SC21 Task Force

8th November 2016

Manufacturing Technology Centre (MTC), Coventry

SC21, its future programme and the competitiveness charter

Agenda

10:00	**Welcome & Introduction**	**Neil Barnett** ***Aerospace Director, ADS Group***
10:10	**SC21: Future Programme**	**Ian Bouquet-Taylor** ***Group Head of Supplier Excellence, Meggitt***
10:30	**SC21 & HVM Catapult**	**Ian Collier** ***Director of Operations, HVM Catapult***
10:45	**AS9100D Update**	**Pete Cracknell** ***Quality Assurance & Business Improvement, BAE Systems***

Agenda

11:00	**SC21 in the Midlands**	**Andrew Mair** ***Chief Executive, Midlands Aerospace Alliance***
11:15	**SC21: Case study**	**Peter Bruch** ***Managing Director and Co-Owner, AE Aerospace***
11:30	*Coffee break*	
12:00	**SC21 Award Presentation**	
13:00	*Lunch & Networking time*	
14:00	*End of the Task Force*	

10:00 Welcome & Introduction

Neil Barnett *Aerospace Director*

ADS Group

10:10 SC21: Future Programme

Ian Bouquet-Taylor *Group Head of Supplier Excellence*

Meggitt

AGP Strategy, Supply Chain Competitiveness Charter and SC21

AIRBUS BOMBARDIER the evolution of mobility BOEING GE

LEONARDO Rolls-Royce SAFRAN

SPIRIT AEROSYSTEMS THALES UTC Aerospace Systems

The UK Aerospace Supply Chain Competitiveness Charter

As a signatory to the UK aerospace supply chain competitiveness charter, we commit to:

- Promote wider participation in structured continuous improvement programmes, such as SC21 and Sharing in Growth, providing informed and ongoing guidance to assist in setting performance targets
- Provide visibility of future growth opportunities and share with appropriate candidate suppliers
- Support the focused development and dissemination of technology to radically improve product performance and manufacturing productivity
- Facilitate access to sources of support, e.g. financial institutions, HVM Catapult, research institutions, government departments
- Invest in the development of skills and apprentices in order to have the resources, capabilities and experience needed to improve productivity and meet future demand
- Build long-term relationships with globally-competitive suppliers.

We expect that our UK suppliers will:

- Engage actively in structured continuous improvement programmes, such as SC21 and Sharing in Growth, to become sustainably globally competitive
- Invest in technology to radically improve product performance and manufacturing productivity
- Invest in the development of skills and apprentices in order to have the resources, capabilities and experience needed to improve productivity and meet future demand
- Invest for growth
- Build long-term relationships with us.

Improve competitiveness of UK aerospace industry

Improving the UK Aerospace and Defence supply chain

Improving the Aerospace and Defence supply chain

SHARING IN GROWTH

Transformational programme

Competitiveness & Growth

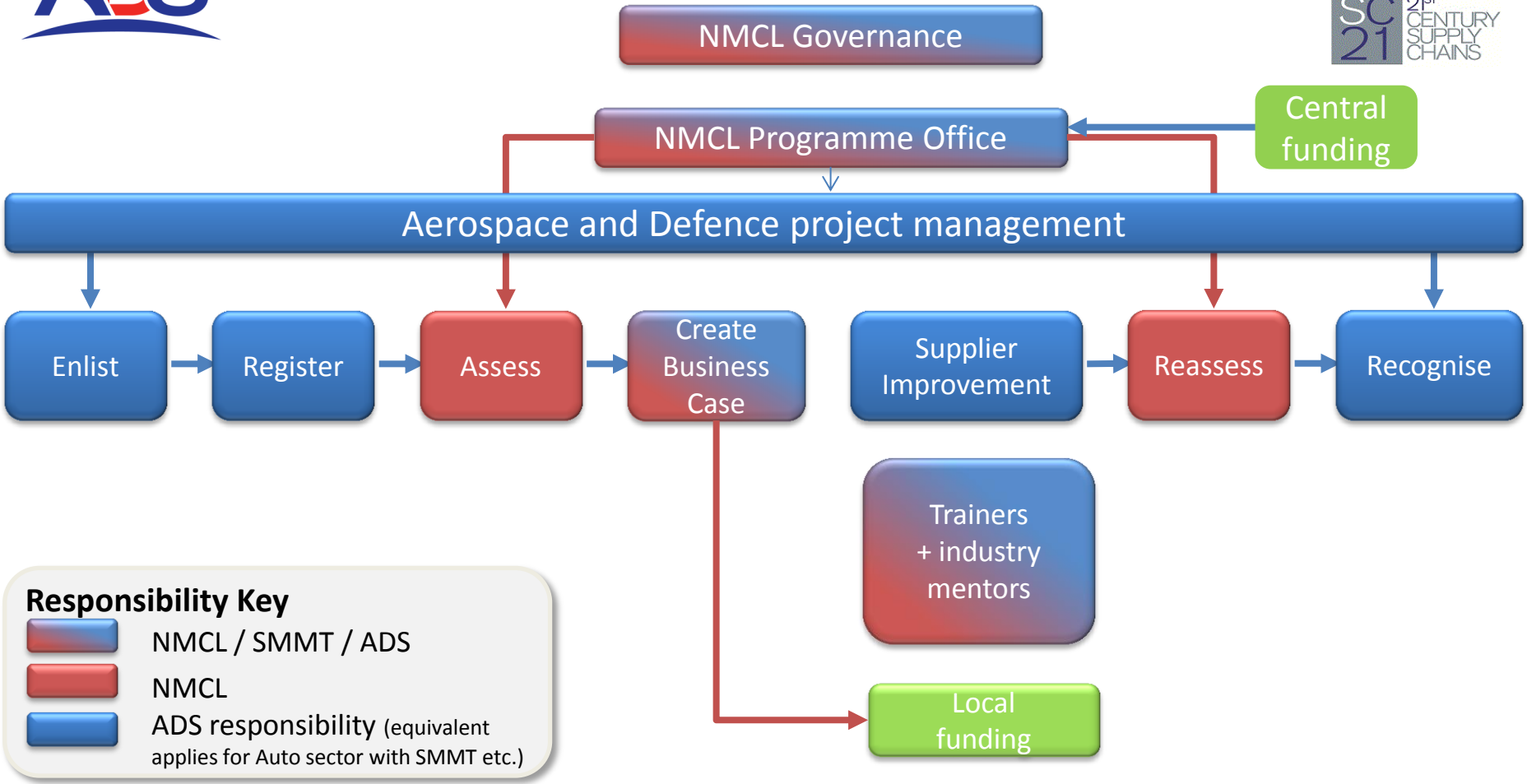
Advanced improvement programme

Operational Effectiveness

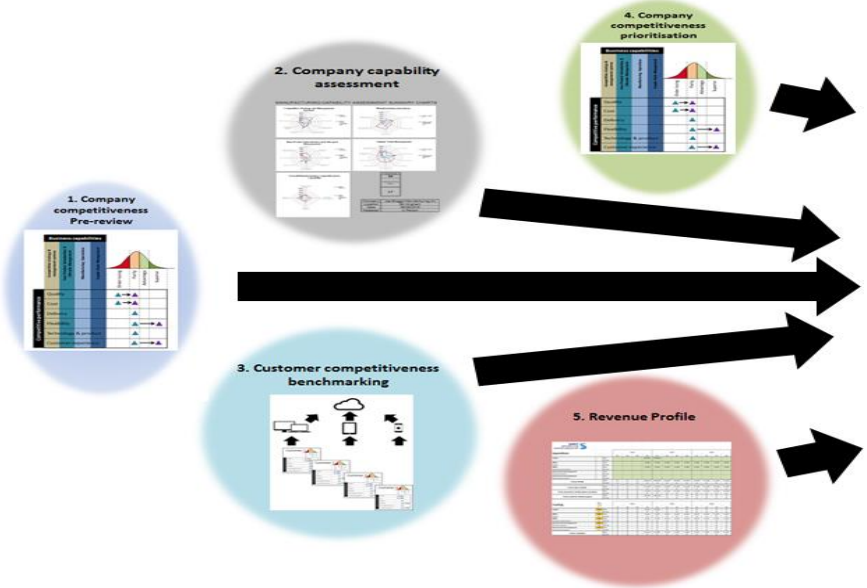
Basic improvement programme

NMCL cross-sector programme score

NMCL / SC21 C&G Structure



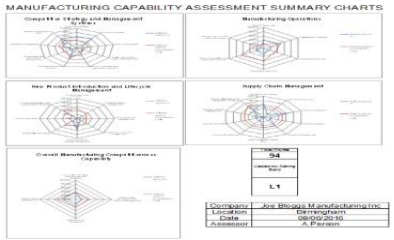
NMCL Framework – Assessment and planning

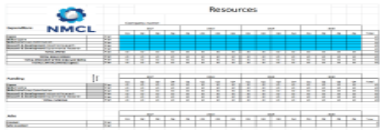


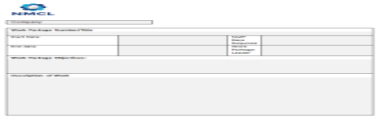
Programme Pack

Business case supported by

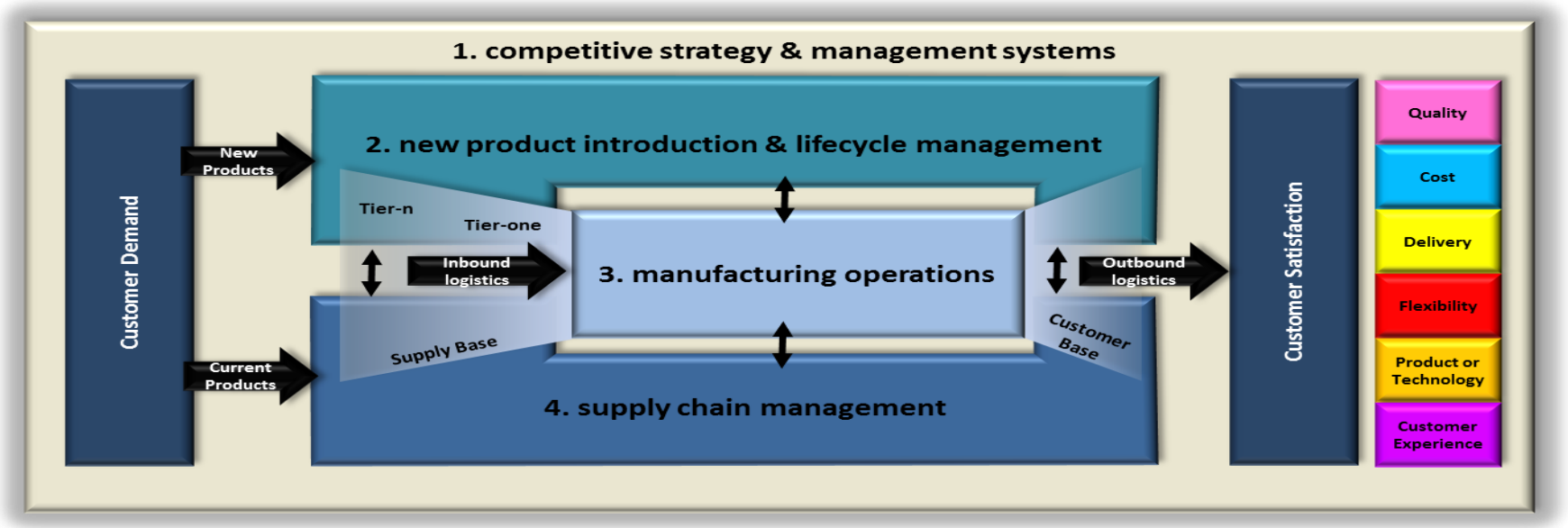
- Competitive differentiation – Order winning
- Detailed project plans – actions and timings
- KPI impact assessment
- Risk planning
- Financial impacts and assumptions
- Investment plan
- ROI, payback period, IRR or NPV (as relevant)





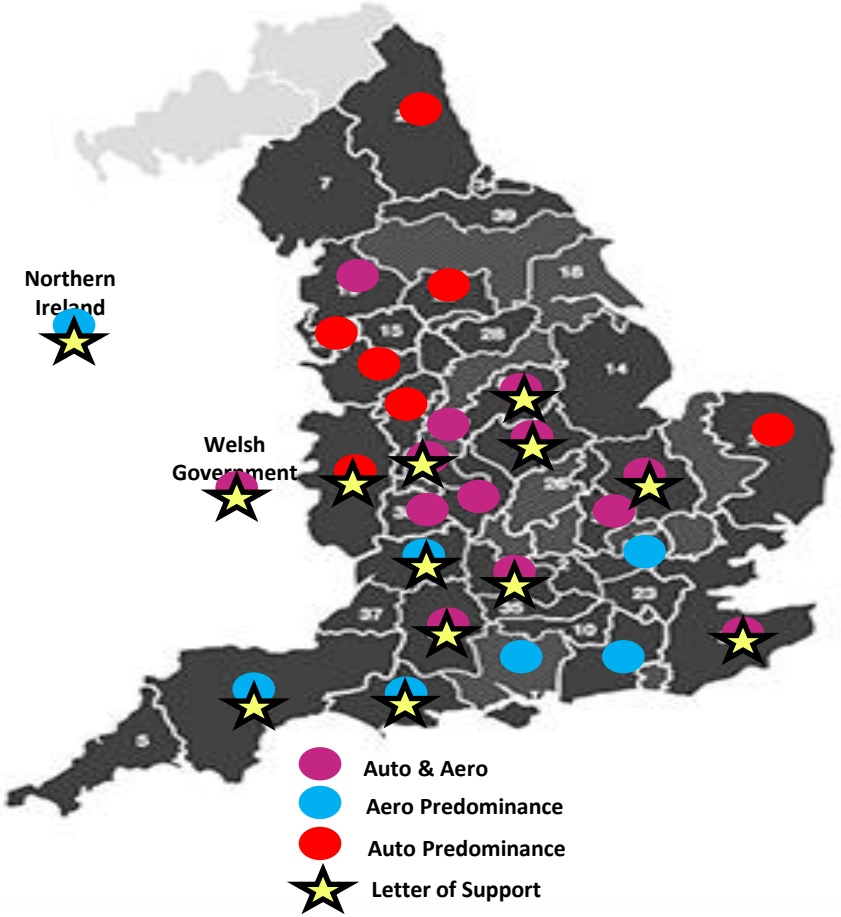


Supplier Competitiveness



Support from business

Support from Local Enterprise Partnerships & Devolved Assemblies



GREATER CAMBRIDGE GREATER PETERBOROUGH ENTERPRISE PARTNERSHIP

Enterprise Telford

heart of the south west local enterprise partnership

D2N2

black country consortium Ltd

swindonwiltshire Local Enterprise Partnership

Telford & Wrekin COUNCIL

Llywodraeth Cymru Welsh Government

Invest Northern Ireland Building Locally Competing Globally

South East Local Enterprise Partnership

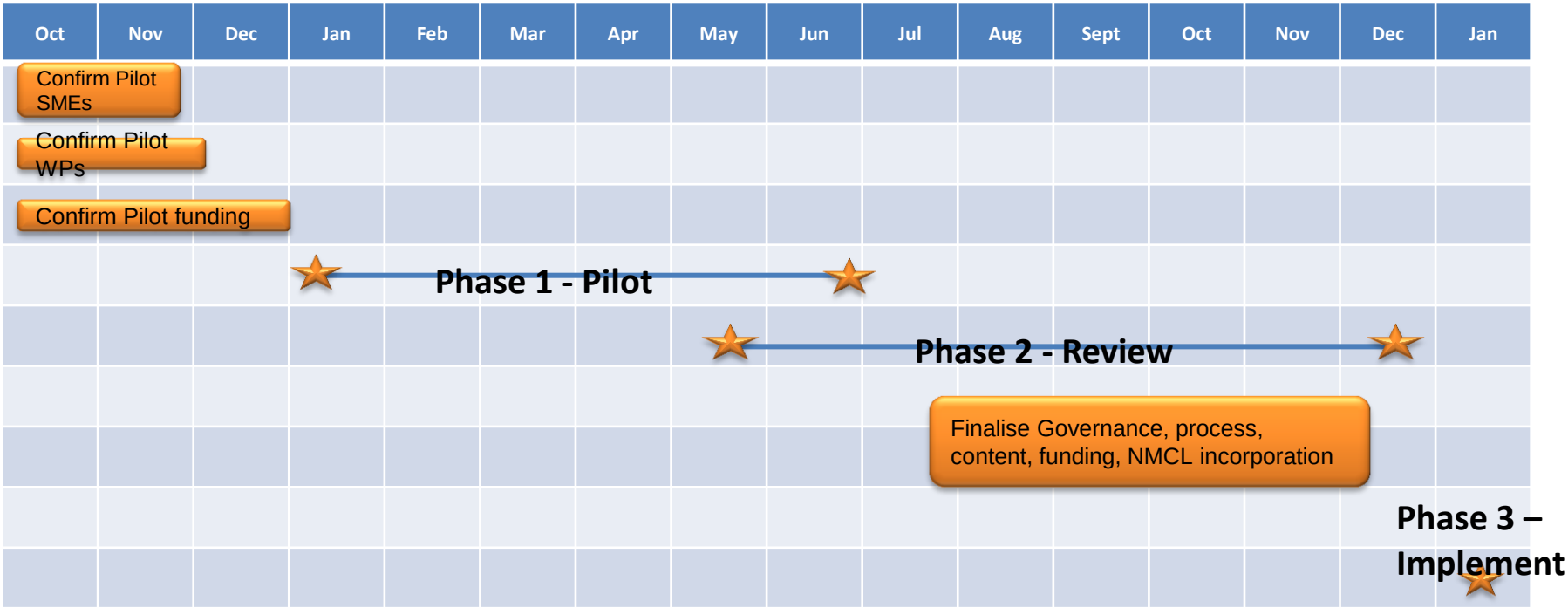
OxLEP driving economic growth

gfirst LEP growing gloucestershire

llep Leicester & Leicestershire Enterprise Partnership

Dorset EMC Engineering & Manufacturing Cluster Supporting Engineering & Manufacturing in Dorset

