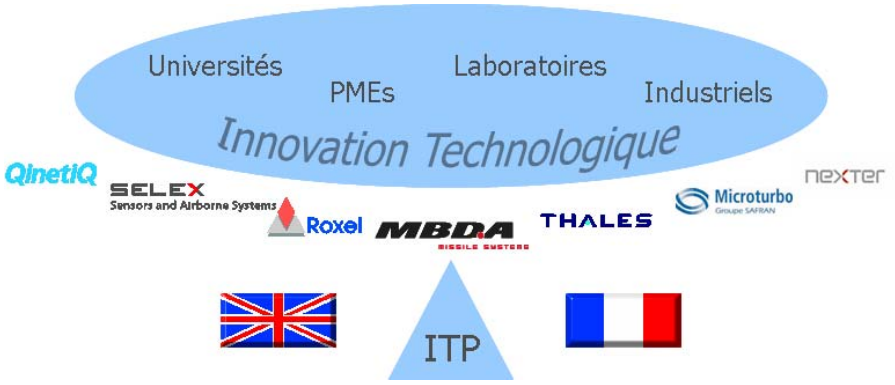
MBDA
MISSILE SYSTEMS

INNOVATION AND TECHNOLOGY PARTNERSHIP ON MATERIALS & COMPONENTS FOR MISSILES

MCM ITP Handbook 2010

Issue 1



Copyright Notice

Contents

This page is intentionally left blank.

1 Scope of the Handbook

This handbook is intended to provide organisations who are not familiar with the Materials and Components for Missiles (MCM) Innovation and Technology Partnership (ITP) programme with an introduction to its strategy and processes.

1.1 Background to the MCM ITP

The MCM ITP was established in response to a statement of work issued by the UK MoD Research Acquisition Organisation (RAO)[1], with agreement from the Direction générale de l'armement (DGA).

It is a joint ambition of the UK and French defence ministries that the MCM ITP provides a focus for Anglo-French collaboration and co-ordination of research on guided weapon technologies across MoDs, industries and academia. The fundamental objective is to exploit collaboration between leading British and French industrial concerns and academic establishments in the delivery of low technology readiness level (TRL) technologies relevant to future guided weapons.

The MCM ITP is the first Anglo-French collaborative research and technology (R&T) initiative with the objective of maximising collaborative acquisition in the development of future guided weapons research programmes. Greater collaboration within Europe is considered to be essential and the MCM ITP represents a first step in this process.

The focus of the MCM ITP programme is to deliver a portfolio of collaborative research projects:

- At low Technology Readiness Level (TRL)<4
- Focussing research activities within the academia/SMEs
- Pulling through innovative research into the TDP/PEA stage of the development cycle
- Addressing future UK/French capability requirements in the 2015-20 timeframe.

The MCM ITP was launched in December 2007 as a 3 year programme. Following it's successful launch, the current programme has been extended by 2 years, concluding in 2013.

[1] Following the re-structuring of the UK MoD research bodies, the MCM ITP is now managed by Dstl

1.2 Budget

The ITP operates a matched funding model where the cost of the research is split equally between the government and the proposing organisation(s).

	UK	**FR**
Government	£2.5m	€3.5m
Matched Industry funding	£2.5m	€3.5m
Total	**£5m**	**€7.0m**

Hence the annual budget is approximately £5m and 7.0m€.

There is an obligation to conduct approximately 30% of the research with Small to Medium Enterprises (SMEs) and academics.

