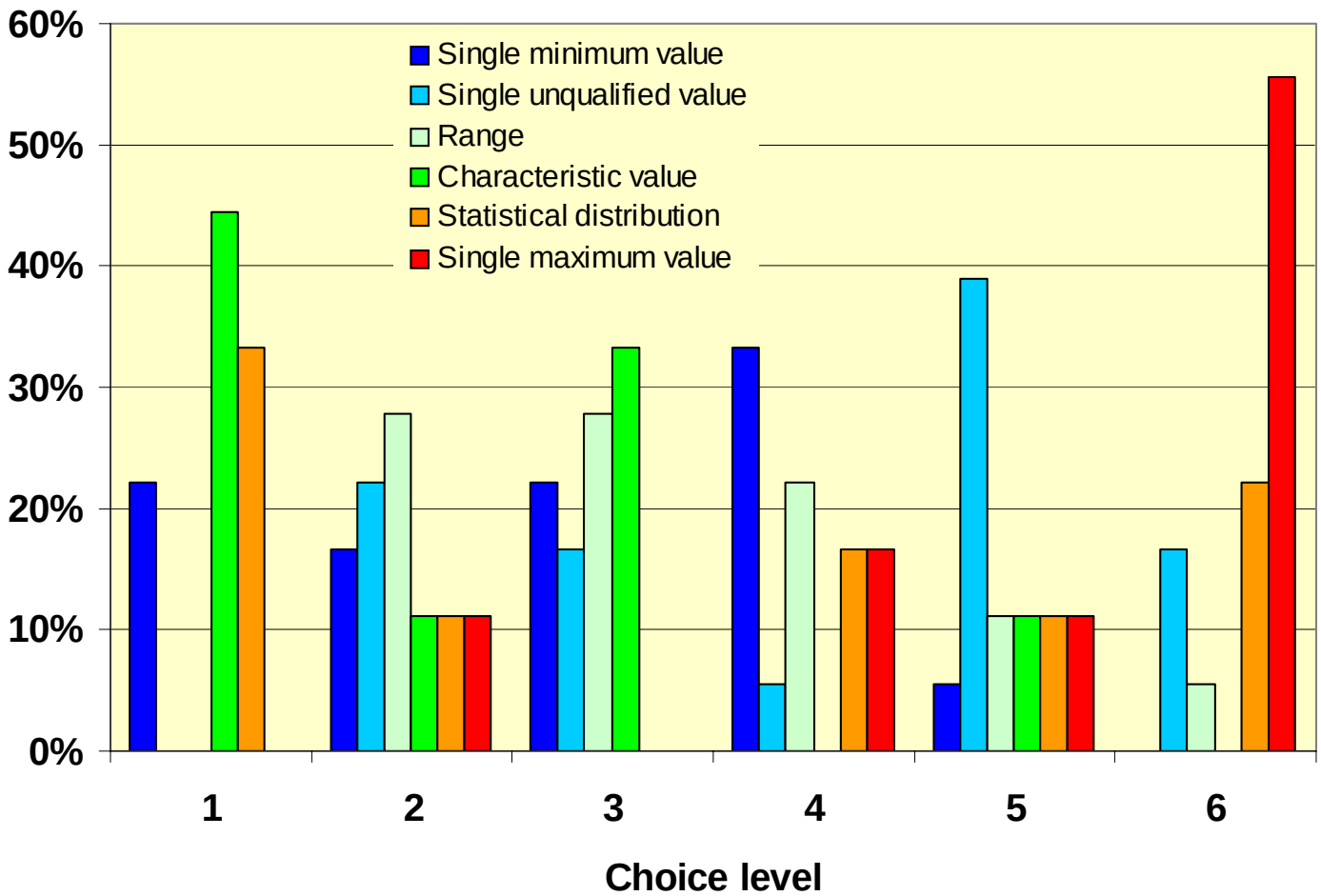
- How do you believe Service or Design Life should be defined?
- What factors should be used to qualify the value of service life?
- What lifetime data is available?
- Where do you get information relating to the service life of specific elements, components, materials etc. and how reliable is it?
- How is lifetime data presented?
- How is the data applied?
- What do you consider to be the greatest limitations with lifetime data currently available?

How should Service Life be defined?

