Health

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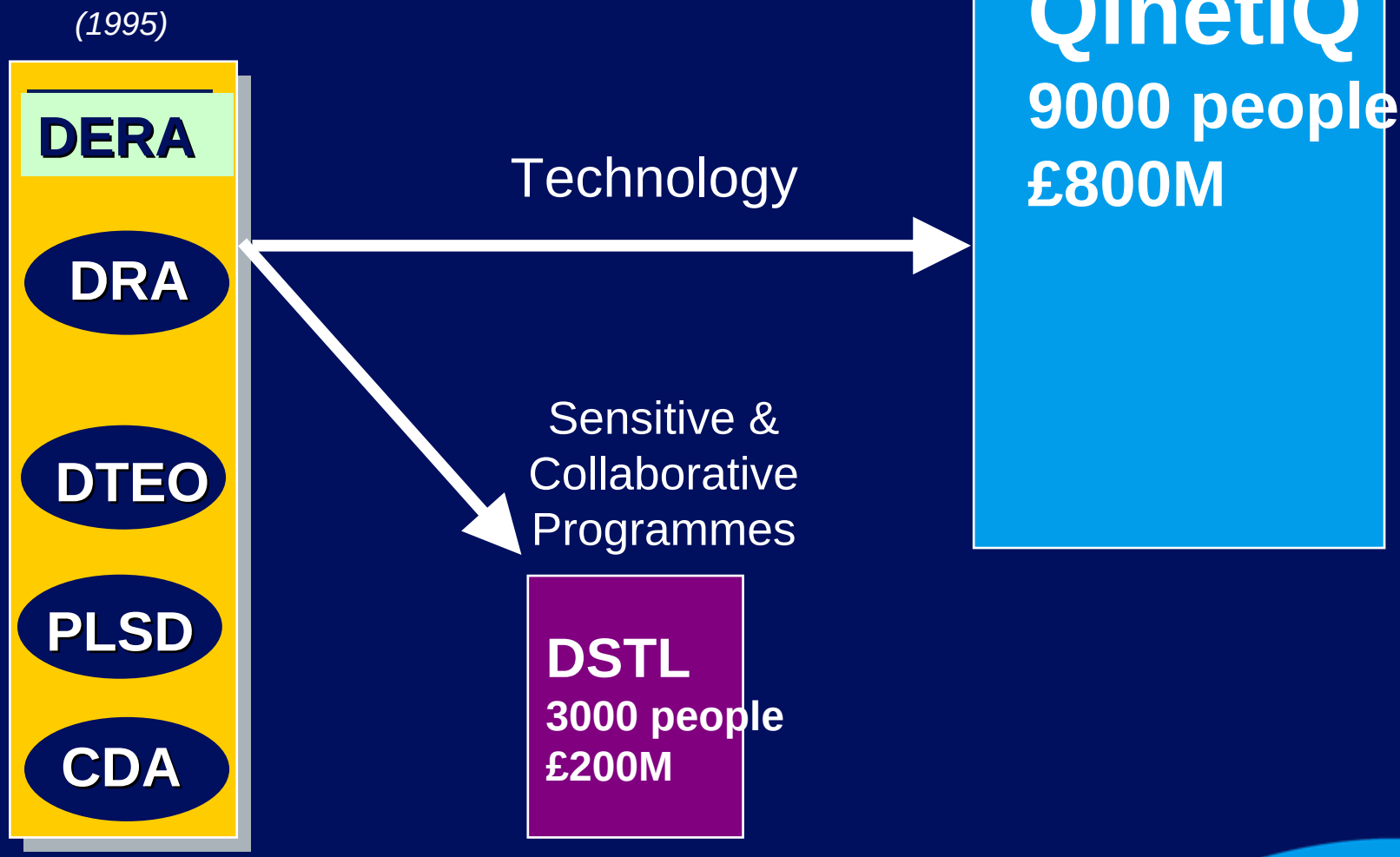
QinetiQ

Introduction to QinetiQ

The Split



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- Where have we come from?

  QinetiQ came into existence as a ‘plc’ on 1 July 2001. Prior to that, we were DERA, the UK Ministry of Defence’s elite research and development organisation.