SC21 C&G – Programme Overview



Conclusions

Summary

1. Manufacturer centric – Needs led
2. Industry led
3. Delivering industrial strategy
4. Engages the financial sector
5. Cross sector
6. Framework longevity
7. Framework independent of funding
8. Very strong LEP support
9. Holistic quality assured provision
10. Delivering outcomes at lowest cost

Proposed next steps

1. Continue with planned pilots
2. Define impact KPIs & targets
3. Continue to develop infrastructure

http://nmluk-co-uk.sm.pp.strategiesuk.net/

Support requested from HM Government

1. £35m of public money to be match-funded by industry 50:50 (total £70m) over four years distributed through the LEPs or otherwise, with a potential year 5 & 6 extension and incremental +£8m public funding.
2. Framework funding of £8.3m over four years.
3. Encourage/incentivise all LEPs and BGHs to leverage the common NMCL approach
4. Encourage other sectors to leverage the practices and infrastructure developed by the Automotive & Aerospace industries

10:30 SC21 & HVM Catapult

Ian Collier *Director of Operations*
HVM Catapult

SC21 & HVM Catapult

Ian Collier
Operations Director
HVM Catapult

Conscious Competence - the Launch Pad for Innovation

AFRC ADVANCED FORMING RESEARCH CENTRE UNIVERSITY OF STRATHCLYDE
Advanced Manufacturing Research Centre
cpi
mtc Manufacturing Technology Centre
NATIONAL COMPOSITES CENTRE
NUCLEAR AMRC
WMG THE UNIVERSITY OF WARWICK

Customers of Suppliers: Unreasonable expectations?

CATAPULT High Value Manufacturing

What you and your customers want from suppliers: **Integrity, Delivery and Initiative**

Translated as:

- Only agree to do what you are committed to delivering
- Do what you say you're going to do when you said you'd do it
- Don't expose me to risk with out communicating in time for me to act
- Use your knowledge and expertise to our mutual benefit

As manufacturers, how will you ensure your business does these?

A Manufacturing Business – it's a system

Raw Materials and Resources → Processes → Products / Services and Wealth

INPUTS

OUTPUTS

A NETWORK OF INDEPENDENT PROCESSES THAT WORK TOGETHER TO ACHIEVE THE AIM OF THE SYSTEM

This is your business

Manufacturing – Building Competence

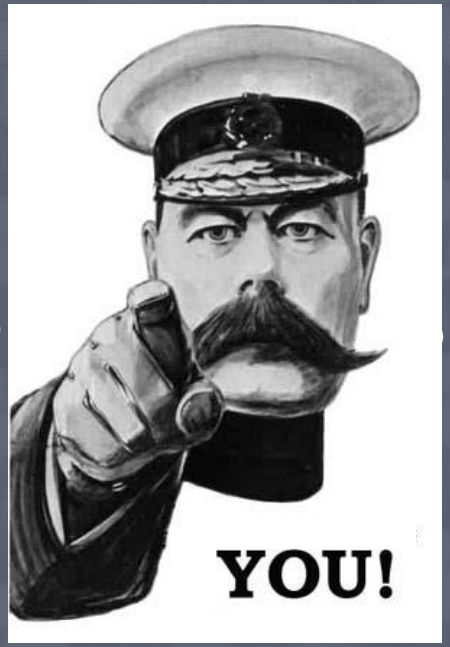
TO MAKE COMMITMENTS TO YOUR PEOPLE, TO YOUR SUPPLIERS AND YOUR CUSTOMERS YOU NEED TO BE ABLE TO PREDICT THE PERFORMANCE OF YOUR BUSINESS'S PROCESSES

CONFIDENT PREDICTIONS OF PERFORMANCE ARE ONLY POSSIBLE IF BUSINESSES PROCESSES ARE OPERATED IN:

A State of Control

This is the purpose of the Standardised Process

Manufacturing – Avoiding the freelancers

The Standardise 

iggest Enemy?

Manufacturing – Avoiding the freelancers

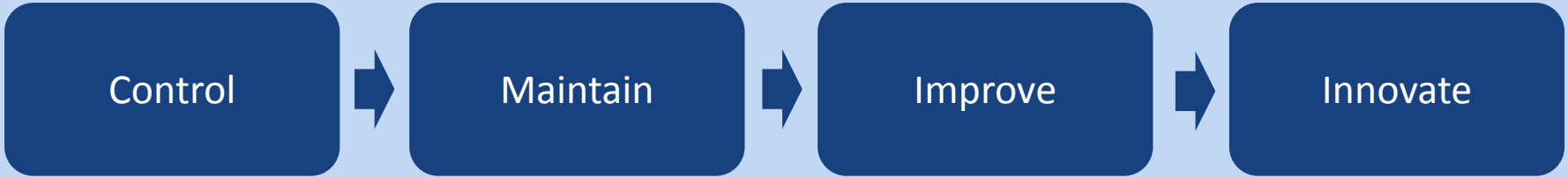
The role for people in the factory WITH a future?

To ensure th prescribed

To use their processes
and ved
BUT ONLY - or change

Manufacturing – Journey to Conscious Competence

CATAPULT High Value Manufacturing



Demise

- I know I can deliver what/when I committed
- I manage change that impacts my processes
- I will know if I or my customer are at risk

Survival

Competitiveness and Growth

- I introduce change in a controlled manner
- I can measure the impact of change
- I can determine where change adds value

SC21 – Building your Conscious Competence as the launch pad for Innovation

The Catapult network

CATAPULT
High Value Manufacturing

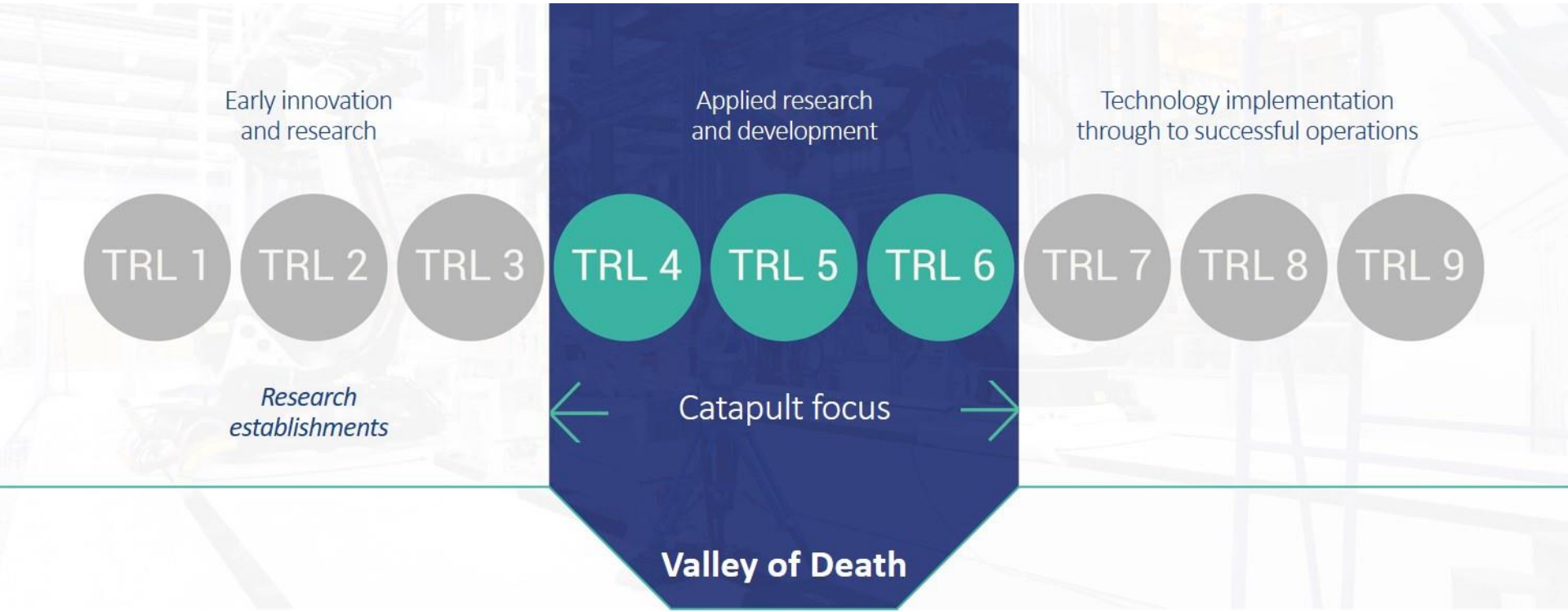
CATAPULT

- Network of technology and innovation centres
- Focus on areas where UK has inherent strengths and where market potential is significant.
- Bringing the best of the UK's innovative businesses and researchers together to bring new products and services more quickly to commercialisation.

There are currently 11 Catapults:

- Cell and Gene Therapy Catapult
- Digital Catapult
- Energy Systems Catapult
- Future Cities Catapult
- High Value Manufacturing Catapult
- Medicines Discovery Catapult
- Offshore Renewable Energy Catapult
- Precision Medicine Catapult
- Satellite Applications Catapult
- Semiconductors Applications Catapult
- Transport Systems Catapult

Catapults: Market failure – Translating ideas to reality



What the HVM Catapult does & who we help

Drive growth of manufacturing

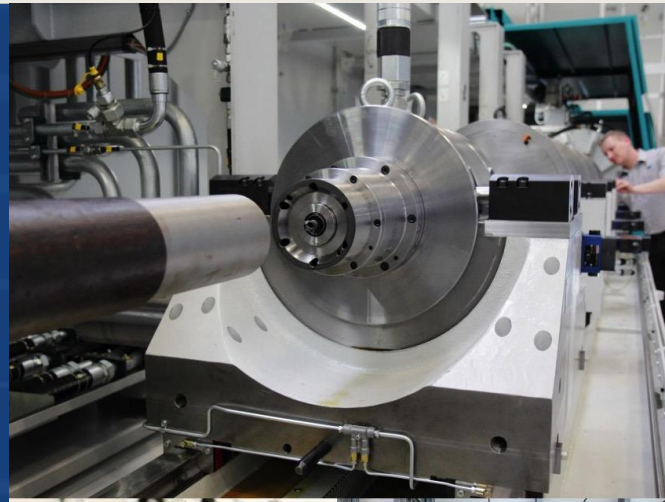
Help companies of all sizes incubate and develop new technologies to commercial reality

Helps Companies inserting current best practice technology into their operations

Take the risk out of innovation

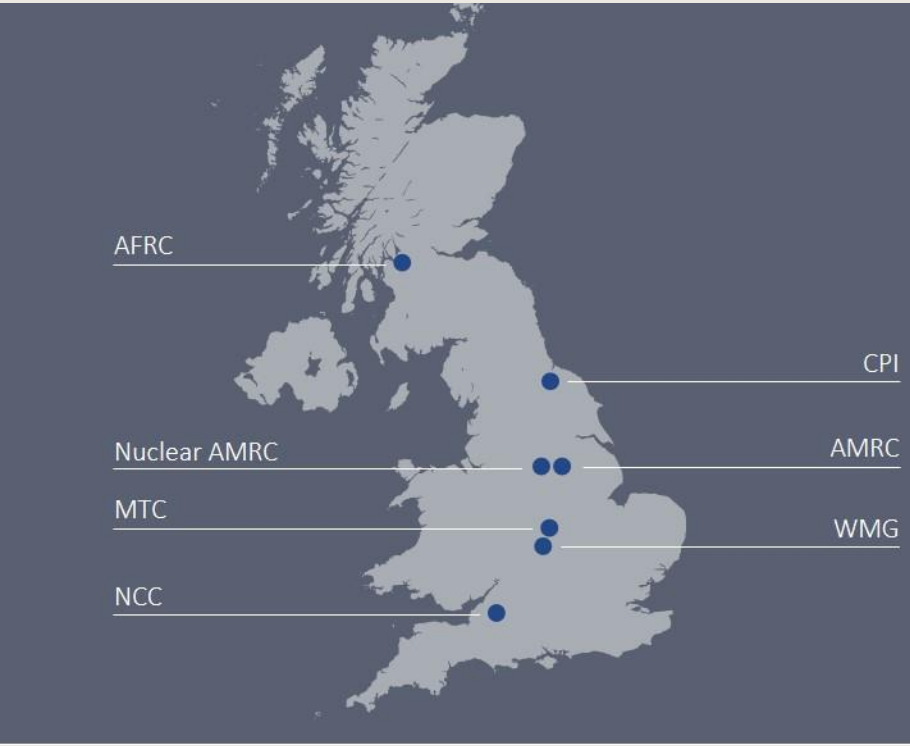
Give business access to:

- World class open source equipment
- The UK's best relevant research knowledge and expertise from 2,000+ engineers, scientists, technicians and other staff
- An environment of collaboration and open innovation
  - Cross sector
  - Cross technology
  - Whole supply chain
  - Even among direct competitors



HVM Catapult's centres

CATAPULT
High Value Manufacturing



27 technologies

CATAPULT
High Value Manufacturing


Advanced Assembly


Automation


Biologics


Biotechnology


Casting


Composites


Design


Digital Manufacturing

Electronics

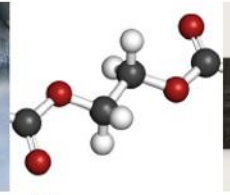

Flexible Manufacturing


Formulation


High Temperature Processing


Joining

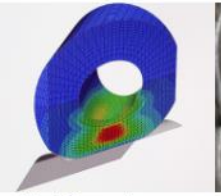

Machining


Polymers


Materials Characterisation


Metal Forming and Forging


Metrology

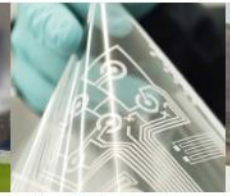

Modeling and Simulation


Netshape and Additive Manufacturing

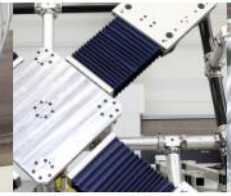

Powder Technology

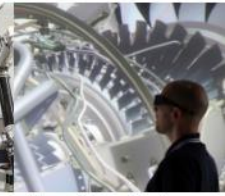

Power and Energy Storage


Resource Efficient and Sustainable Manufacturing


Printable Electronics


Surface Engineering


Toolings and Fixtures


VR and Virtualisation

Academic collaboration

CATAPULT High Value Manufacturing

University of Birmingham · University of Bristol · Loughborough University · The University of Nottingham · The University Of Sheffield. · University of Strathclyde Glasgow · The University of Warwick

7 founding universities

Heriot-Watt University · Coventry University · Prifysgol Bangor University · University of Aberdeen · University of Exeter · University of Plymouth · PML Plymouth Marine Laboratory · University of Glasgow · University of Bath · Prifysgol Aberystwyth University · University of Dundee

Kingston University London · Nottingham Trent University · Cranfield University · Oxford Brookes University · University of Surrey · University of Leeds · uclan University of Central Lancashire · Aston University Birmingham · Newcastle University · University of Kent

University of Cambridge · Glyndŵr University · Brunel University London · UWS University of the West of Scotland · Durham University · Imperial College London · Sheffield Hallam University · The Robert Gordon University Aberdeen · University of Huddersfield · University of Liverpool

Manchester The University of Manchester · University of Salford Manchester · University of Wolverhampton · City University London · University of Bolton · Cardiff Metropolitan University | Prifysgol Metropolitan Caerdydd · University of Southampton · University of Oxford · York University

GCU Glasgow Caledonian University · University of Ulster · Queen's University Belfast · The University of Edinburgh · Liverpool John Moores University · University of Lincoln · Cardiff University | Prifysgol Caerdydd · Swansea University Prifysgol Abertawe · UCL · Queen Mary University of London

57 UK universities - 24 international universities

Companies working with HVM Catapult's centres

CATAPULT
High Value Manufacturing

2015-2016 performance in numbers

CATAPULT
High Value Manufacturing

Total value of our assets

£561m

Up 16%
from 2014-15

Private sector clients

3,036

Size of order book

£187m

53%

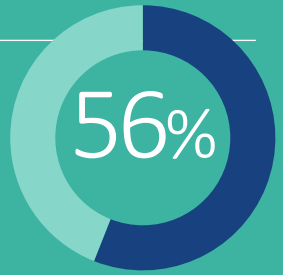
Over 53% of which came from CR&D

Number of projects

1,878

SME clients

1,701



56% of total number of private sector clients

Number of employees

1,913

Economic impact

Core funding received to June 2015

£107m

R&D Funding levered

£290m

Net benefits for the UK economy

£1.6bn

£15

net benefits to the UK economy from every

£1

core public funding received

Potential net benefits by 2020

£6.1bn

Source: WECD Economic Impact Evaluation study

Revolutionary Titanium Cutting with AMRC

Technicut

The cutting tool

- Machine time on engine components reduced from 2 min 52 sec to 5 sec
- 15% growth and employees more than double

SME achieves international success

Nikken

The tool holder

- Reduced cycle time for one part from 36 hrs to 11 hrs
- Only six milling tools now do the machining that required over 30 tools

Inward investment – new Nikken R&D centre in Rotherham

Rolls Royce

The machining

- Halved machine time and doubled productivity on engine discs

Investment & jobs with Rolls Royce's new manufacturing facility in the North East

Thank you for listening.