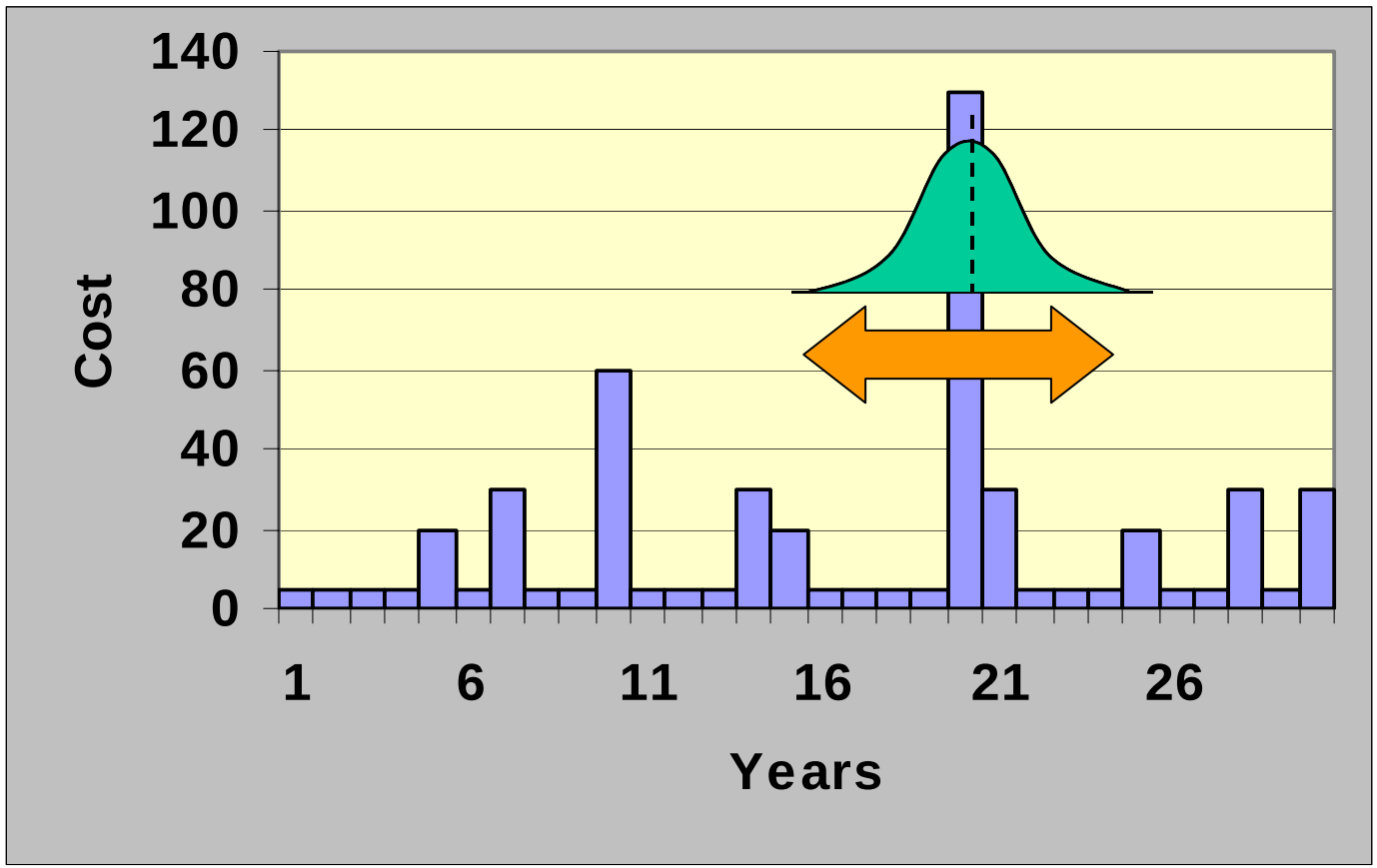
Scale from 1 best to 6 worst

Definition of service life	UK	Lifetime
Single characteristic value, e.g. 95% exceeding 15 years	3.58	2.22
Single minimum value, e.g. at least 15 years	2.42	2.83
Distribution, e.g. mean of 20 years with SD of 3 years	3.73	3.23
Range, e.g. 15 to 25 years	3.28	3.35
Single value (unqualified), e.g. 20 years	2.96	4.11
Single maximum value, e.g. not more than 25 years	4.54	5.06