- Ownership today

MOD	62.5%
Carlyle Group	33.8% (World’s largest equity house)
QinetiQ Employees (c. 10,000)	3.7%

- $1.6bn pa company

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QinetiQ - Key facts

- Long and distinguished history
- 10,500 employees (7,500 scientists & engineers)
- Operate globally (US office – two acquisitions 2004)
- Largest science & technology company in Europe
- 2nd largest in the world
- Collaborate with major universities around the world
- Turnover of $1.6 billion
- IPO planned during 2005/6
- Contracts ranging from $100K - $10.4 billion
- Work with some of the largest multinational companies in heath sector (medical devices; pharma; biotech)

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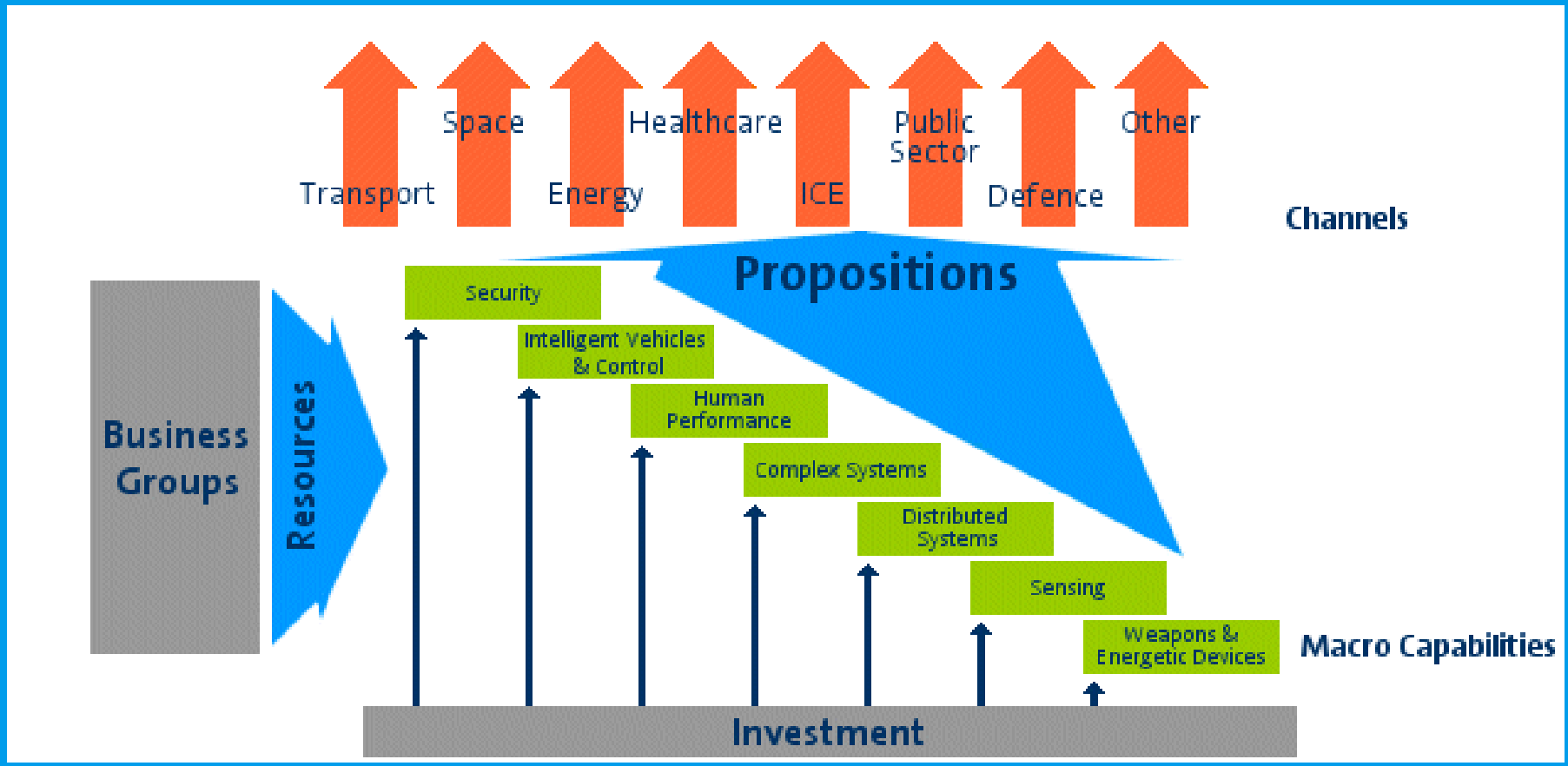
How we turn capabilities into propositions



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An unrivalled record of outstanding scientific and technological achievements

QinetiQ developed the following:

- Jet Engine
- Radar
- Carbon Fibre
- Flat panel speakers
- Liquid crystal display - ZBD Displays Ltd.
- 2020 speech
- QinetiQ Nanomaterials ltd
- QinetiQ Metal Printing

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Healthcare Managed Services

QinetiQ has outstanding breadth and depth of expertise as a managed services provider across many sectors. "*Safety before profit*" is the fundamental principle to which we adhere.