1.3 Consortium and structure

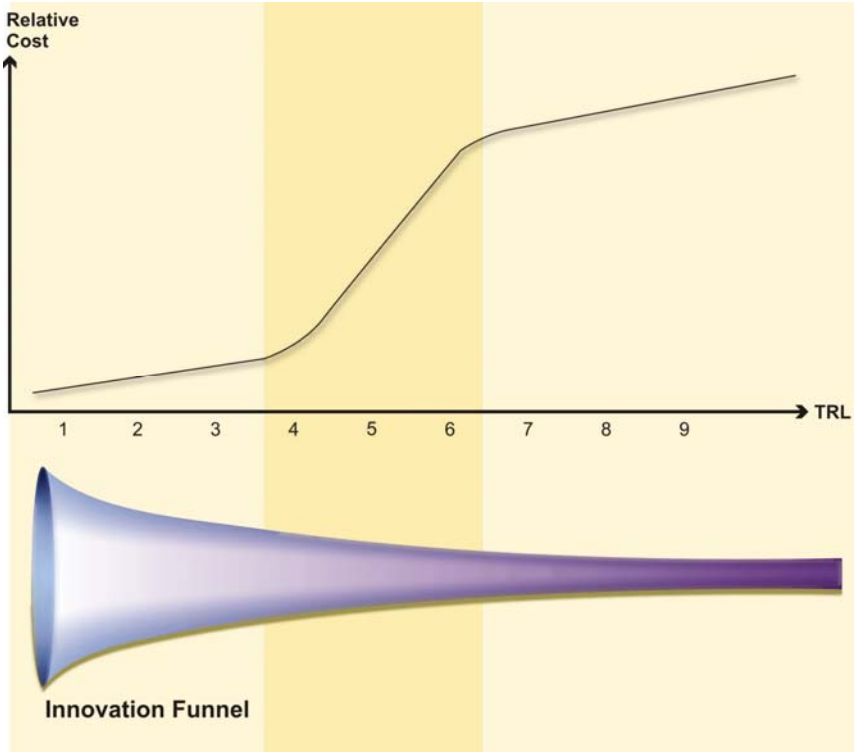
MBDA leads a consortium of industrial and academic partners to deliver a portfolio of research proposals. All the core consortium members have established backgrounds in the progression and development of technologies from fundamental research through to application within developed products.

The portfolio is structured into eight technology domains, each led by a consortium member (a Domain Lead). These domains, representing the missile sub-systems, have been identified to cover the technology needs of the DGA/MoD.

	Domain	Domain Lead	Nationality
1	System level studies	MBDA	UK
2	Sensor studies – RF	THALES AIRBORNE SYSTEMS	FR
3	Sensor studies – IR	SELEX GALILEO	UK
4	Rocket propulsion	ROXEL	FR
5	Turbo propulsion	MICROTURBO	FR
6	Warheads	QINETIQ (+ NEXTER)	UK/FR
7	Fuzes and SAUs	THALES MISSILE ELECTRONICS	UK
8	Materials and electronics	MBDA	FR

2 The Strategy

2.1 The Innovation Process



The innovation process is intended to take ideas and turn them into products. This can be described as moving up the TRL scale which typically has 9 levels (see Appendix A). The ITP is concerned with the first 3-4 levels. As technologies mature, they will cost more to progress to the next TRL and the innovation funnel is intended to illustrate that in a competitive environment the number progressing will decrease.

The strategy is to ensure that the MCM ITP matures technologies to an intermediate level (TRL 3-4) until there is a requirement for the capability that the technology could deliver.

2.2 The Domain strategy

Each domain has published a strategy which can be found in the conference proceedings of the MCM-ITP Conference 22 & 23 June 2009, proposers are encouraged to contact domain leads (refer to section 5) for the most recent strategy papers. The key points are summarised below.

2.2.1 Domain 1: Systems

This domain considers:

- System concepts and architectures - how to use existing technologies in novel ways
- Guided weapons techniques – basic research into system technologies such as image processing, guidance, navigation, control, aerodynamics, human factors and communications
- Processes, modelling and tools - priorities are concerned with reducing whole life cycle costs and the amount of effort required to integrate a technology

2.2.2 Domain 2: Radio Frequency (RF) Seekers

This domain considers RF seekers which can be thought of as miniature radars. The main drivers are to reduce whole life cost and improve accuracy and performance.