More resources at:
hvm.catapult.org.uk

10:45 AS9100D Update

Pete Cracknell

Quality Assurance & Business Improvement

BAE Systems

SC21 Task Force Conference

AS/EN/JISQ9100 Rev D

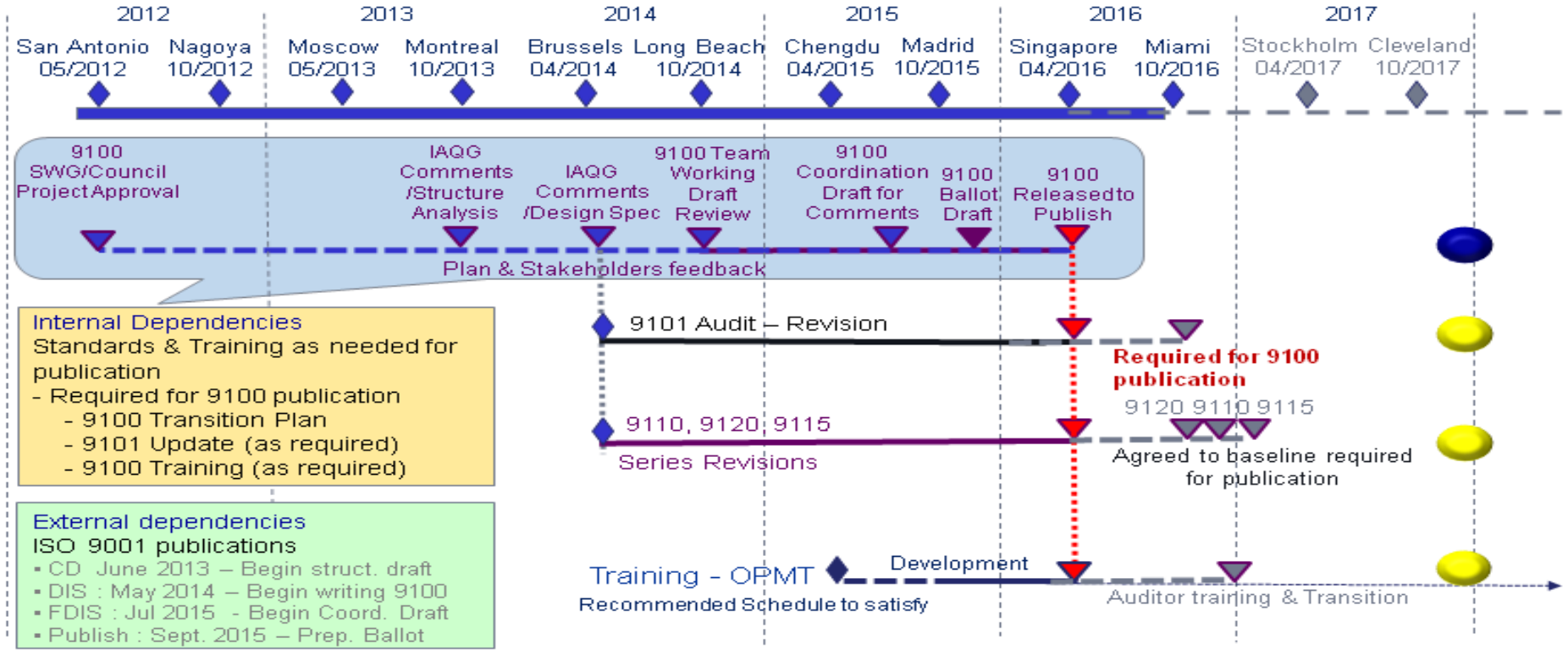
Presented By:
Pete Cracknell

9100 revision 2016
Key changes presentation

IAQG 9100 Team

June 2016

9100 revision 2016
Integrated Schedule



Target Dates	Activities
August 2016	• Publication of Supplemental Rule (SR003) Draft Version.
September 2016	• 9100 QMS standard approved for publication in all sectors.
October 2016	• 9101 QMS Audit standard, 9110 Maintenance QMS, and 9120 Distributor QMS published.
November 2016	• Mandated Aerospace Auditor "transition" training for 9100 and 9101 available in IAQG languages.
December 2016	• OASIS Next Generation project phase 1 complete. Database available for entry of transition audit results.
December 1, 2016	• Certification Bodies 9100:2016 readiness communicated to Accreditation Body • Certification Bodies provide documentation to certified organizations regarding transition requirements and transition process.
January 2017	• Mandated Aerospace Auditor "transition" training for 9110 and 9120 modules available in IAQG languages.
March 1, 2017	• Certified organizations provide intention to transition to the 2016 revision to their Certification Bodies.
June 2017	• All future audits must be to the 9100/9110/9120:2016 standard using 9101:2016 audit process.
September 2018	• Transition complete all 9100/9110/9120:2009 certificates are no longer valid.

9100 PUBLISHED

SAE: Published 20 Sep 16 as AS9100D

ASD-STAN: Published 3 Oct 16 as prEN9100 P4 (estimated EN publication by mid-2017)

SJAC: Published 20 Sep 16 as JIS Q 9100 revision 2016

Estimated 9101 sector formatting for publication completion dates are:

SAE: Published 31 Oct 16

ASD-STAN: 28 Jul 16

SJAC: 7 Sep 16

Estimated publication 7 Oct 16

Estimated 9110 sector formatting for publication completion dates are:

SAE: 14 Jul 16

ASD-STAN: 13 Sep 16

SJAC: TBA

Estimated publication 24 Oct 16

Estimated 9115 sector formatting for publication completion dates are:
SAE Affirmation Ballot in process

SAE: TBD

ASD-STAN: TBD

SJAC: TBD

Estimated publication 29 Dec 16

Estimated 9120 sector formatting for publication completion dates are:

SAE: Published 1 Nov 16

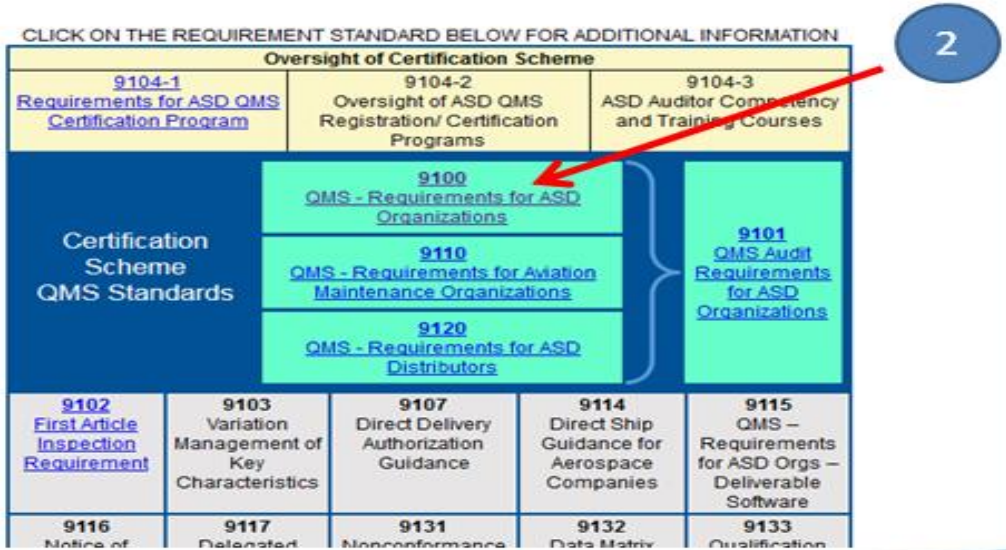
ASD-STAN: 13 Sep 16

SJAC: 15 Nov 16

Estimated publication 24 Oct 16

Path through the IAQG web site

www.iaqg.org



Support Material

Tools for review and implementation

*Correlation **Matrix** (before & after)*

9100:2016 to 9100:2009

Correlation Matrix

9100:2016		9100:2009
Context of the organization	1.0	**Scope**
Understanding the organization and its context	1.1	General
Understanding the needs and expectations of interested parties	1.1	General
Determining the scope of the quality management system	1.2	Application
	4.2.2	Quality manual
Quality management system and its processes	4	Quality management system
	4.1	General
Leadership	5	**Management responsibility**
Leadership and commitment	5.1	Management commitment
Customer focus	5.2	Customer focus
Quality policy	5.3	Quality policy
5.1 Developing the Quality Policy	5.3	Quality policy
5.2 Communicating the Quality Policy	5.3	Quality policy
Organizational roles, responsibilities and authorities	5.5.1	Responsibility and authority
	5.5.2	Management representative
	5.4.2	Quality management system planning
Planning		
Actions to address risks and opportunities	5.4.2	Quality management system planning
	8.5.3	Preventive action
Quality objectives and planning to achieve them	5.4.1	Quality objectives
Planning of changes	5.4.2	Quality management system planning
Support	6	**Resource management**
Resources	6	Resource management
7.1 General	6.1	Provision of resources
7.2 People	6.1	Provision of resources
7.3 Infrastructure	6.3	Infrastructure
7.4 Environment for the operation of processes	6.4	Work environment
7.5 Monitoring and measuring resources	7.6	Control of monitoring and measuring equipment
7.5.1 General	7.6	Control of monitoring and measuring

9100 Series Key Changes & Clause-by-Clause Review

- ***Process Approach***
- *Risk-based Thinking/ Management*
- ***Counterfeit Product***
- *Product Safety*

Frequently Asked Questions

9100:2016

Frequently Asked Questions (FAQs)

May, 2015

1. Questions about the change

1. Why has it been decided to issue a new version of 9100?

Business needs and the needs and expectation of other interested parties have changed significantly since the last major revision of ISO 9001 in the year 2000. Examples of these changes are ever more demanding customers, the emergence of new technologies, increasingly more complex supply chains and a much greater awareness of the need for sustainable development initiatives.

2. Does 9100 still apply to all organizations - big, small, different sectors and different items – products, services?

The concept of the standard has not changed: it's applicable to any type of organization, regardless of the size, type or its core business.

3. Has the structure of the standard been substantially changed?

Yes, the structure has been changed to align with the common 10 clause high level structure developed by ISO to ensure greater harmonization among its many different management system standards. The new revision to ISO 14001 will also adopt this same structure, which is built around the PDCA (Plan-Do-Check-Act) sequence. This will make it easier for organizations to address the requirements of more than one ISO Management System Standard within a single, integrated system.

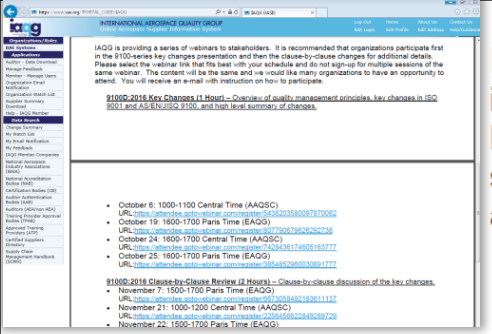
4. What are the structural differences between the old and new version?

- A new additional clause 4 now addresses the "Context of the Organization"
- The old clause 5 of 9100:2009 is now separated into clause 5 Leadership and clause 6 Planning and has more content in each clause
- The Measurement, Analysis and Improvement clause 8 of 9100:2009 is now separated into clause 9 Performance Evaluation and clause 10 Improvement
- These changes are addressed in detail in the 9100:2009 to 9001:2015 Correlation Matrix (link)

5. What are the main differences in content between the old and new version?

There is more flexibility regarding documentation, but with a greater emphasis on the organization being able to manage its processes in order to provide consistent conforming products and services. The application of the standard to service organizations is emphasized, as well as those making tangible product; there are more stringent requirements for leadership, by top management; the term preventive action is replaced by the concept of risk-based thinking that permeates

And more…



IAQG is providing a series of webinars to stakeholders. It is recommended that organizations participate first in the 9100-series key changes presentation and then the clause-by-clause changes for additional details. Please select the webinar link that fits best with your schedule and do not sign-up for multiple sessions of the same webinar. The content will be the same and we would like many organizations to have an opportunity to attend. You will receive an e-mail with instruction on how to participate.

9100D:2016 Key Changes (1 Hour) – Overview of quality management principles, key changes in ISO 9001 and AS/EN/JISQ 9100, and high level summary of changes.

URL:https://attendee.gotowebinar.com/register/5438203580097870082

- October 19: 1600-1700 Paris Time (EAQG)
  URL:https://attendee.gotowebinar.com/register/807790679626292738
- October 24: 1600-1700 Central Time (AAQSC)
  URL:https://attendee.gotowebinar.com/register/7428436174605163777
- October 25: 1600-1700 Paris Time (EAQG)
  URL:https://attendee.gotowebinar.com/register/3854852960030891777

9100D:2016 Clause-by-Clause Review (2 Hours) – Clause-by-clause discussion of the key changes.