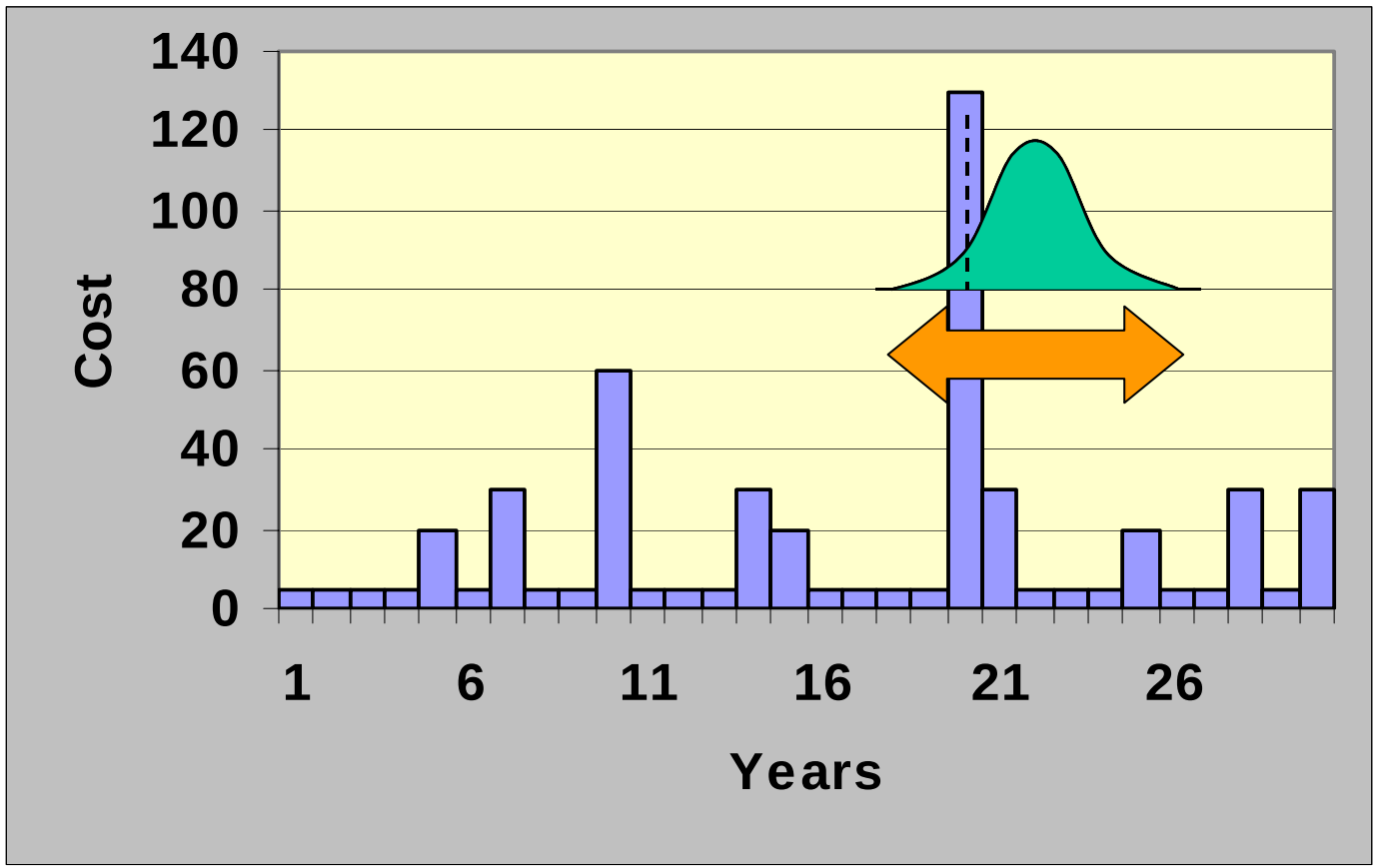
How should Service Life be defined?