Our capabilities include:

- risk management
- logistics
- asset management and tracking
- capital investment
- technology insertion and upgrade.

Our track record is one of successfully meeting targets and milestones, delivering quality services and generating substantial cost reductions for our customers.

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A selection of key Health market achievements

Developed Products

- World first Non-invasive Fetal ECG monitoring system
- PathScore - world first automated diagnostic histopathology breast cancer system
- Ferroguard - ferrous metal detector for use in MRI suites.
- Autofocus - MRI deblurring product with the Mayo Clinic, US.

Achievements

- In 1997 QinetiQ developed the silicon microneedle, thus enabling the potential for painless drug delivery through the skin.
- DNPO chemical processes co-developed with ICI for improved nitration chemistry

Joint venture product based companies:

- PsiMedica - Biosilicon^{TM} based drug delivery system recently granted the world's first licence for human trials
- MELODI - location based metal detection system

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QinetiQ innovation in decontamination

- Refining turnaround times
- Securing supply chain efficiencies
- Statistical Process Control
- Decreased pack cool-down period
- Prioritised tracking

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Other future innovation

- Improved instrument inspection
- Automated patient record update
- Automatic instrument inspection
- E-business

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Introduction of Statistical Process Control in Decontamination

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What is Statistical Process Control (SPC)?

The application of **statistical** methods to **identify** and **control** the cause of **variation** in a process

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Where does it come from?

- 1920’s Shewhart introduces Statistical Process Control
- 1950’s Deming introduces Statistical Process Control to Japan
- 1970’s America starts to lose market share
- 1980’s “Quality Revolution” begins in America
- 1990’s Quality Programs Spread to Service Industries

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Why is SPC applicable to decontamination?

- Parameters that can impact Wash Disinfection Process
  - Wash, disinfect process quality
    - Preparation and layout of instruments
    - Length of time soiling is allowed to dry on instruments
    - Water quality
    - Water pressure
    - Water temperature
    - Dosage of disinfectant
  - Drying time
    - Air temperature
    - Air circulation

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What do we currently do?

- Monitor
  - Detergent dose
  - Conductivity of the water
  - Temperature during all stages
  - Pump pressure
- Manual comparison / sign off
- “Fail Safe” Independent monitor
- Manual inspection of wash process “Quality”
- Test on a daily & weekly basis
- Calibrate on a quarterly & annual basis

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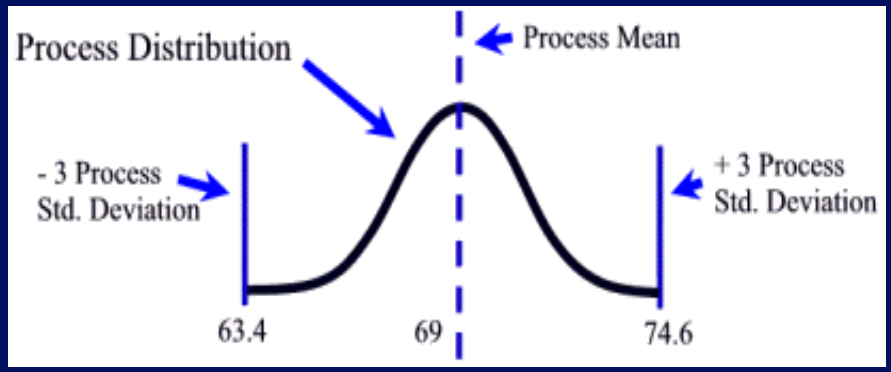
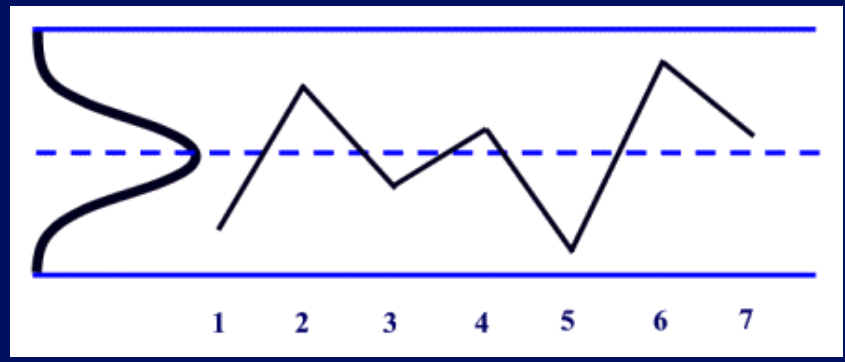
How can we apply Statistical Process Control?