- November 7: 1500-1700 Paris Time (EAQG)
  URL:https://attendee.gotowebinar.com/register/6673058492183611137
- November 21: 1000-1200 Central Time (AAQSC)
  URL:https://attendee.gotowebinar.com/register/2256456622849289729
- November 22: 1500-1700 Paris Time (EAQG)
  URL:https://attendee.gotowebinar.com/register/5221872468310041857
- December 19: 0900-1100 Central Time (AAQSC)
  URL:https://attendee.gotowebinar.com/register/7207930217166514945

9100 Revision 2016

Key changes
in the 9100 additions

May 2016

9100 revision 2016

9100 Series Changes - High Level Summary

No Requirements

Clause 1 Scope	▪New process model ▪Added a PDCA model ▪Added "Risk-based thinking" ▪Emphasis on defining the QMS and context of the organization
Clause 2 Normative ref	▪ISO 9000:2015 referenced
Clause 3 Terms and definitions	▪ISO 9001 terms and definitions moved to ISO 9000 ▪ *Added 9100 "product safety", "counterfeit part"*
Clause 4 Context of the organization	▪Maintained documented information is required, *can be named Quality Manual* ▪Justified exclusions not limited to Realization/Operations processes ▪QMS processes have performance indicators
Clause 5 Leadership	▪QMS compatible with strategic direction ▪QMS requirements integrated into business processes ▪Processes deliver their intended outputs
Clause 6 Planning for the QMS	▪When planning the QMS, determine the actions needed to address opportunities and risks (prevention) ▪Increases requirements for planning of changes
Clause 7 Support	▪Determine knowledge management requirements ▪ *Awareness on product conformity, product safety, ethical behavior*
Clause 8 Operation	▪ *Planning for product obsolescence* ▪ *Plan activities needed to assure product safety* ▪ *Prevention of counterfeit parts* ▪ *Process to validate test reports for raw material based on risks* ▪Release of products and services
Clause 9 Performance evaluation	▪Assess performance of QMS processes ▪ *Added Note to evaluate performance indicators on internal audits*
Clause 10 Improvement	▪ *Consider human factors in nonconformity / corrective action*

All ISO MS standards will now have this common 10 clause structure

Key Changes *(in the AS&D requirements)*

As a consequence of the new ISO 9001 structure:

- 9100 additions have been **relocated** into appropriate ISO sections
- the requirements are better **organized** and **clarified**, with notes and examples to enhance understanding

9100 revision 2016

Key Changes *(in the AS&D requirements)*

- **Product safety**
  added in a separate clause and in selected areas
- **Counterfeit parts prevention**
  added in a separate clause and in selected areas
- **Risk**
  merged current 9100 requirements with the new ISO requirements and emphasis on risks in operational processes
- **Awareness**
  reinforced requirements for awareness of individual contribution to quality
- **Human factors**
  included as a consideration in nonconformity / corrective action
- **Configuration management**
  clarified and improved to address stakeholder needs

9100 Revision 2016

Product safety

9100 revision 2016
Product Safety

Addition

- New clause (8.1.3) on Product Safety, including requirements to address product safety considerations throughout the product lifecycle (use the NOTE as guidance) *+ revision for consistency of other clauses related to safety – 7.3, 8.1, 8.4.3 & 8.5.4*
- A full Safety Management System (SMS) as defined by ICAO (International Civil Aviation Organization) is not required by 9100, but the introduction of this new clause contributes to the SMS approach

Rationale

- Industry acknowledgement of the importance of increasing safety
- Recognition of the 9100 certifications by authorities is part of IAQG strategy

Definition

- "The state in which a product is able to perform to its designed or intended purpose without causing unacceptable risk of harm to persons or damage to property"

Examples of activities to consider:

- **Assessment of hazards and mitigation of associated risks:**
  - ✓ Implement FMEA relating to product (DFMEA) and process (PFMEA)
  - ✓ Perform safety analysis
  - ✓ Identify and mitigate risks relating to the organization and its personnel (human factors, management of responsibilities)
- **Management of safety critical items:**
  - ✓ Define and implement a monitoring control plan for critical items identified through FMEA and safety analysis

Examples of activities to consider (cont.)

- **Analysis and reporting of occurred events affecting safety:**
  - ✓ Organize the collection of potential and occurred events, and analyze their impacts with specialists
  - ✓ Organize the internal escalation process and external reporting to interested parties
  - ✓ Analyze the adverse trends of products in service reliability and define appropriate actions

- **Communication of these events and training of personnel:**
  - ✓ Promote safety culture and lessons learned from occurred events (impacts of the parts delivered by the organization on the final product safety)
  - ✓ Prevent occurrence of safety issues by taking into account industry experience (including occurrences on other products with similar functions or based on same technologies or components)

9100 Revision 2016

Prevention of counterfeit parts

9100 revision 2016

Counterfeit parts prevention

Addition

- New clause (8.1.4) including requirements for prevention of counterfeit parts and a note giving examples of the associated processes
  + revision of affected clauses: 8.4.2 ; 8.4.3 (external provisions) & 8.7 (nonconformities)

Rationale

- Mitigate effects of growing threat of counterfeit / fraudulent product
- Recognize the emerging counterfeit/fraudulent statutory/regulatory requirements on QMS processes

Definition

- "An unauthorized copy, imitation, substitute, or modified part (e.g., material, part, component), which is knowingly misrepresented as a specified genuine part of an original or authorized manufacturer.

  NOTE: Examples of a counterfeit part can include, but are not limited to, the false identification of marking or labeling, grade, serial number, date code, documentation, or performance characteristics."

9100 revision 2016

Counterfeit parts prevention

Processes to consider:

- **Training** in the awareness and prevention of counterfeit parts
  - ✓ Procurement personnel in trusted source selection and requirements
  - ✓ Inspection personnel for prevention of counterfeit items (visual/test)
  - ✓ Design personnel in obsolescence management
- **Obsolescence monitoring** → design decisions and parts selections to be appropriate for service life of product
- **Controls for acquiring parts** → from original manufacturers, authorized distributors, or other approved sources
- **Assuring traceability** of parts and components to their original manufacturers :
  - ✓ Original Equipment Manufacturer (OEM) or
  - ✓ Authorized manufacturer (e.g., in case of PMA, direct delivery authorizations)

9100 revision 2016

Counterfeit parts prevention

Processes to consider:

- **Verification and test methodologies** to detect counterfeit parts:
  - ✓ Parts identification or marking
  - ✓ Tests or chemical analysis
- **Counterfeit parts reporting**
  - ✓ Monitoring reporting from external sources (access to databases, information letters from OEMs)
  - ✓ Quarantine and reporting of internal incidences in appropriate government and industry reporting systems (determine the responsibilities in the escalation process, the process to follow to report to authorities / customers)

Requirement regarding non conformance control:

- ✓ Segregate and control suspected or known counterfeit products
- ✓ Ensure these products are not re-introduced into the supply chain

9100 Revision 2016

Risk management

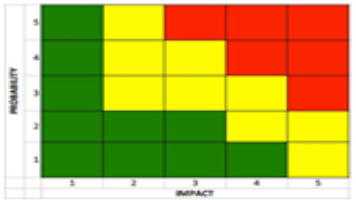
9100 revision 2016
Risk management

Clause 6.1 is related to risks in "QMS of the organization":

- Manage risks at organization / processes level
  (such as: new customers, new market, company partnerships, business localizations, …)

Clause 8.1.1 is related to the risks in "Operational Processes" defined in clause 8:

- Implement a formal process to manage risks
- Adapt the process to the organization and the product
  (e.g. quantitative requirements and probabilistic risk analysis may be required in some cases ; determine people involved in this activity)
- Deploy the risks analysis within the operation activities
  (such as : contract review and signature, new technologies introduction, external providers selection, …)



9100 Revision 2016

Awareness

9100 revision 2016

Awareness

- The 9100:2016 requires the employees aware of:
  - ✓ their contribution to product or service conformity
  - ✓ their contribution to product safety,
  - ✓ the importance of ethical behavior
- **Awareness activities** can be performed in different ways:
  - direct communication of expectations between managers and employees
  - communication campaigns on dedicated topics, e.g., posters, pamphlets, fliers, newsletters, videos
  - identification of focals with responsibility for communication and promotion,
  - formal training
- **What is expected:**
  - individuals should be able to explain their own role, how they contribute to quality,
  - quality basics (follow instructions, report events, maintain records …),
  - individuals know the use of the products and potential impact of failures

9100 revision 2016

Awareness

- Organizations should make their own determination of what is important to communicate to their employees in regard to ethics
- Below are some items for considerations
  - ✓ Establishing a culture where employees understand their responsibilities
  - ✓ Managers listening to employees and effectively recognizing their work (in addition it can help boost productivity)
  - ✓ Reporting and not passing on defects or non conformances (e.g., line stoppage as appropriate, recalling delivered non conforming product, ..)
  - ✓ A culture allowing unethical behavior can breed all manner of damaging and even criminal activity
  - ✓ Respect the laws, regulations, internal rules, regarding e.g. : conflict of interests, export compliance regulations, intellectual property agreements, acceptance or proposals of gifts, invitations or favors with customers and suppliers

9100 Revision 2016

Human Factors

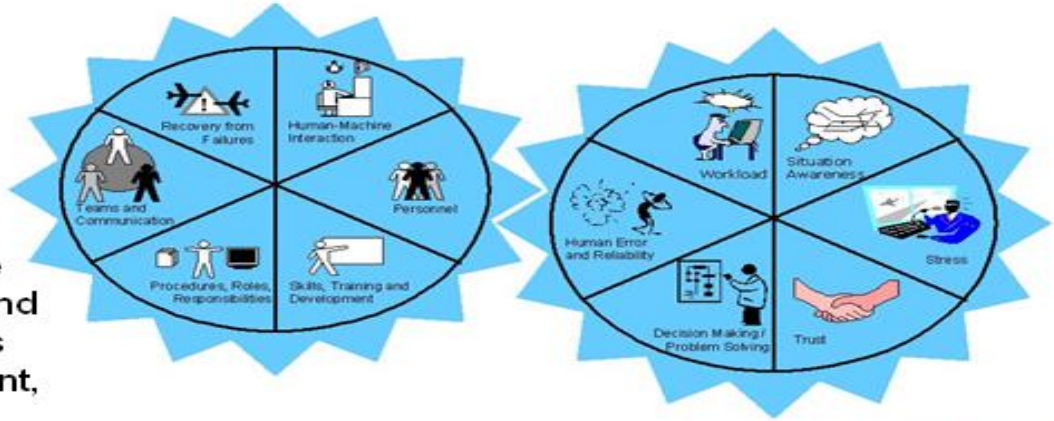
9100 revision 2016
Human Factors

Addition

- Requirement to include the human factors considerations in the root causes analysis of nonconformities

Definition

- The understanding of the interactions between people, machines and each other and their impact on human performance.
- Example: Recognition that persons performing tasks are affected by physical fitness, physiological characteristics, personality, stress, fatigue, distraction, communication and attitude in order to ensure a safe interface between the persons and all other environmental elements such as other persons, equipment, facilities, procedures and data.



Rationale

- To reinforce the controls linked to clause 7.1.4 (environment for the operation of processes) and clause 8.5.1. g (prevention of human errors)
- Recognize the importance of human factors in the origin of nonconformities

Implementation considerations

- Determine the human factors to be considered according to the products, workplaces, equipment and people of the organization
- Include the elements to be reviewed during the root causes analysis of nonconformities
- Capitalize with lessons learned on occurred human errors

Questions

11:00 SC21 in the Midlands

Andrew Mair

Chief Executive

Midlands Aerospace Alliance (MAA)

Midlands aerospace cluster
Midlands Aerospace Alliance
SC21 regional perspective

Dr. Andrew Mair
Chief Executive
Midlands Aerospace Alliance

midlands aerospace alliance

The Midlands

Population: 10m

Region well known for automotive industry

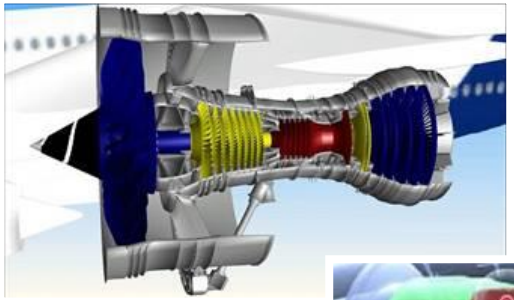
Also one of the world's largest aerospace clusters

- Business turnover $6bn+
- >75% civil aircraft markets
- 90% of production exported
- 45,000 FTE employees (plus airports and military bases)

Important part of UK aerospace industry (c. 25% national production -- and c. 3% of world production).

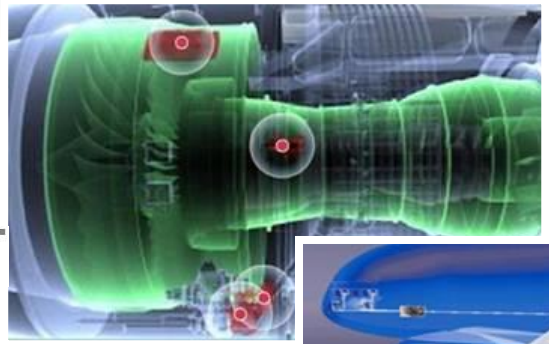
midlands aerospace alliance

Midlands aerospace systems: “guts” of the aircraft



gas turbine engines

ROLLS ROYCE



ROLLS ROYCE MEGGITT

control systems for engines

aircraft wing controls

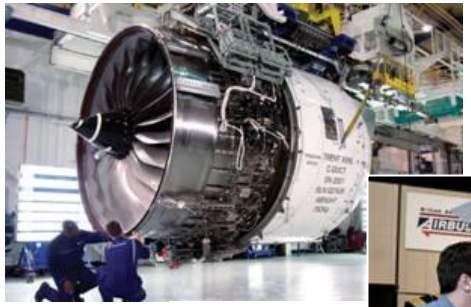
midlands aerospace alliance

UTC Aerospace Systems

MOOG

Four technology competencies of Midlands aerospace cluster

- propulsion systems
  - gas turbine and other technologies
- control systems for aircraft and engines
  - mechanical
  - pneumatic
  - hydraulic
  - electrical
  - electronic
- metals, alloys and composite materials for these systems
- tools, gauges, test equipment, engineering and design services