Estimated WLC



Estimated WLC



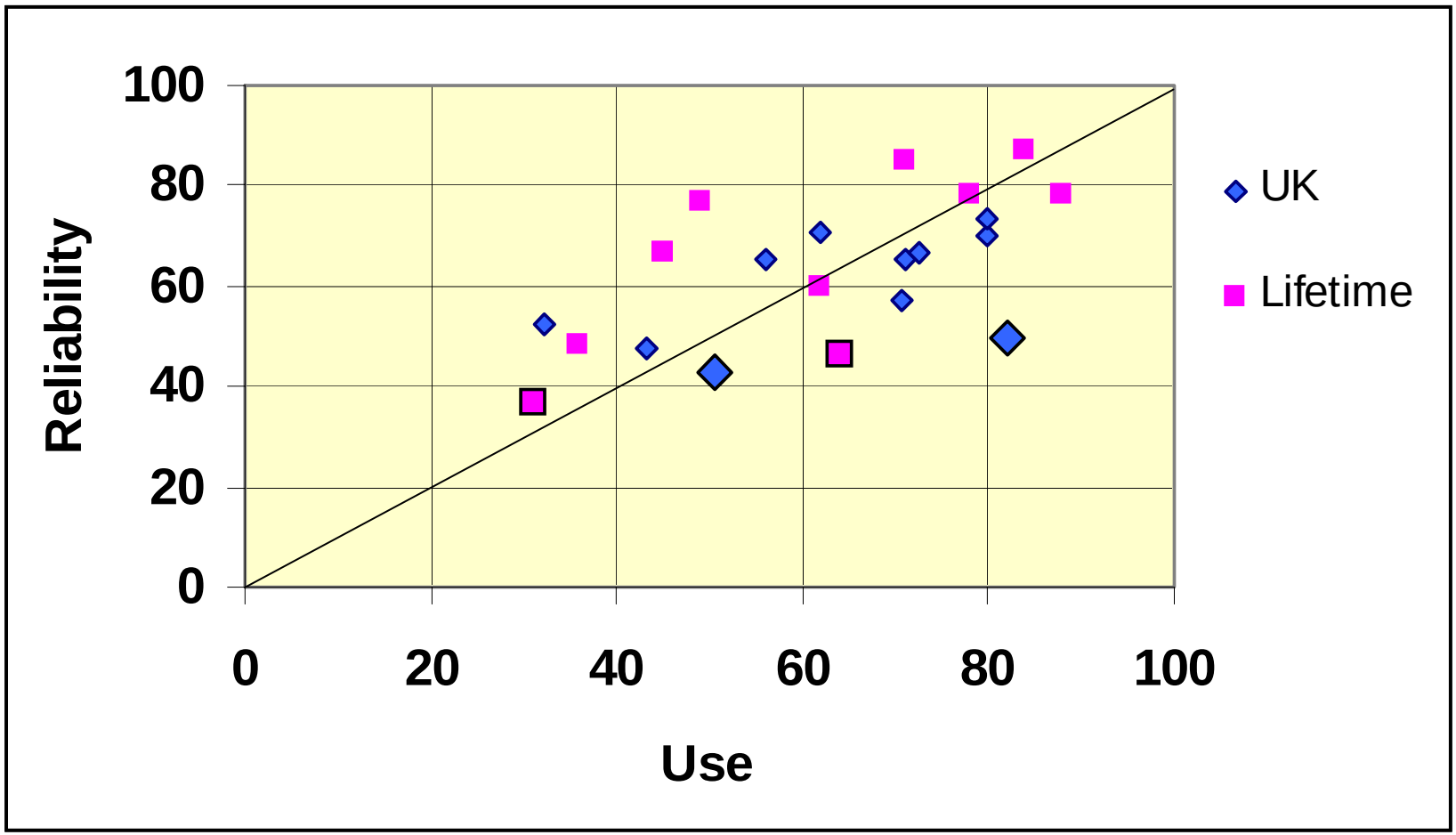
How should Service Life be qualified?

Qualification of service life	UK	Lifetime
The period	95	92
The condition (limit state), CLS, that defines the end of service life	67	90
The exposure conditions	67	88
The operating condition	71	69
The deterioration mechanism(s) leading to the CLS	53	65
The maintenance regime	73	63
The probability of the CLS being achieved within the service life	48	60
The consequences of achieving the CLS	48	58