- Monitor number of dirty instruments per basket
- Monitor the number of wet packs per Sterilizer Load





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Work required to introduce SPC

- Determine the measurement method
- Qualify the measurement system
- Initiate data collection & SPC charting
- Develop & document Reaction Plan
- Calculate control limits
- Assess control

Data Type	Defect Definition	Sample Size	Chart
Attribute Data - Counted as discrete events	Defect data - Number of defects, not number of defective units	Constant Sample Size	c Chart Number of Defects
		Variable Sample Size	u Chart Defects per Unit
	Defective Unit Data	Constant Sample Size, usually	np Chart Number of Defective Units
		Variable Sample Size usually ≥50	p Chart Fraction of Units Defective
Variable Data - Measured on a continuous scale		Sample Size = 1	X and R_m Moving Range
		Sample Size < 10	$\bar{X}$ and R
		Sample Size ≥ 10	$\bar{X}$ and s

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What can we gain?

- Identification of a ‘glitch’ in the process
- Early warning of a growing trend
- Quality culture
- Confidence in the process
- Reduced testing regime
- Service & maintenance only when needed
- Automatic validation of washer disinfector process

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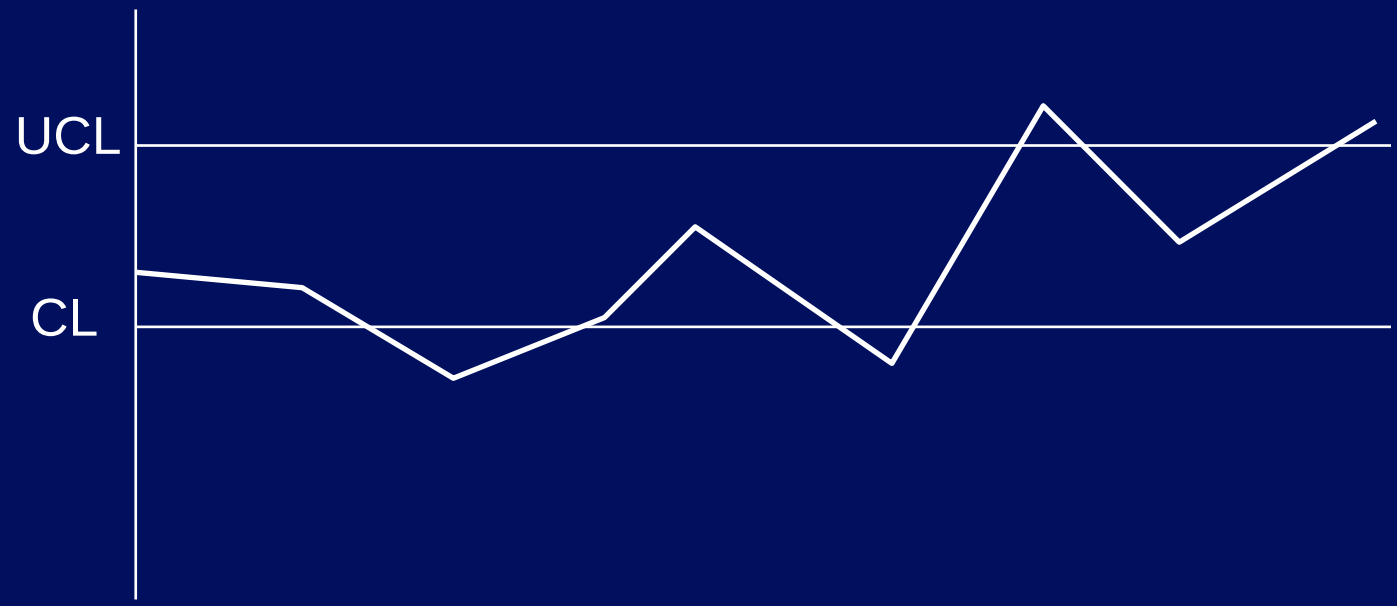
Example monitoring point