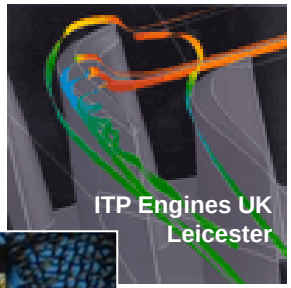


Rolls-Royce Derby

UTAS Actuation Systems Wolverhampton

Electro Discharge Dudley

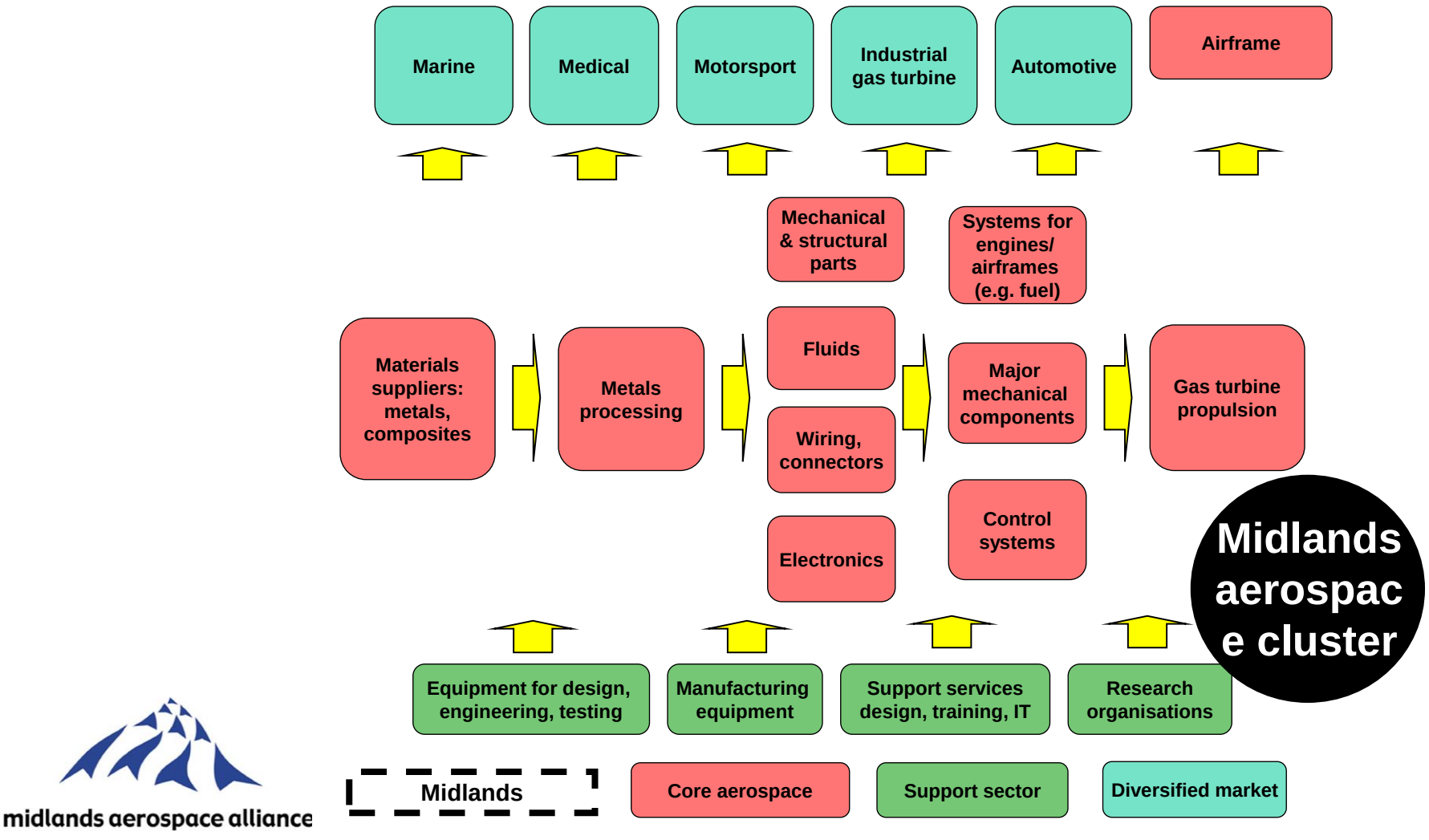
Winbro, Leicestershire



ITP Engines UK Leicester

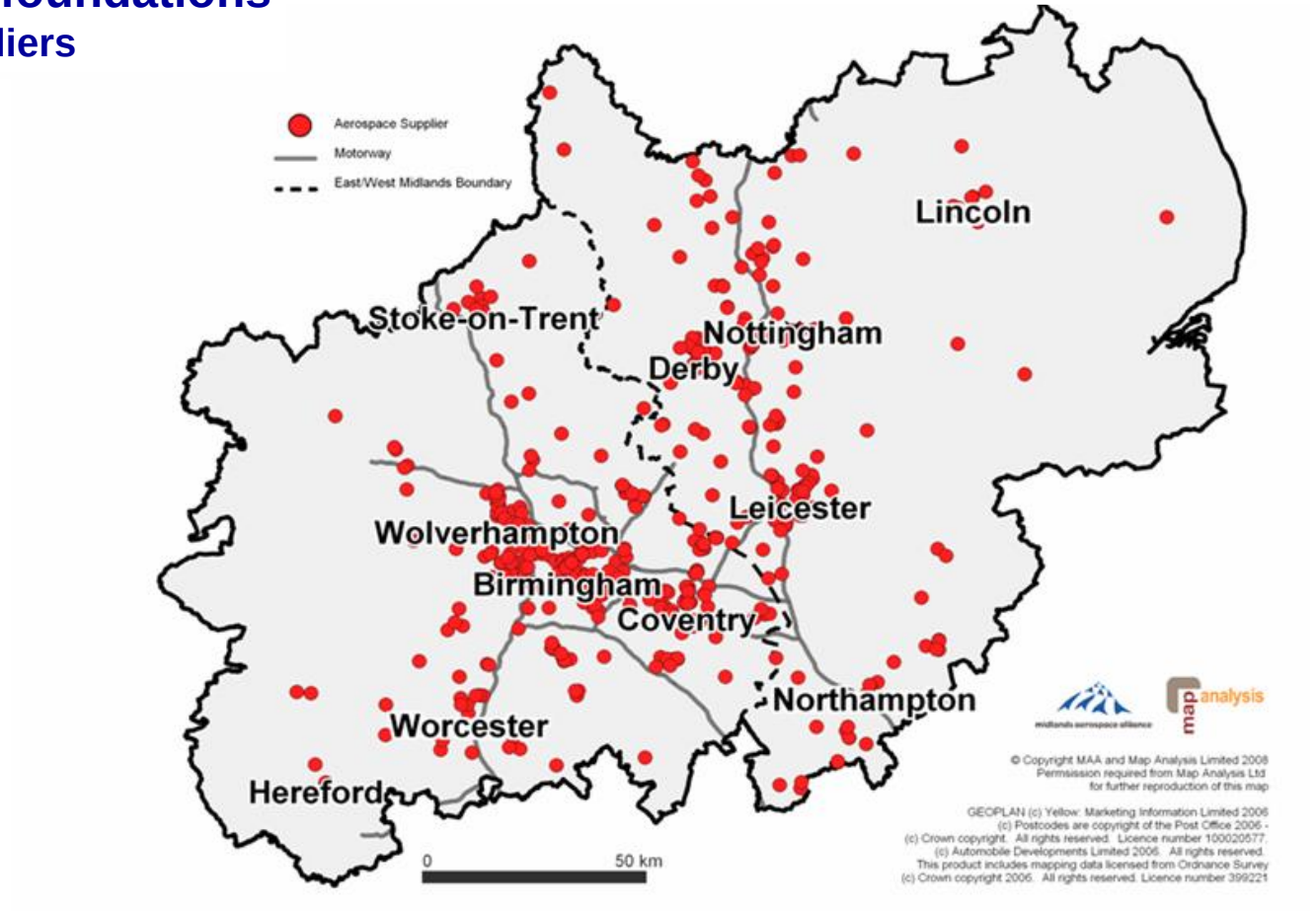
Special Metals Wiggin, Hereford

midlands aerospace alliance

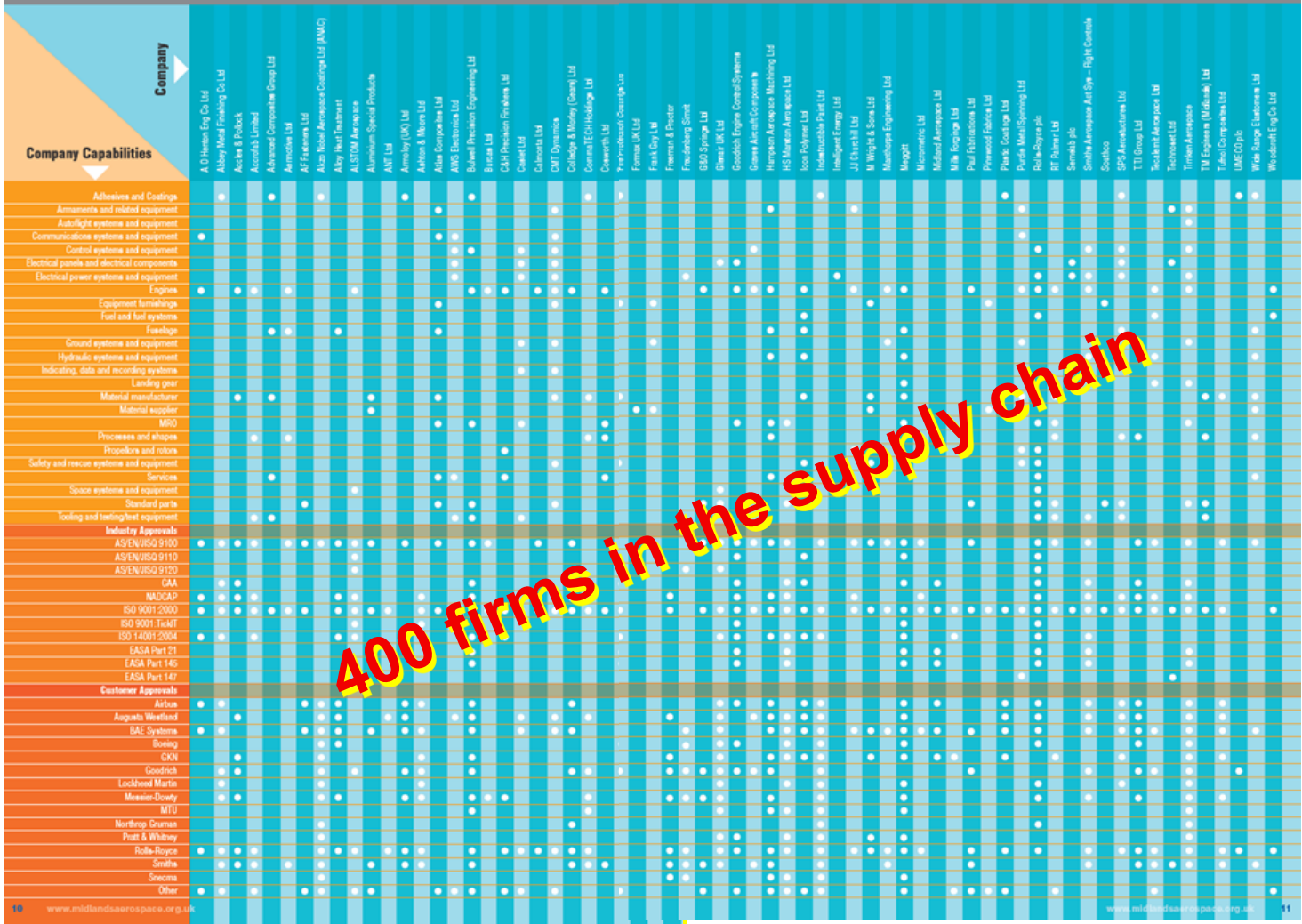


midlands aerospace alliance

Cluster foundations
400 suppliers



midlands aerospace alliance



midlands aerospace alliance

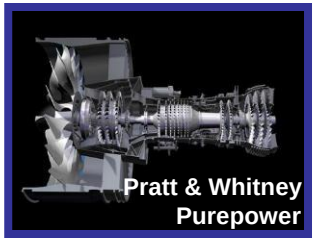
Aircraft and engines driving Midlands cluster performance

Boeing 787/ Rolls-Royce Trent 1000

Airbus A350/ Rolls-Royce Trent XWB


Eurofighter Typhoon/ EJ200

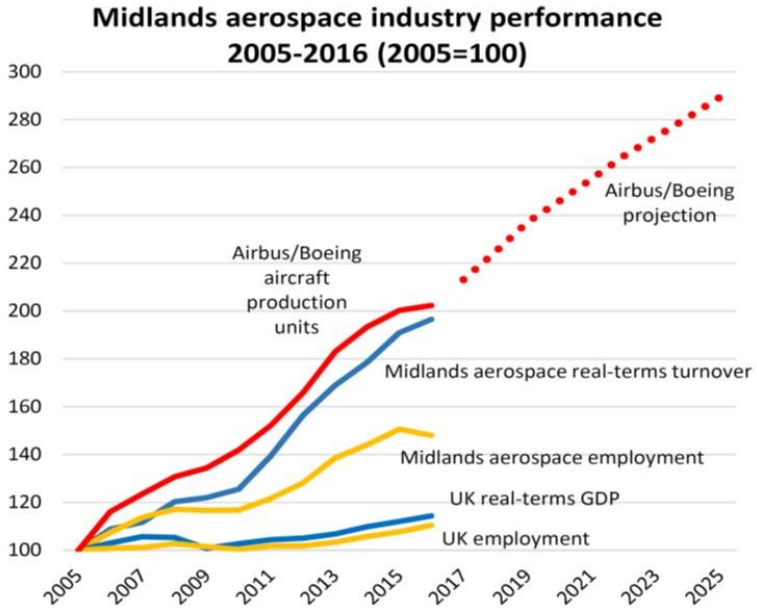
Airbus A380/ Rolls-Royce Trent 900


Pratt & Whitney Purepower

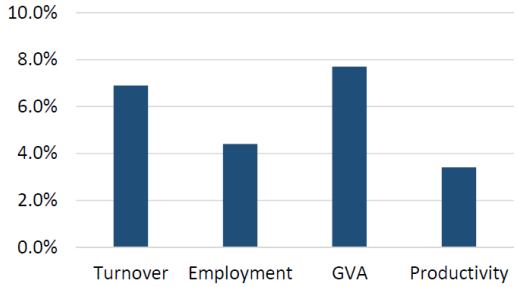

Airbus A320 neo

midlands aerospace alliance

Midlands aerospace growth performance



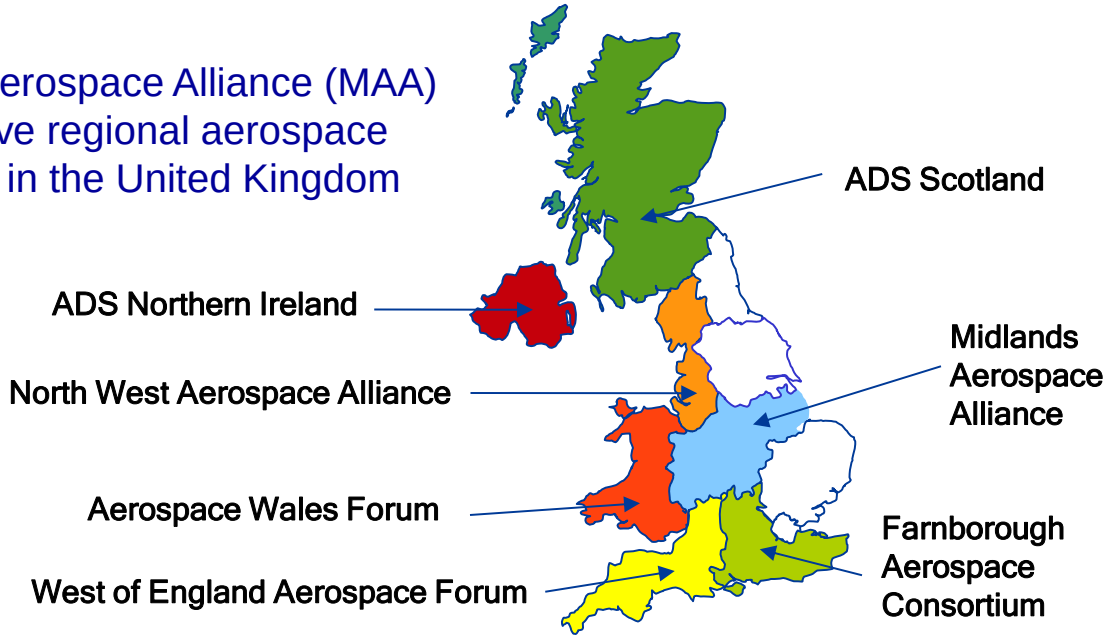
Growth keeps pace with Airbus and Boeing, significantly faster than UK



Strong productivity growth 2005-15

midlands aerospace alliance

Midlands Aerospace Alliance (MAA) one of five regional aerospace alliances in the United Kingdom



midlands aerospace alliance

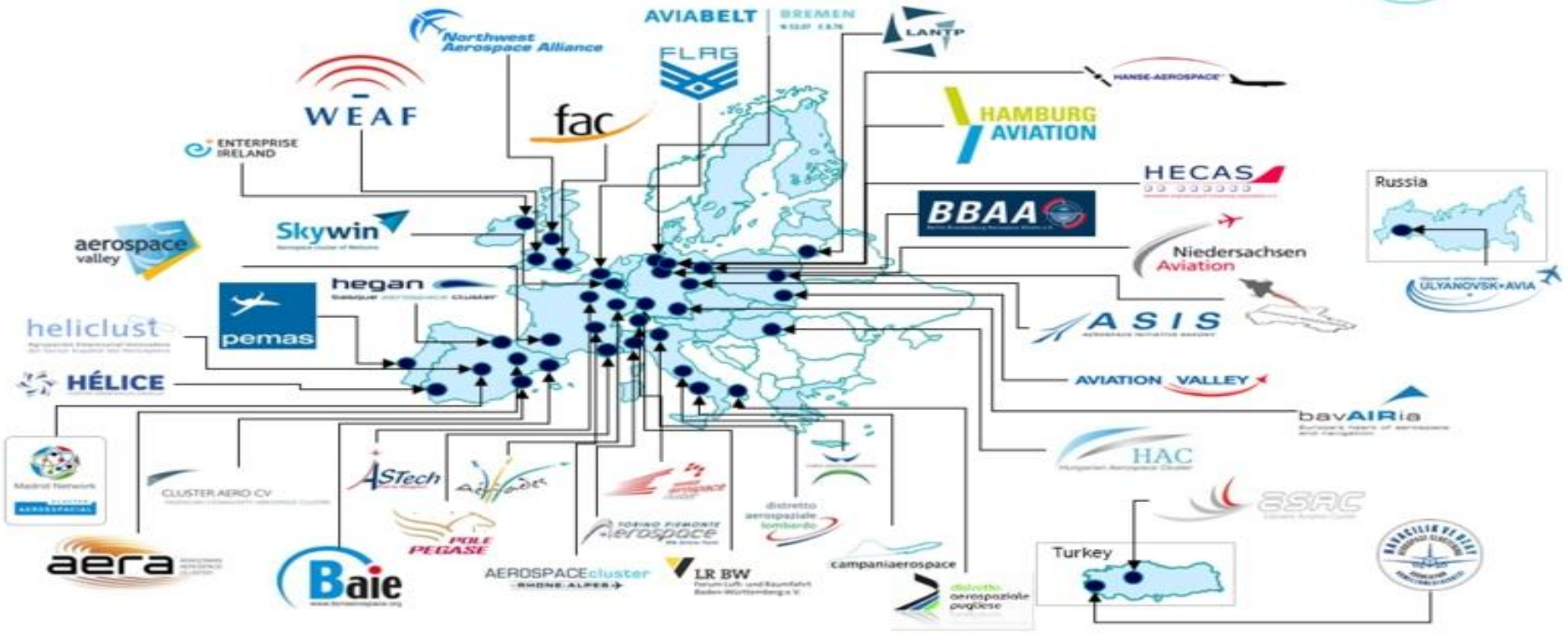
Midlands Aerospace Alliance

- Starts 2003
- 300 member companies, 150 make aircraft parts
- 50 member representatives on Board and three working groups
  - business development
  - innovation and technology
  - supply chain performance

midlands aerospace alliance

Members of the European Aerospace Cluster Partnership

EACP



European Union
European Social Fund ESF
Keeping Hamburg in work

Hamburg

Bringing industry leaders together with our members at MAA conferences

Networking is a vital part of MAA events

Showcasing our members at international airshows

Organising international trade missions to meet key customers

Developing technology roadmaps with member companies


Identifying, funding and mentoring
new technologies in the supply chain

midlands aerospace alliance

MAA Supply Chain Performance Working Group

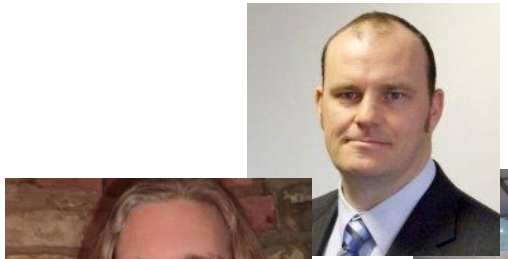
- Meets quarterly since 204
- Chairperson Annette Rothwell, Senior Director, Strategic Sourcing Esterline Corporation and MAA Director