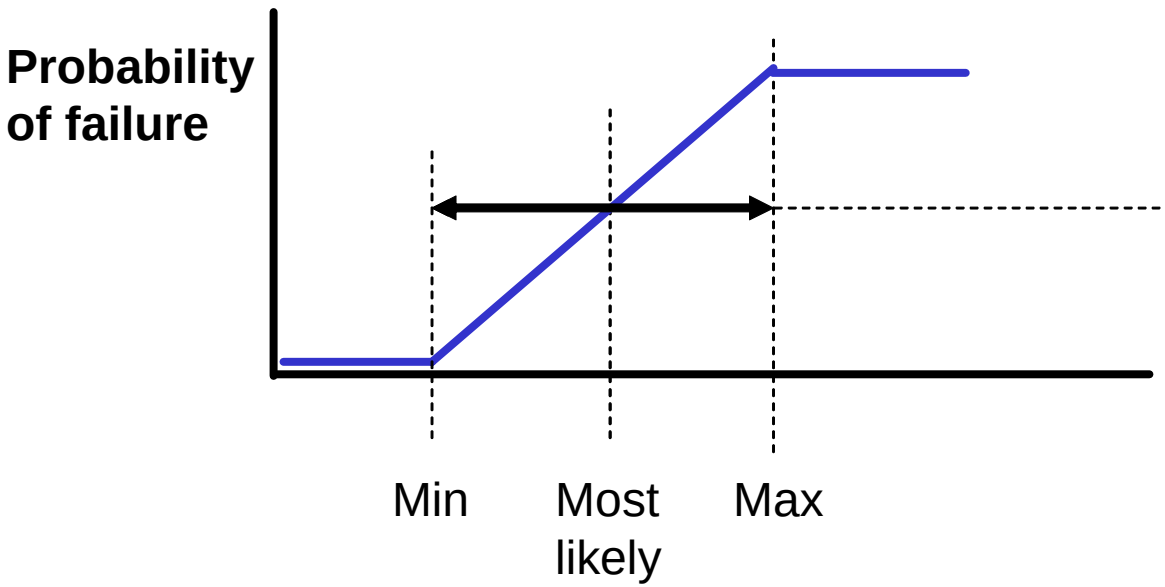
Preferred sources of information

	UK		Lifetime	
Information sources	**Use**	**Reliability**	**Use**	**Reliability**
In-house expertise	**80**	**70**	**88**	**78**
Previous projects	**80**	**74**	**84**	**87**
Personal experience	**71**	**65**	**78**	**78**
Research Institutes	**62**	**71**	**71**	**85**
Product suppliers	**82**	**49**	**64**	**46**
National Guidance Documents	**71**	**57**	**62**	**60**
Universities	**32**	**52**	**49**	**77**
Codes and standards	**73**	**67**	**45**	**67**
Professional Institutions	**56**	**65**	**45**	**67**
Commercial databases	**43**	**48**	**36**	**48**
Trade Associations	**51**	**43**	**31**	**37**
	Mean	**60**	Mean	**66**