- SPC failure at Inspection point after Wash disinfection

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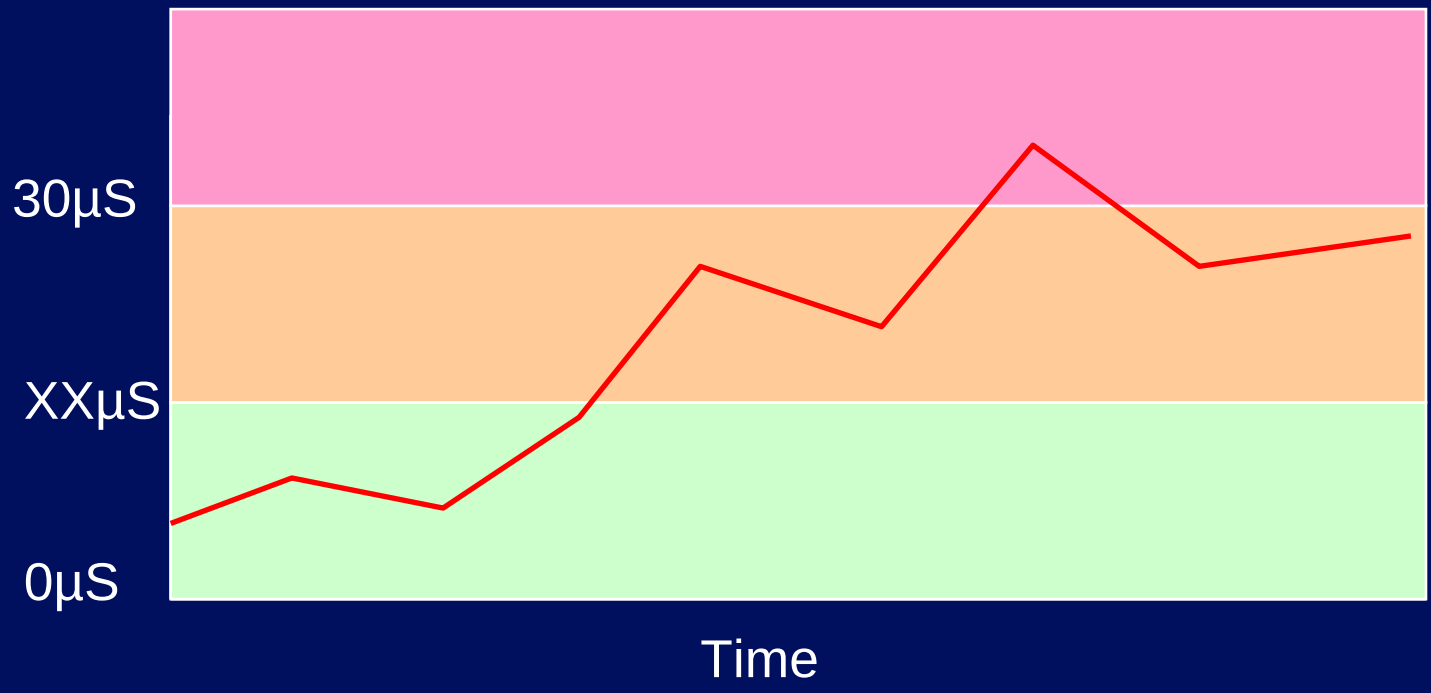
Example Monitoring Point



- HTM 2030 RO Water conductivity limit 30µS

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Work needed to see maximum benefit

- Risk analysis
- Identification of required data capture
- Parallel running of continuous monitoring with current process
- Trial using good and fault conditions
- National body acceptance

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Envisaged challenges

- Working with equipment manufacturers to:
  - Reduced validation
  - Reduced servicing
  - Reduced maintenance cost
- Potential resistance by other stakeholders due to change

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Cost of introducing innovation

- Ideas cost little
- Developing demonstrators cost a little more
- Cost benefit analysis – break point (1)
- Balancing Stakeholder expectations – break point (2)
- Re-evaluate cost benefit analysis – break point (3)
- Introducing innovation significant – break point (4)
- Recover investment – break point (5)

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Conclusion

- Small number of UK Customers
- Customers have same objective, different ways of achieving it
- Cost of innovation large
- Supply Chain needs to pull together
- Need a joined up Customer

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