Industry group members

1. AE Aerospace
2. Airbus
3. Amphenol - Invotec Circuits
4. Arrowsmith Engineering
5. Esterline
6. G & O Springs
7. Hauck Heat Treatment
8. Meggitt
9. Pattonair
10. Technoset
11. UTC Aerospace Systems

MAA support for SC21

- Worked to set programme up
- Grant funding
- Expertise, resources for members
- Promotion
- Disseminating information



21st Task Force meeting

Wednesday 10 June 2009

SC21 Task Force
9th April 2013
University of West of England

Advancing UK AeroSpace, Defence and Security Industries

MIDLANDS ENGINE
HM Government

midlands aerospace alliance

11:15 SC21: Case study

Peter Bruch

Managing Director & Co-Owner

AE Aerospace

aerospace

ADS SC21 21ST CENTURY SUPPLY CHAINS

andover precision

Peter Bruch

ADS

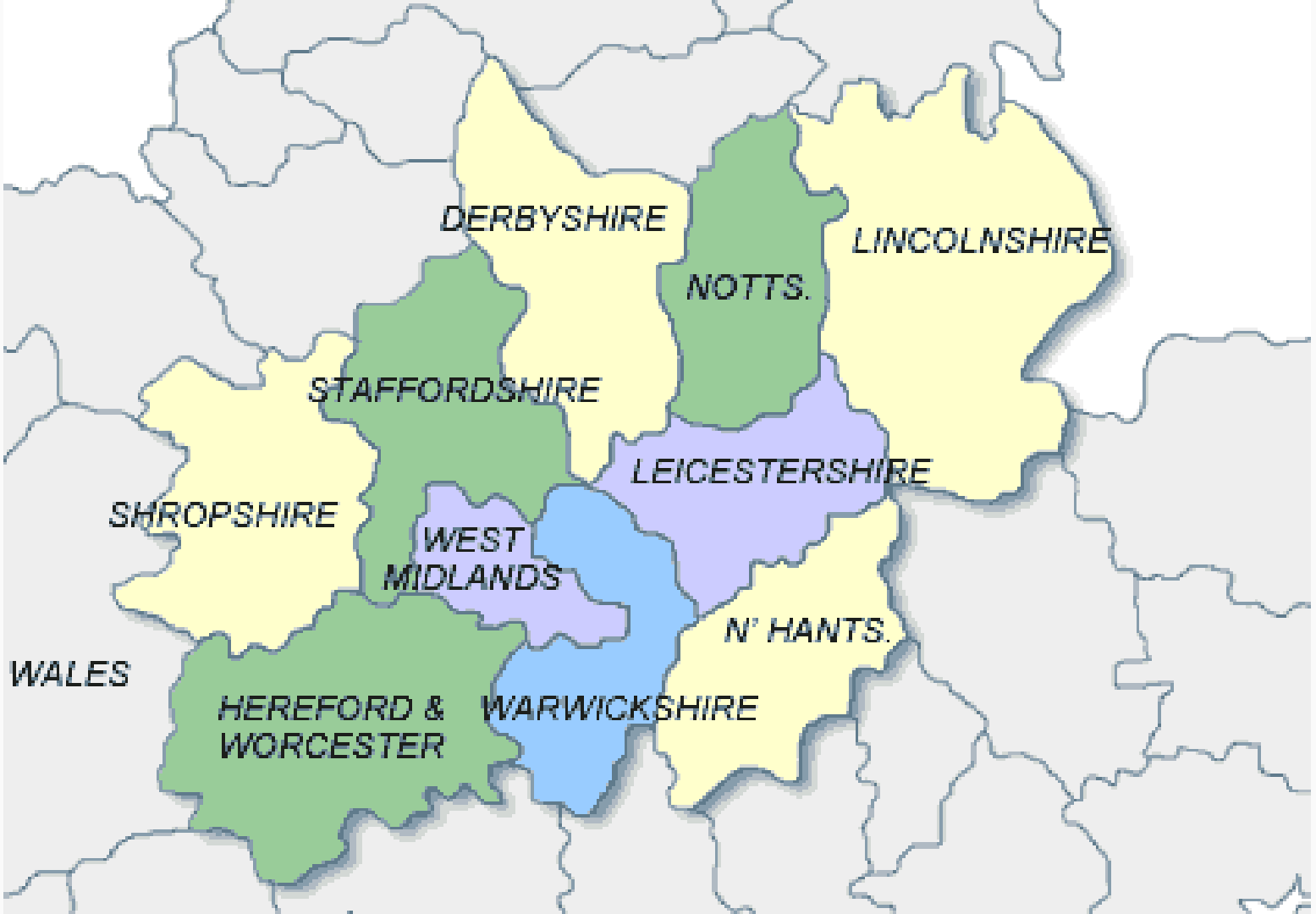
midlands aerospace alliance

CAN YOU KEEP A SECRET?


ADS
SC
21
21ST
CENTURY
SUPPLY
CHAINS

aerospace

CAN YOU KEEP A SECRET?


DERBYSHIRE
NOTTS.
LINCOLNSHIRE
STAFFORDSHIRE
LEICESTERSHIRE
SHROPSHIRE
WEST
MIDLANDS
N' HANTS.
WALES
HEREFORD &
WORCESTER
WARWICKSHIRE

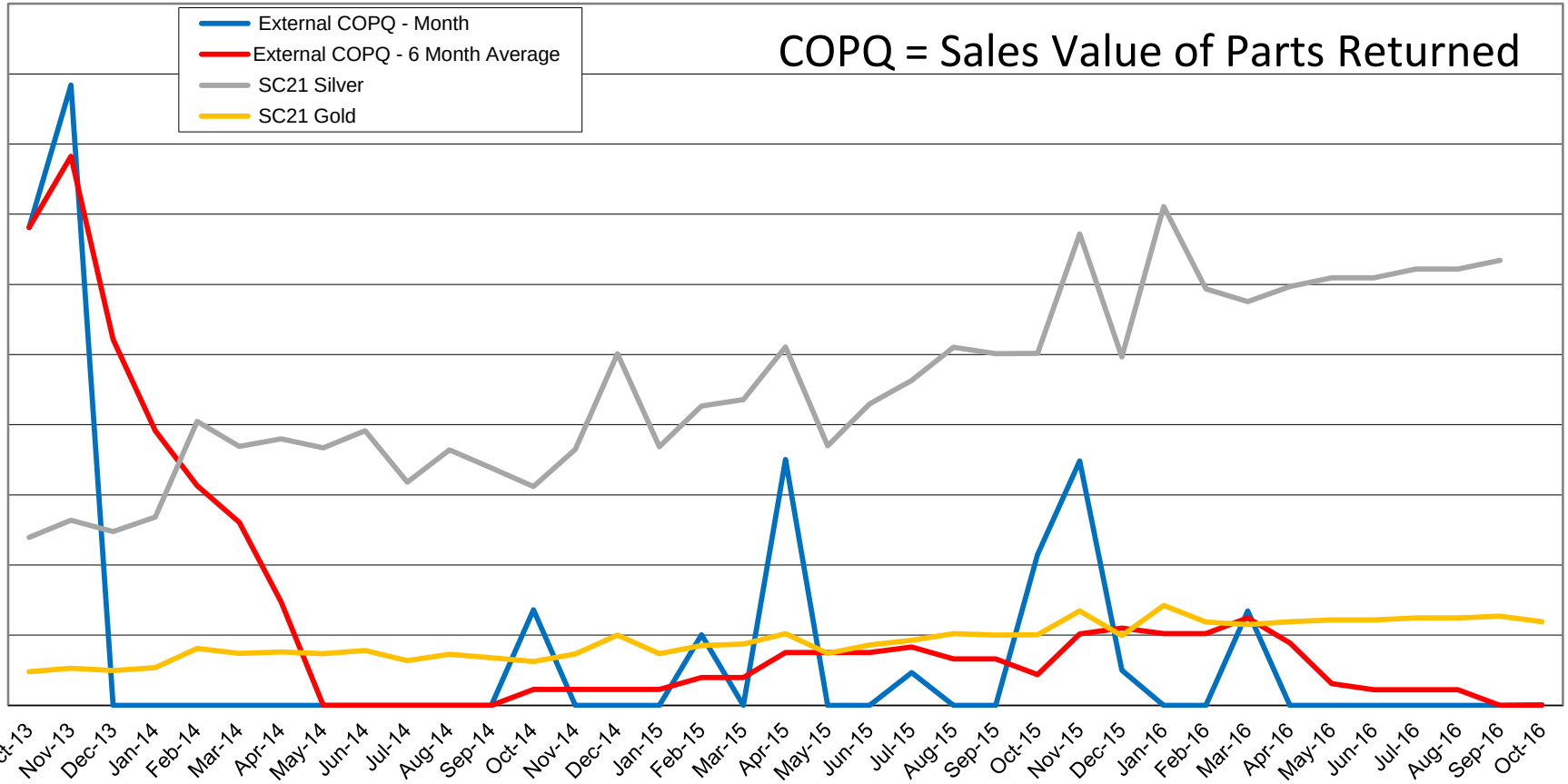
aerospace


ADS
21ST
CENTURY
SUPPLY
CHAINS
SC
21
Bronze Award

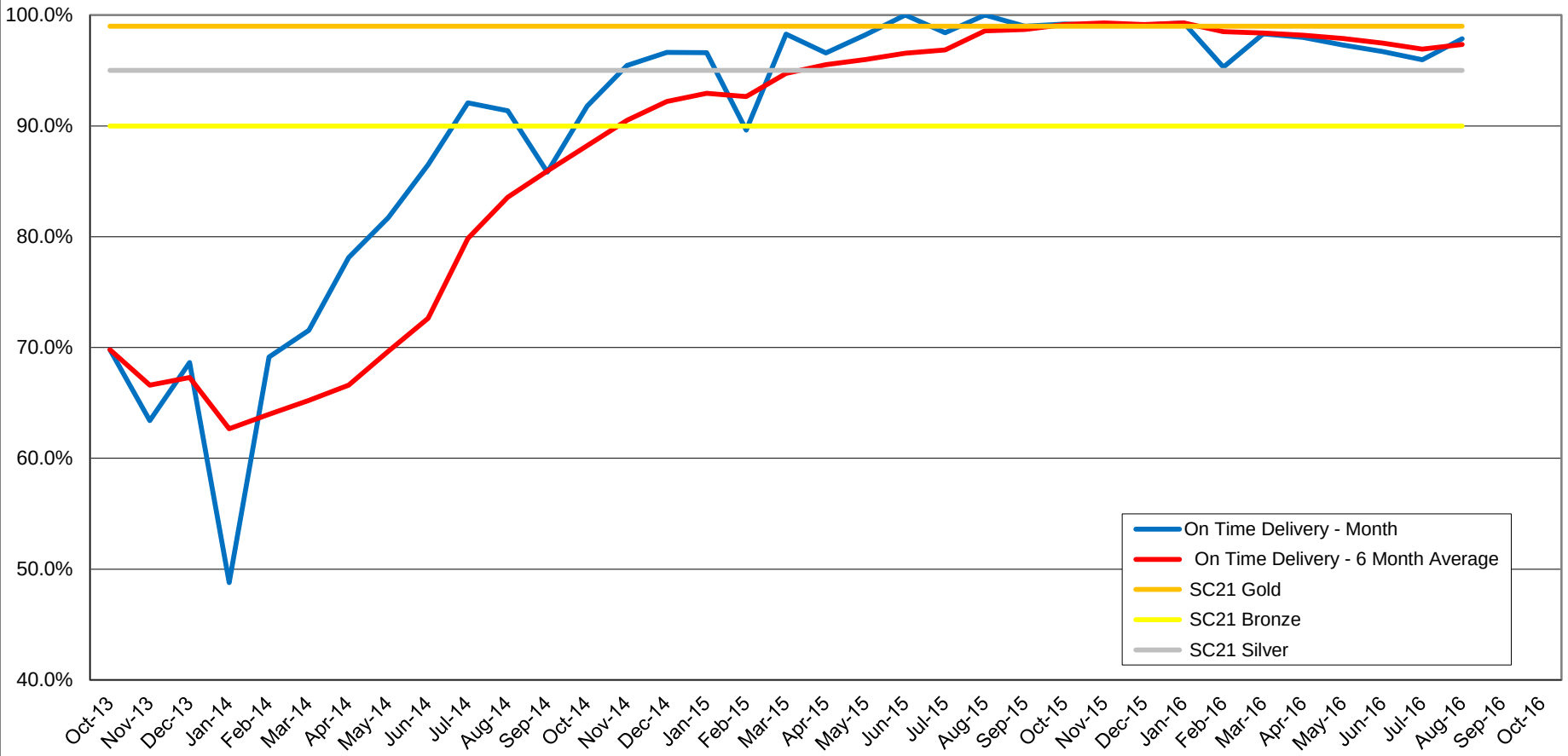

ADS
21ST
CENTURY
SUPPLY
CHAINS
SC
21
Silver Award


ADS
21ST
CENTURY
SUPPLY
CHAINS
SC
21
Gold Award

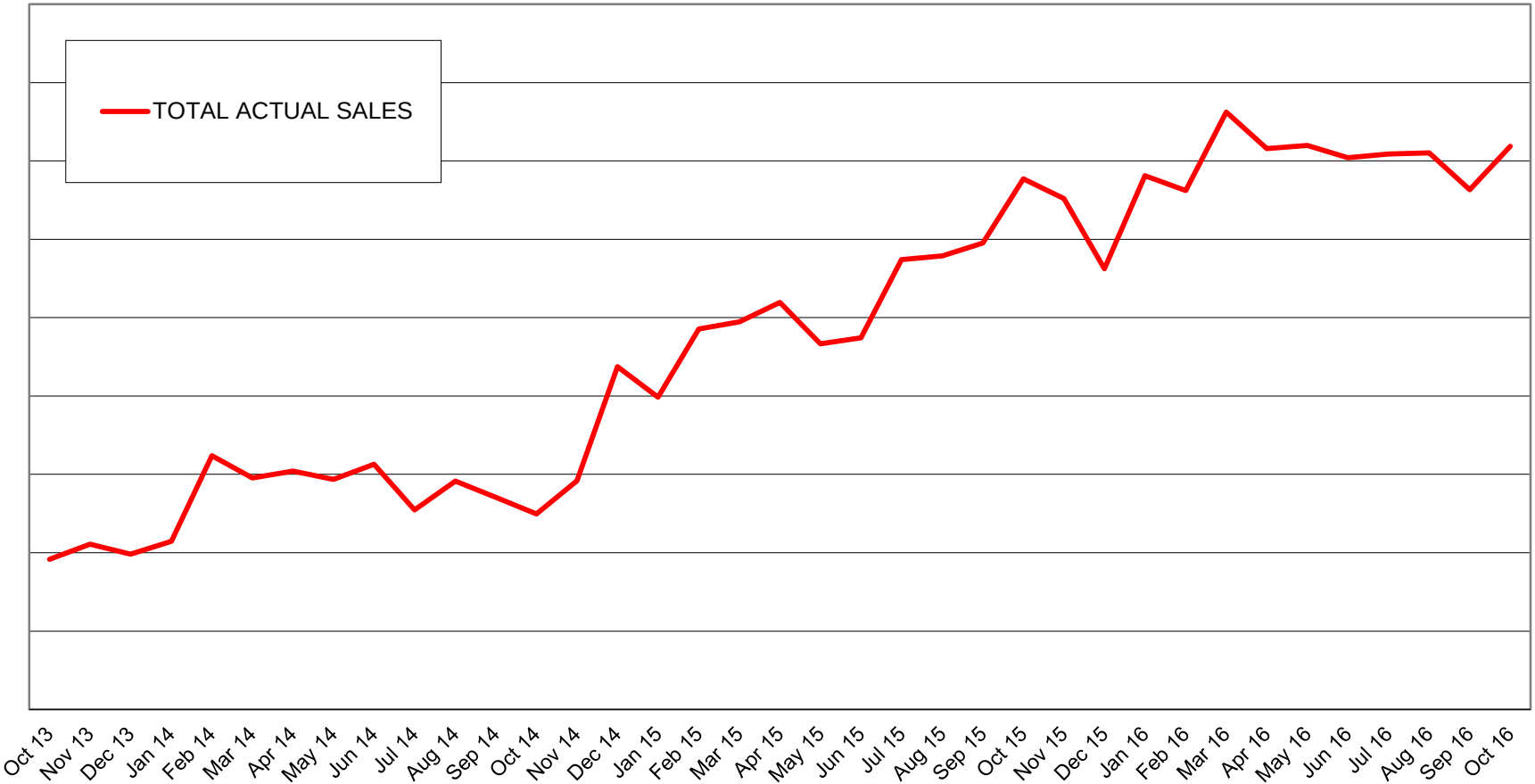
External Cost of Poor Quality (£)