Use v reliability of SL data

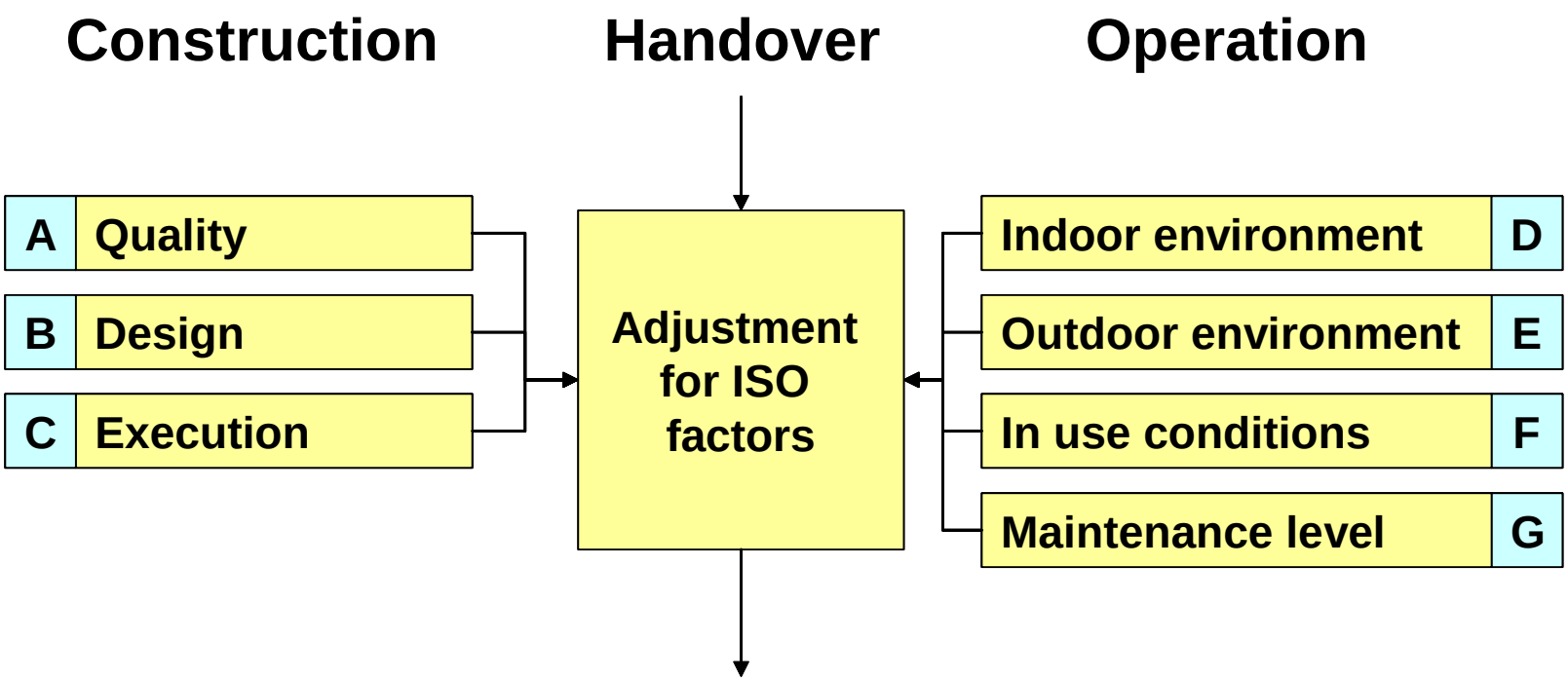


Reference service life range



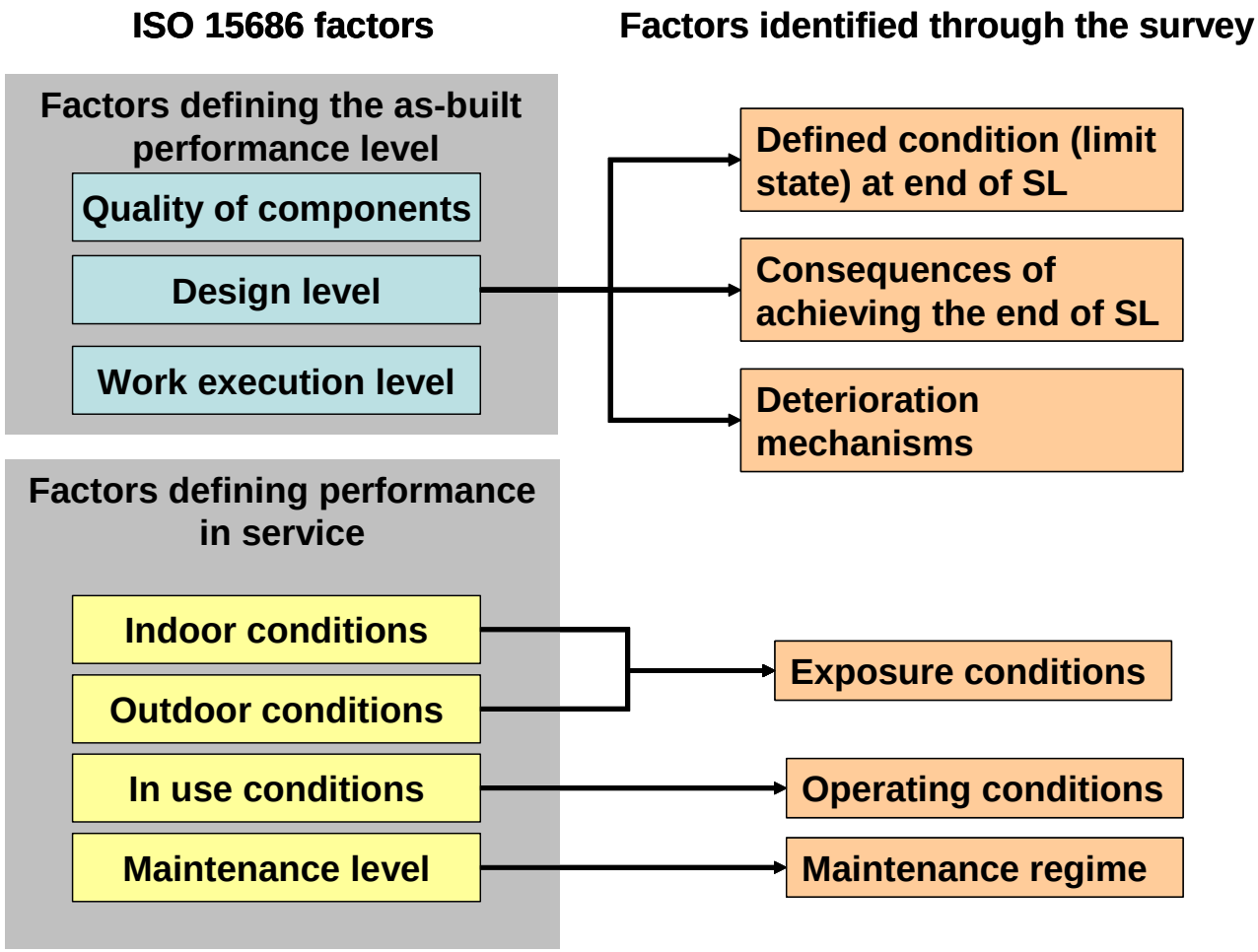
Reference range of service life from background data, e.g. BMI data

ISO 15686 factors

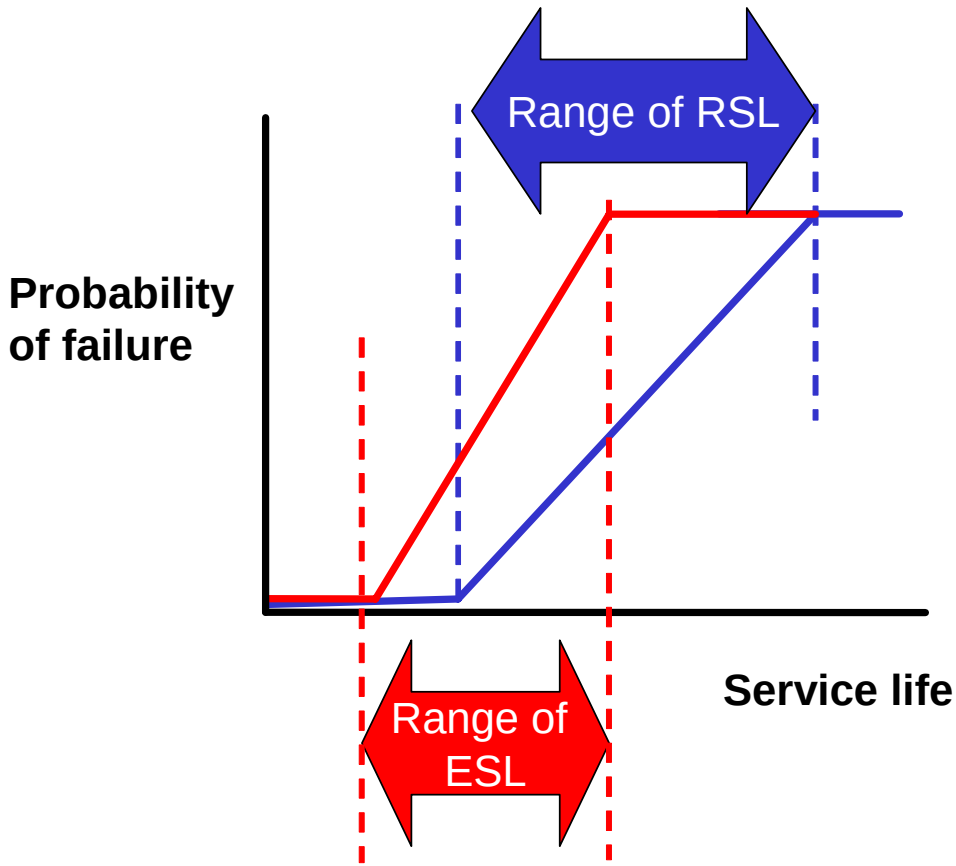


ESL = RSL x A x B x C x D x E x F x G

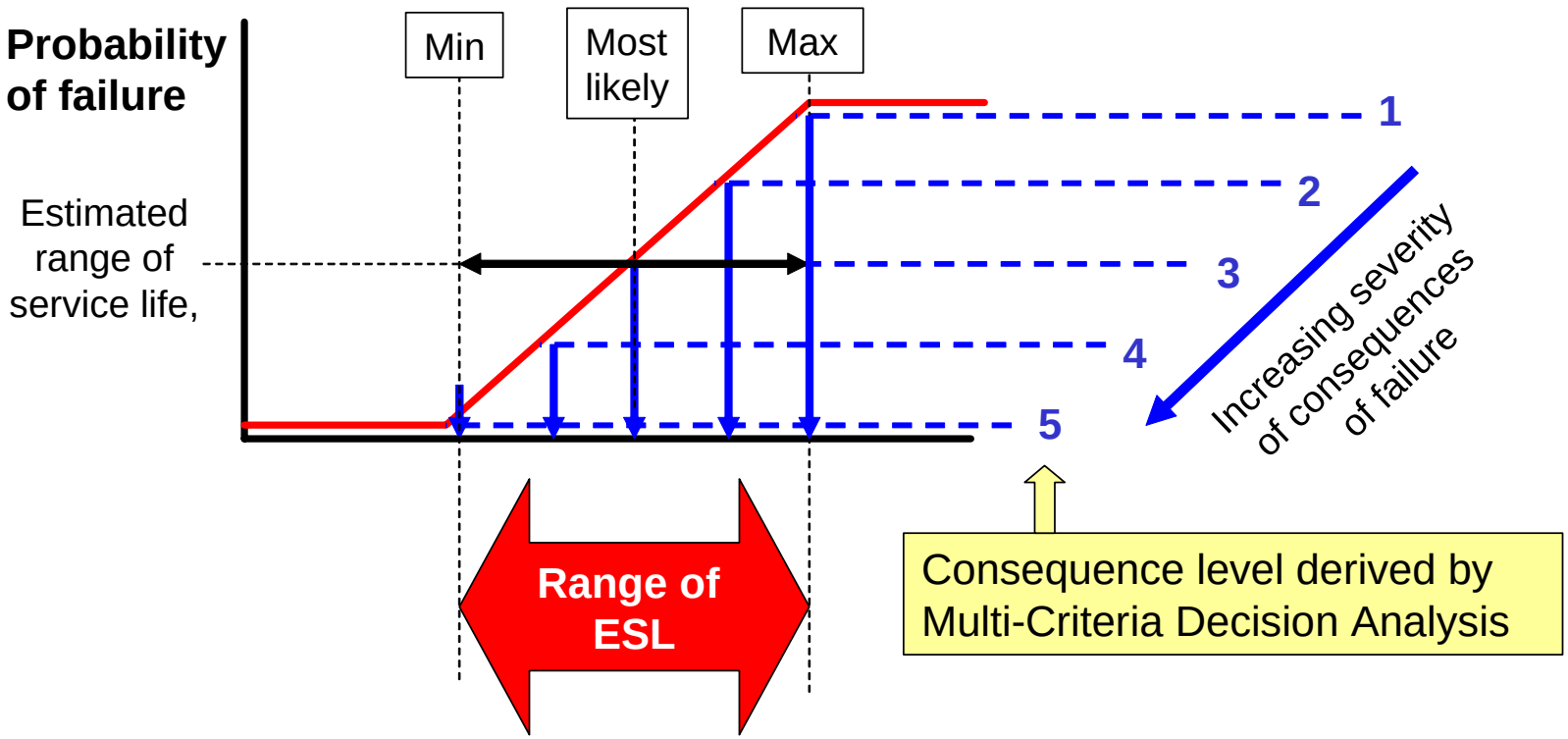
ISO 15686 factors and survey results



Estimated Service Life



Management of risk



General Conclusions

- Cannot start the process of Lifetime design with being able to estimate performance and times to intervention
- Cost data is less critical – it is very contract specific
- SL data must be presented statistically to enable rigorous management of risk and cost optimisation - but presented simply
- SL data must be qualified to enable project specific application

Future Activities

- Complete the recommendations for presentation of lifetime data
  - Definition
  - Qualification
- Offer guidance on use of statistical methods and the use of the ISO 15686 factorial method, or similar.
- Obtain view from Network Partners
- Prepare an Interactive Workshop

Interactive Workshop

- Introduction
- View from a practitioner
- Service Life Design
- Cost structures and models
- Environmental and Societal issues
- The integrated process

An interactive exercise with run through the workshop

Interactive Workshop INTRODUCTION

- The Lifetime Network - objectives and outputs. Website references for databases
- Lifetime Design - **WHAT** is it? **WHY** is it necessary? **WHEN** is it needed? **WHO** should undertake it?.
- Dealing with uncertainty -The skill in Lifetime Design is in recognising uncertainties, understanding how real performance/cost etc may differ from estimated values and managing the associated risks.

Interactive Workshop
VIEW FROM A PRACTITIONER