On Time Delivery



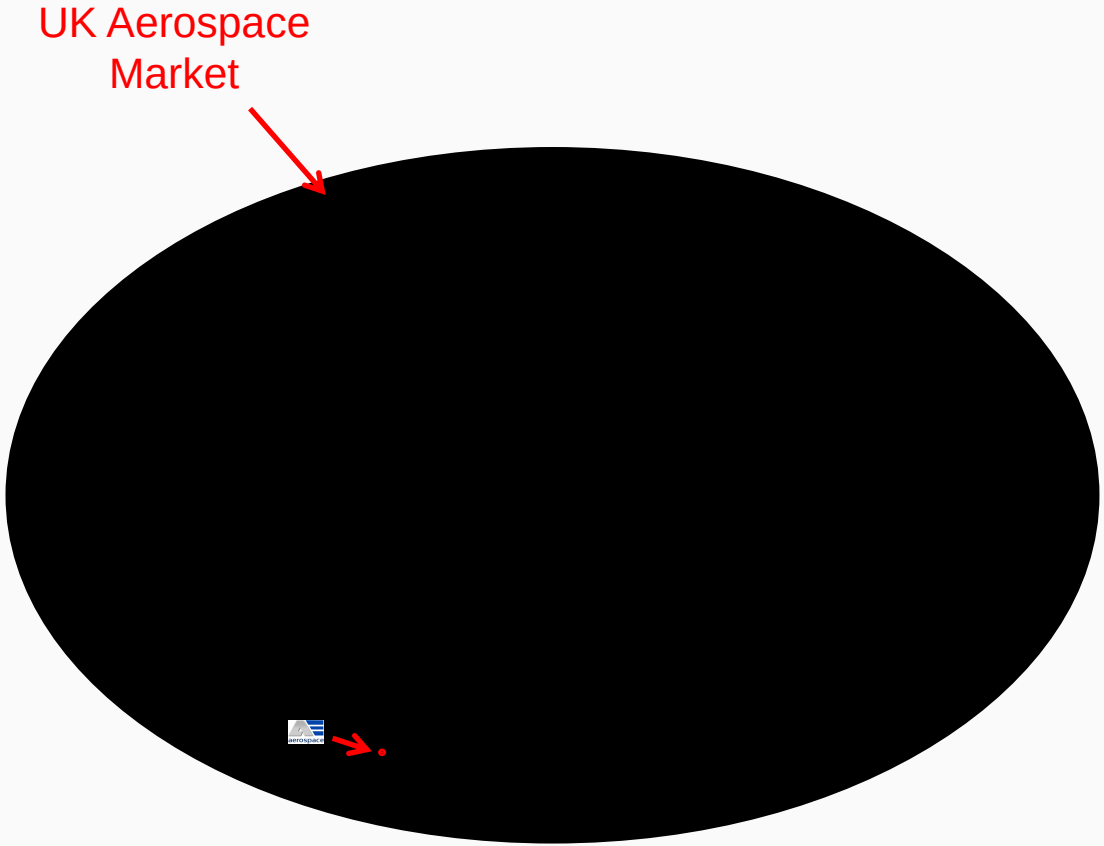
Monthly Sales



?

The Aerospace Market

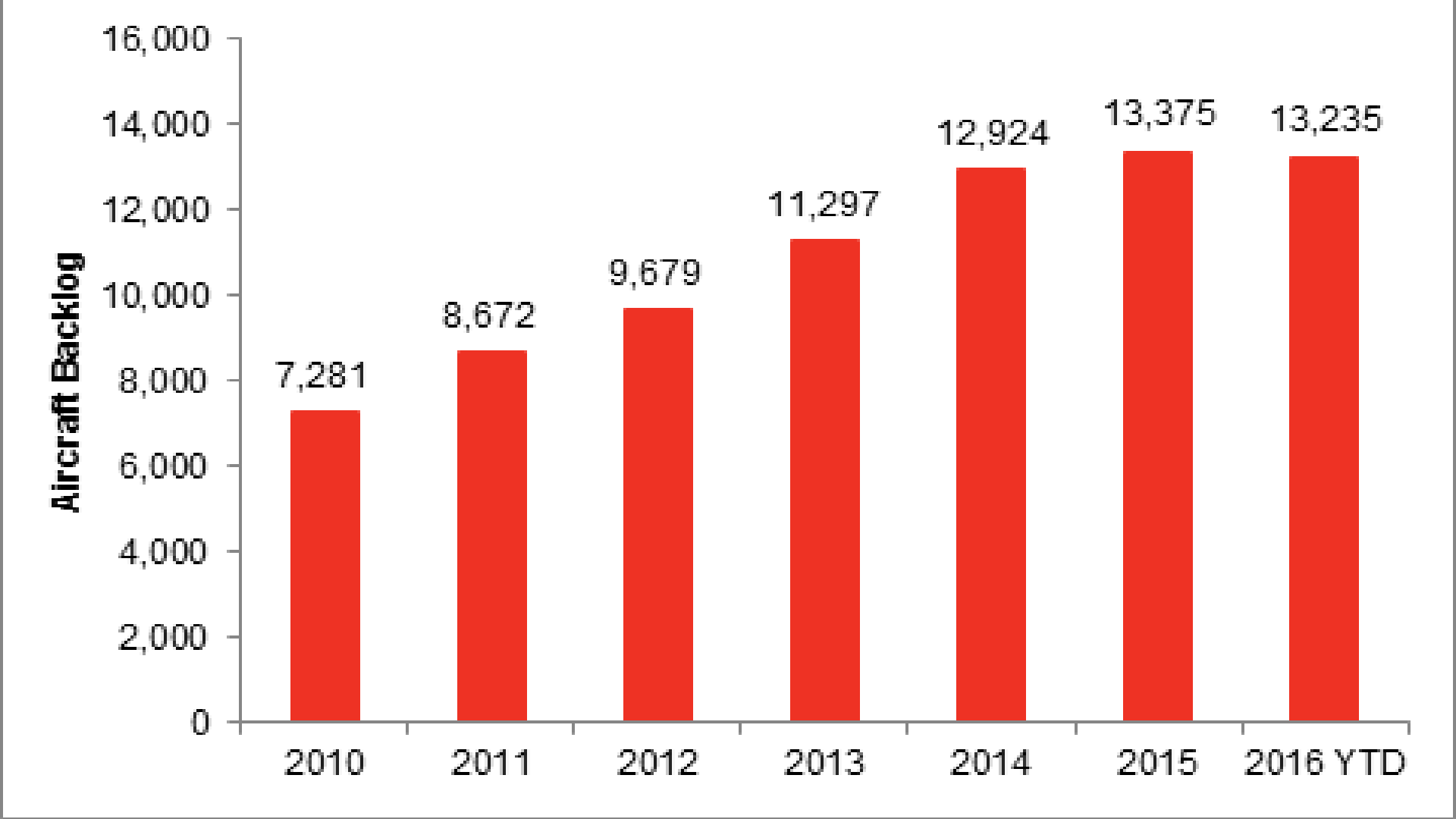
The Aerospace Market



The Aerospace Market

ROW Aerospace Market

Why Improve?


Aircraft Backlog
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
7,281
8,672
9,679
11,297
12,924
13,375
13,235
2010
2011
2012
2013
2014
2015
2016 YTD


AIRBUS


SWELINK

You can all Machine,

what do you do differently,

that will make me order from you?

Customer Question

We take your problems away.

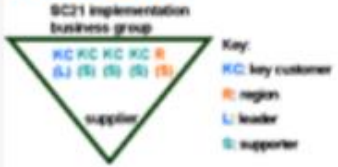
AE Aerospace

Why SC21?