- View from a ‘big hitter’. This should be someone with experience in Lifetime Design and who has sufficient authority to give credibility to the approach, e.g. Large client, regulator.
- Aim to demonstrate to delegates the real value of Lifetime Design and show that it is applied

Interactive Workshop
SERVICE LIFE DESIGN

- **WHAT** is service life design?
- **WHY** is it necessary? Predicting **'WHEN TO SPEND'**
- **ISO approach to service life design**
  - Reference service life data
  - Performance and deterioration (influencing factors)
  - Recognising uncertainty
  - Dealing with risk (e.g. of the consequences of failure)
  - Use in developing maintenance plans
- Worked example using a single building component, e.g. cladding, concrete frame (this may be selected to meet local requirements).

LIFETIME

Interactive Workshop
COSTS

- Introduction to whole life costing – i.e. deciding **WHEN TO SPEND**
- Balancing capital and operational costs
- Principles, drivers and issues

Interactive Workshop ENVIRONMENTAL & SOCIETLA ISSUES

- Environmental requirements and how to deal with them
  - Materials – Energy consumption – Waste – Pollution - Water consumption - Regulations
- Societal issues
  - Health & safety - Social inclusion, etc – Occupancy satisfaction – Regulations - Business efficiency,productivity, employee well-being
- Balancing cost and environmental and societal impacts – available tools and procedures

Interactive Workshop
THE INTEGRATED PROCESS

- Integrating cost, performance and environmental/societal issues [Balanced Value]
- Summary of feedback from the exercises
- Issues arising
- Review of delegates expectations