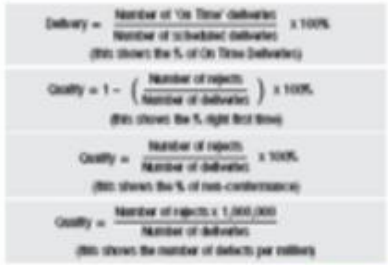

ADS
SC
21
21ST
CENTURY
SUPPLY
CHAINS

CUSTOMER ENGAGEMENT	DIAGNOSTICS	CONTINUOUS SUSTAINABLE IMPROVEMENT PLAN	RECOGNITION

Business group formation



Metrics alignment



Code of practice

Quality certification

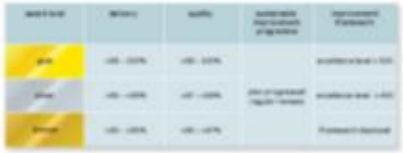
Relationships

Business Excellence

Manufacturing Excellence

CSIP

Award metrics

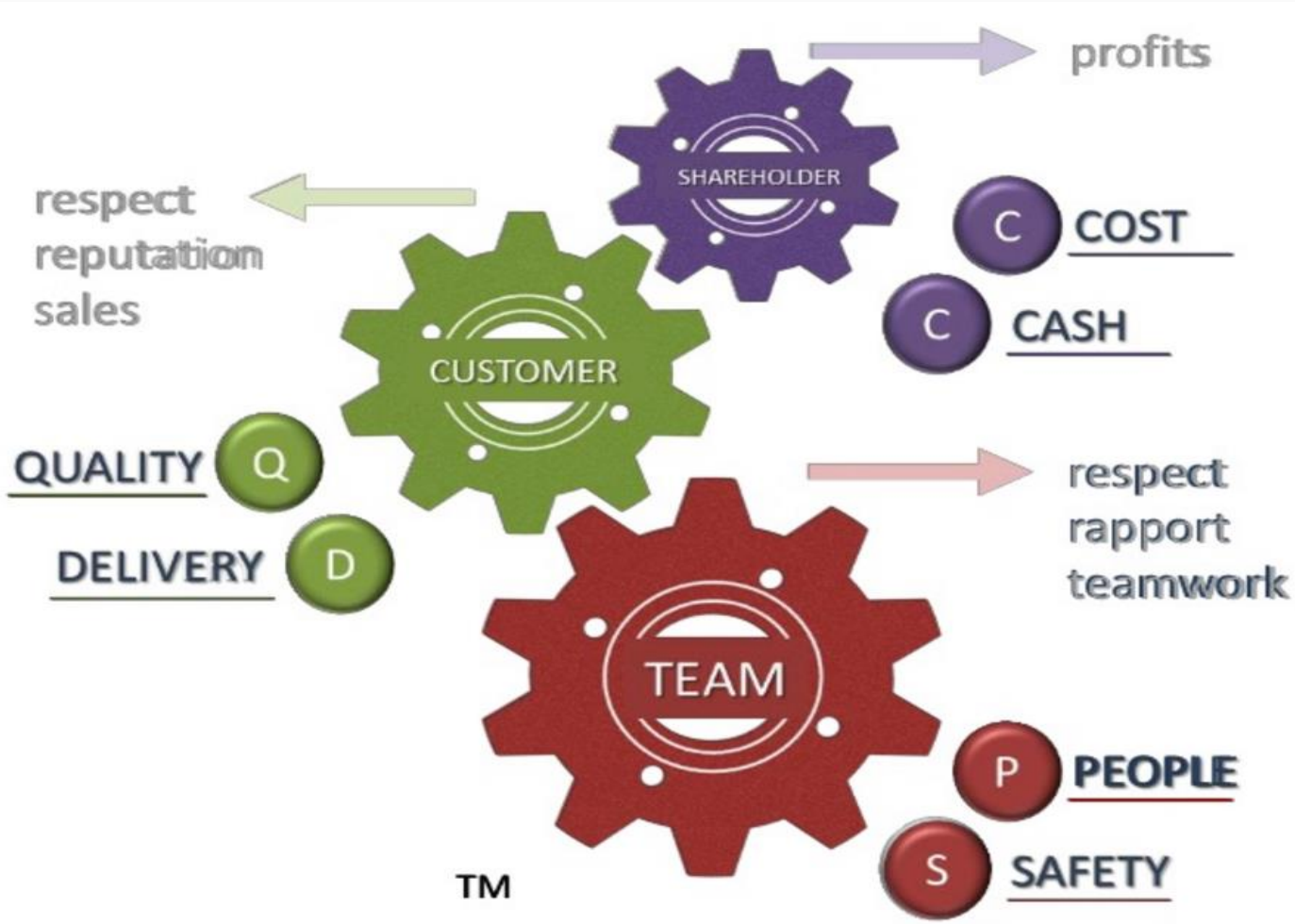


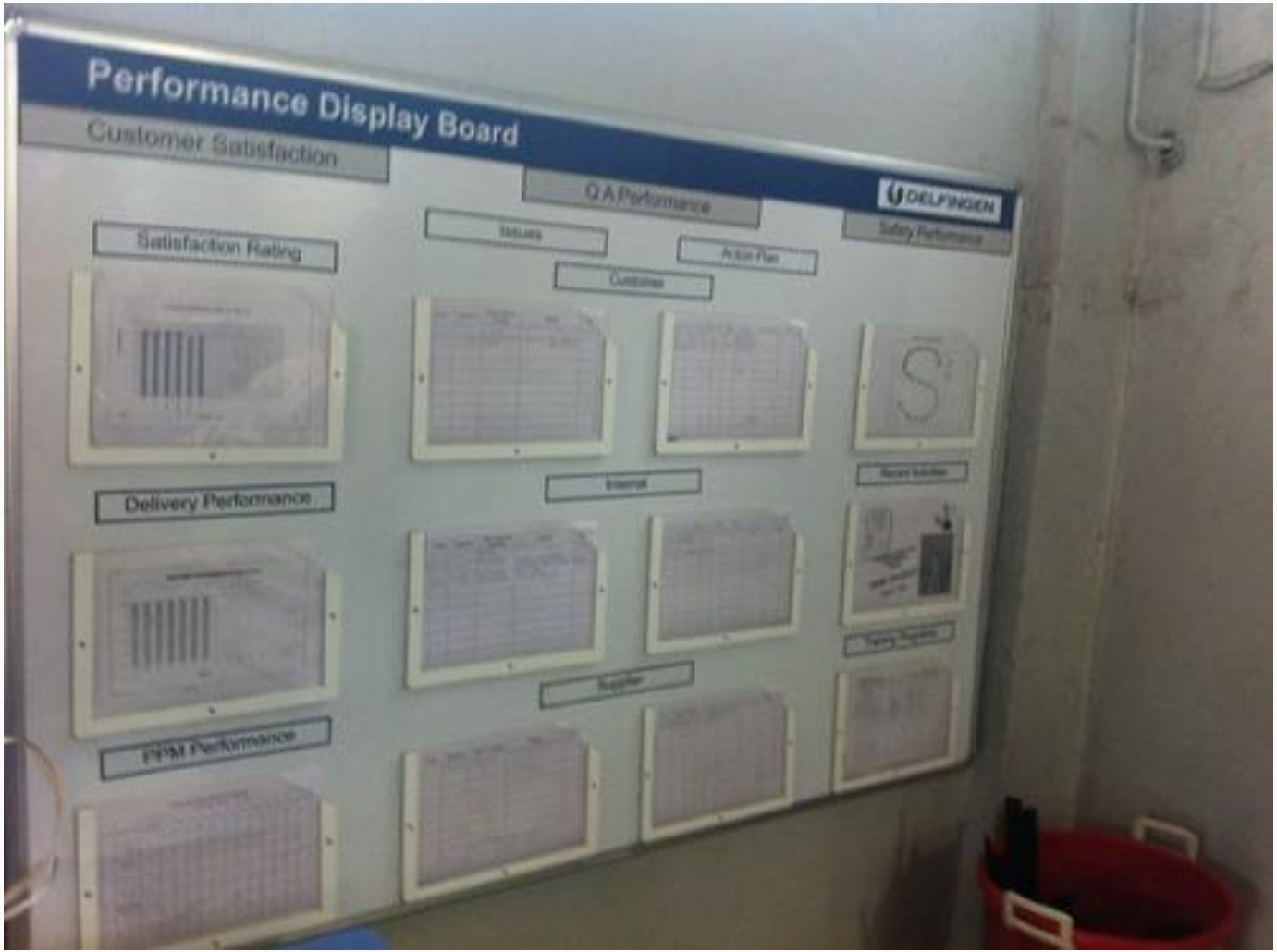
Industry recognition

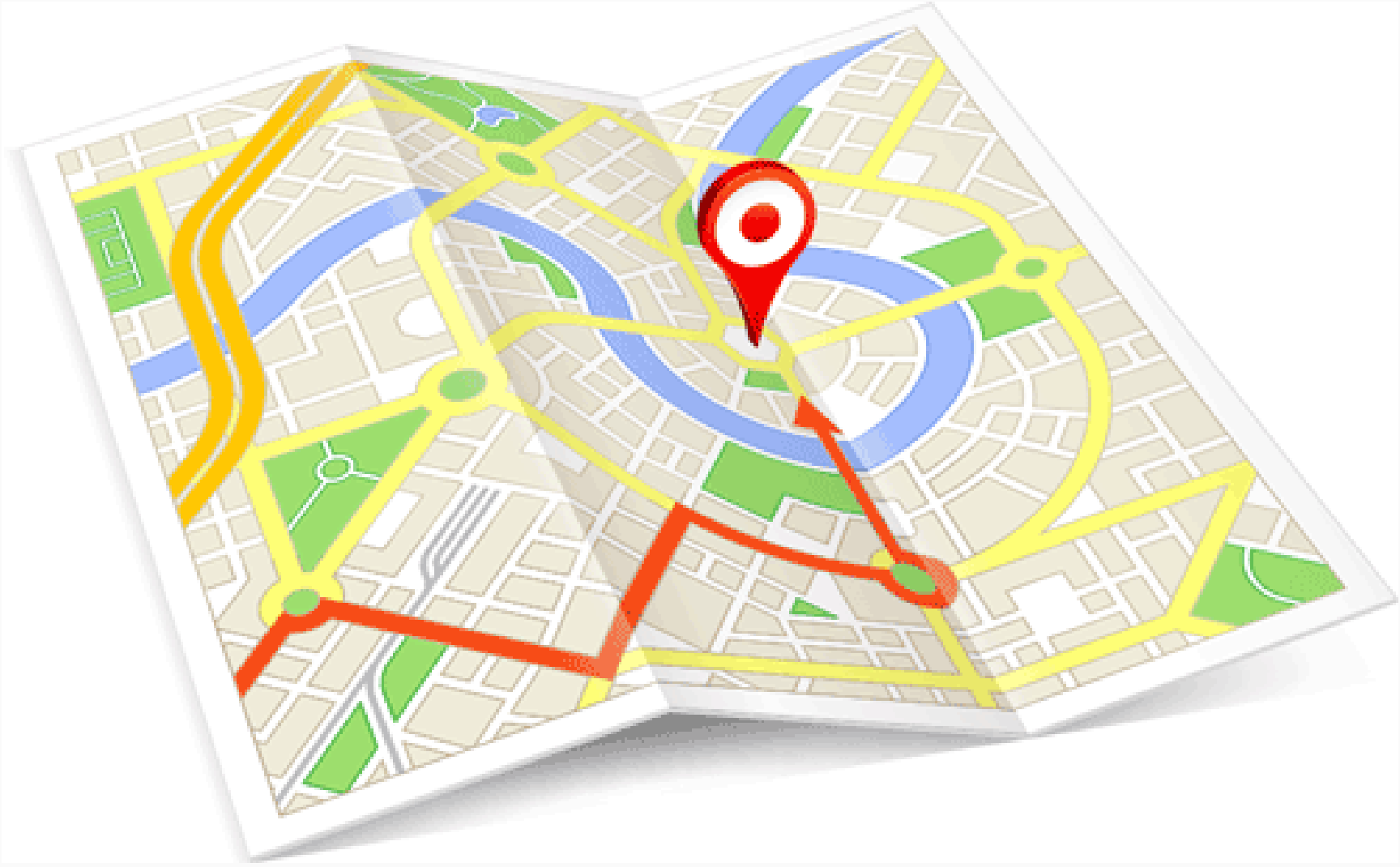

Mazak

How?


Manufacturing
Lean
waste
Waste
Production
production
inventory
value
parts
customer
machine
eliminate
many
waiting
work
Toyota
get
manufacturing
eliminating
Defects
Kanban
improvement
Tools
minimized
Standardized
available
reduce
processes
tools
Poka-Yoke
Shop
often
together
add
Kaizen
Excess
example
methods
article
much
series
way
another
Floor
activities
5S
sub-assemblies
Transportation
practice
simply
new
Inventory
Work
also
Japanese
started
defects
Waiting
different
System
called
Proofing
possible
wasteful
authorities
meet
around
need
everyone
flow
happening
words
Overprocessing
Maintenance
Mapping
SMED
category
multi-part
see
just
following
organizing
motion
number
product
quality
focused
including
achieve
take
definition
emphasis
ideal
needed
Principles
finding
raw
becomes
create
thought
considers
terms
reasons
less
used
Pull
line
minimizing
Parts
able
may
results
term
adding
Material
Supply
cost
lean
goods
first
lot
time
systems
errors
happen
preventative
part
link
goal
operator
Chain
focus


profits
SHAREHOLDER
C COST
C CASH
respect
reputation
sales
CUSTOMER
QUALITY Q
DELIVERY D
respect
rapport
teamwork
TEAM
P PEOPLE
S SAFETY
TM


Performance Display Board
Customer Satisfaction
Satisfaction Rating
Delivery Performance
PPM Performance
QA Performance
Issues
Action Plan
Customer
Internal
Supplier
DELPHIGEN
Safety Performance



Thank You!

David Singleton - RRCS

Tim Holmes – Formerly of RRCS, now Pattonair

Rolls-Royce

Serious Slides

Prime’s / OEM’s


AIRBUS
BOMBARDIER
the evolution of mobility
BOEING
GE
GKN
LEONARDO
Rolls-Royce
SAFRAN
SPIRIT
AEROSYSTEMS
THALES
UTC Aerospace Systems

Help us,

To help you!

What’s your annual spend?

What’s your Cost Reduction target?

1%

2%

5%

Why not invest into an SC21 Supplier Development Team?

Work with your Supply Chain

Benefits to the OEM

SC21 companies deliver **Quality**

On time

Reliably

At Lower Cost

How to help the Supply Chain further….

Give priority to SC21 Companies

Long Term Agreements

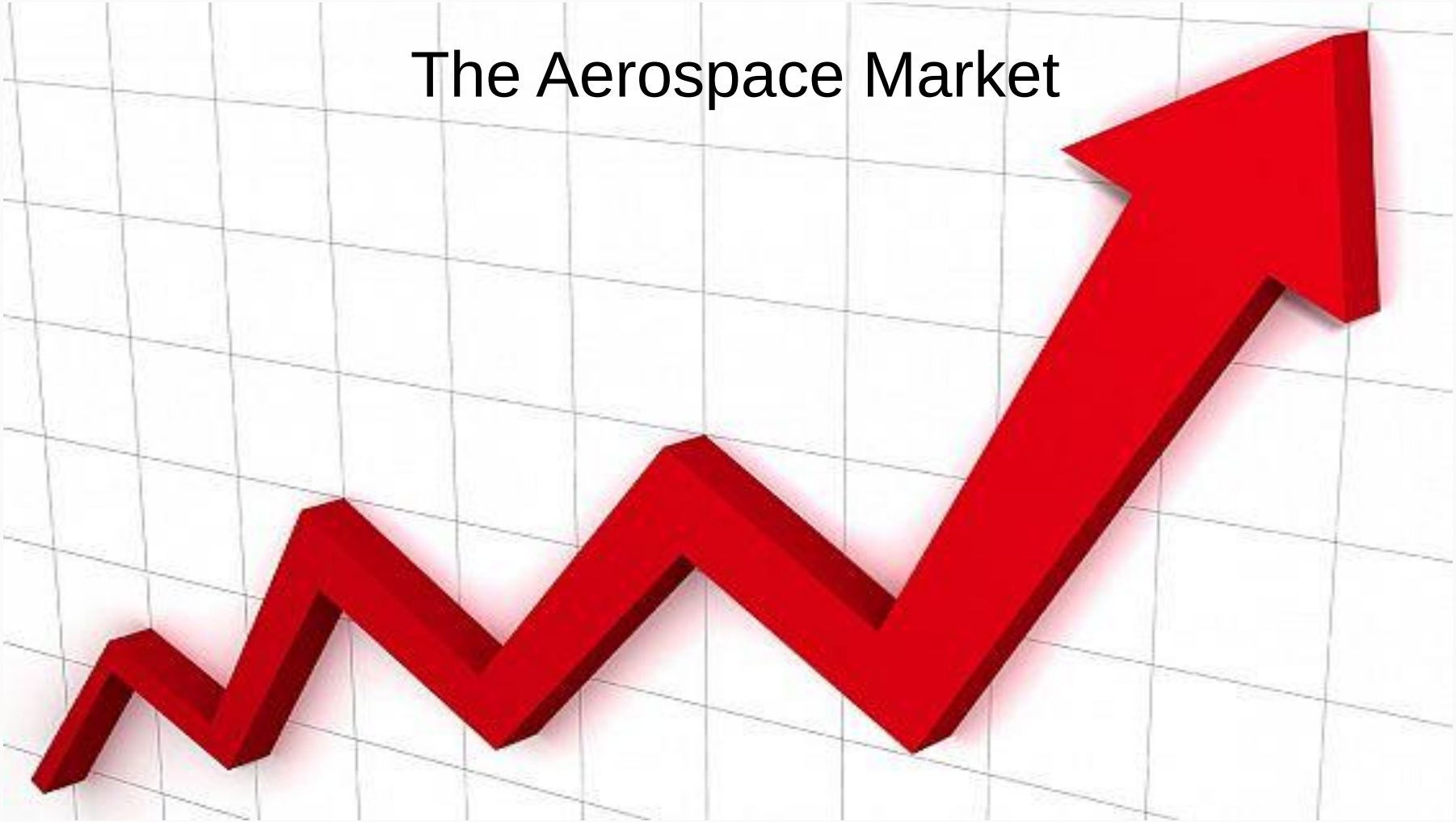
Supply Chain Companies

Support the OEM’s

Be a Self Starter

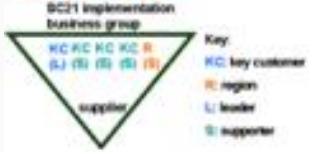
Why are we going for Gold?

The Aerospace Market



CUSTOMER ENGAGEMENT	DIAGNOSTICS	CONTINUOUS SUSTAINABLE IMPROVEMENT PLAN	RECOGNITION

Business group formation



Metrics alignment

Code of practice

Quality certification

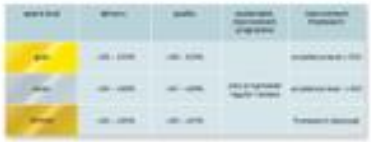
Relationships

Business Excellence

Manufacturing Excellence

CSIP

Award metrics



Industry recognition


TEAM
WORK


TOYOTA

Sales Pitch

Warning – Sales Pitch!

- High Precision machining for P
  Aftermarket Spares – 'Stranger
- 2, 3, 4 & 5-axis CNC machining
- Size range
  - AE Aerospace from 2mm
  - Andover Precision from 2
- Full Supply chain management
  broaching, wet and dry proces


Mazak
SMOOTH
TECHNOLOGY
INTEGREX
j-200S
ZATROL SM

Who do we make it for

Let’s help each other to win.

aerospace

ADS SC21 21ST CENTURY SUPPLY CHAINS

andover precision

Peter Bruch

ADS

midlands aerospace alliance

11:30 **Coffee break**

12:00 **Award Presentation**

Bronze Award Winner

ELLSWORTH ADHESIVES · EUROPE

21ST CENTURY SUPPLY CHAINS

Bronze Award

Sponsor: Self starter

Awarder: Neil Barnett

Bronze Award Winner

Exception

Delivering Global CEM Solutions

Sponsor: LEONARDO

Awarder: Christopher Shurmur

Bronze Award Winner

Graves Aircraft Components

ADS SC21 21ST CENTURY SUPPLY CHAINS Bronze Award

Sponsor: Rolls-Royce

Awarder: David Singleton

Bronze Award Winner

IntelliConnect
A different kind of Interconnect Solutions Provider

ADS SC21 21ST CENTURY SUPPLY CHAINS
Bronze Award

Sponsor: Self starter

Awarder: Neil Barnett

Bronze Award Winner

Sponsor: THALES

Awarder: Jerry Mabey

Bronze Award Winner

Nasmyth GROUP

ADS SC21 21ST CENTURY SUPPLY CHAINS Bronze Award

Sponsor: Rolls-Royce

Awarder: David Singleton

Bronze Award Winner

ALA
ADVANCED LOGISTICS FOR AEROSPACE

ADS SC21 21ST CENTURY SUPPLY CHAINS
Bronze Award

Sponsor: Self starter

Awarder: Neil Barnett

Bronze Award Winner

Sponsor: Self starter

Awarder: Neil Barnett

Bronze Award Winner

WOOD GROUP

Sponsor: Self starter

Awarder: Neil Barnett

Re-Bronze Award Winner

abp
INNOVATION IN ENGINEERING

ADS SC21 21ST CENTURY SUPPLY CHAINS
Bronze Award

Sponsor: THALES

Awarder: Jerry Mabey

Re-Bronze Award Winner

D & S Engineering

Sponsor: THALES

Awarder: Jerry Mabey

Re-Bronze Award Winner

Hydro Group plc.

21ST CENTURY SUPPLY CHAINS Bronze Award

Sponsor: THALES

Awarder: Jerry Mabey

Re-Bronze Award Winner

Sponsor: THALES

Awarder: Jerry Mabey

Silver Award Winner

Sponsor: Self starter

Awarder: Neil Barnett

Silver Award Winner

ARROWSMITH

Arrowsmith Engineering (Coventry) Ltd

ADS SC21 21ST CENTURY SUPPLY CHAINS Silver Award

Sponsor: Rolls-Royce

Awarder: David Singleton

Silver Award Winner

Sponsor: Self starter

Awarder: Neil Barnett

Silver Award Winner

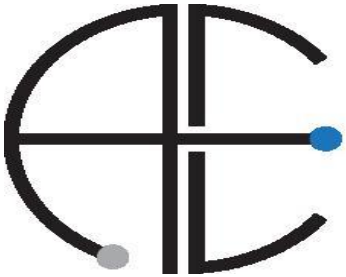
HAUCK HEAT TREATMENT
UNITED KINGDOM

ADS SC21 21ST CENTURY SUPPLY CHAINS
Silver Award

Sponsor: Self starter

Awarder: Neil Barnett

Re-Silver Award Winner



ACTIVE ELECTRONICS

Sponsor: THALES

Awarder: Jerry Mabey

Re-Silver Award Winner

Esterline

Darchem Engineering

Sponsor: Self starter

Awarder: Neil Barnett

Re-Silver Award Winner

LUBRICANTS.
TECHNOLOGY.
PEOPLE.

FUCHS

ADS SC21 21ST CENTURY SUPPLY CHAINS Silver Award

Sponsor: Self starter

Awarder: Neil Barnett

Re-Silver Award Winner

GROVELEY
PRECISION ENGINEERING

ADS SC21 21ST CENTURY SUPPLY CHAINS
Silver Award

Sponsor: Self starter

Awarder: Neil Barnett

Re-Silver Award Winner

HITEK
ELECTRONIC MATERIALS LTD

ADS SC21 21ST CENTURY SUPPLY CHAINS Silver Award

Sponsor: Self starter

Awarder: Neil Barnett

Re-Silver Award Winner

NEMCO
Concept to Production Electronics

ADS SC21 21ST CENTURY SUPPLY CHAINS
Silver Award

Sponsor: THALES

Awarder: Jerry Mabey

Gold Award Winner

Wincanton

ADS SC21 21ST CENTURY SUPPLY CHAINS Gold Award

Sponsor: Self starter

Awarder: Neil Barnett

13:00 **Lunch & Networking time**

14:00 End of the Task Force

Thank you for your attendance