- RF Devices - 50% of this system is taken up by the transmitter and gimbal, receivers and frequency references
- Dual mode seeker- integration of Electro-Optic (EO) sensors, datafusion and dome material
- Synthetic aperture radar

2.2.3 Domain 3: EO Seekers

The focus of the research is on high priority areas for the UK and French guided weapons EO industry.

- On-board passive and active imaging EO sensors and Semi Active Laser (SAL) sensors
- Passive and active proximity fuzing and EO altimeter
- Reduce whole life cycle cost and enhance capability against difficult operation scenarios

2.2.4 Domain 4: Rocket Propulsion

This domain is concerned with rocket propulsion for tactical missiles. The main themes are concerned with:

- Thrust modulation
- Thrust vector control
- Insensitive munitions
- Sensors for service life surveillance and extension
- Hybrid propulsion
- Smart motors

2.2.5 Domain 5: Air Breathing Propulsion

This domain considers turbojets, turbofans, turboprops and hybrid engines based of turbojets. The domain excludes ramjets.

The research themes are:

- Reduce fuel consumption
- Enlarge flight envelope
- Depletable engine
- Disruptive Turbo Jet Engine architectures
- Improved engine/aircraft integration

2.2.6 Domain 6: Warheads

This covers all target defeat mechanisms such as explosive effects, penetrators or novel “non lethal” effects.

- Technology for insensitive munitions
- Improved performance/efficiency
- Effects against wider target set
- Improved degree and type of effect
- Tools and techniques
- Novel/disruptive technology

2.2.7 Domain 7: Fuzes and SAU

This domain is expected to cover all fuzing technologies for pre and post impact. These may include:

- Target detection device technologies,
- Safety technologies,
- Initiation technologies
- Environmental sensor technologies.

Post impact technologies are required for penetration of bunkers or allowing the missile to determine which floor of a building it has penetrated.

2.2.8 Domain 8: Materials and Electronics

This domain covers two disciplines each of which contains a very wide spectrum of technologies.

Topics for materials include:

- New composite materials (refractory, advanced ceramics)
- Polymers composites
- Smart materials, nano-materials
- Smart control and morphing, sensing and control actuation
- Smart morphing composites
- Low observable materials
- Fragmentable materials for covers
- Simulation and modelling techniques.

Topics for Electronics include

- Micro technologies (MEMS) and nanotechnologies (nanomaterials, nano electronics)
- System on chip
- System in package
- Safety architecture (electronics and software)
- Technologies behaviour and modelling
- Batteries or energy storage devices for micro-missiles
- Future Commercial Off The Shelf (COTS) technology for missile applications
- Innovative data transmission technologies.

3 The Procedure and Timescales

3.1 Awareness

There are two funding streams within the MCM ITP programme:

- **Tasking programme**: An annual Call for Proposals is announced in April/May. Preliminary proposal summaries are expected to be submitted to the appropriate Domain Lead in June. Following a preliminary review, full technical proposals will be requested for submission in September. For further details, please refer to section 3.2.
- **Innovation fund**: A nominal amount of the budget is set aside to fund emerging ideas. Submissions through this route are welcomed throughout the year. For further details, please refer to section 3.3

3.2 Tasking programme

3.2.1 Generating an idea

It is crucial that ideas proposed tie in with the ITP strategy described in the previous section. Further details of the domain strategy can be sourced from the domain leads (refer to section 5) to understand if there will be any interest in their proposals.

3.2.2 Find a partner and determine collaboration

All proposals have to be Anglo-French. Points of contact at section 5 can assist in finding a partner.

The recommended procedure is to establish a Non Disclosure Agreement (NDA) to protect all parties and permit detailed discussion to take place without compromising any Intellectual Property (IP).

3.2.3 Summary Proposal

Once a topic for research has been developed a proposal must be submitted before the June deadline in accordance with the template at Appendix B. It will be necessary to provide either Rough Order of Magnitude (ROM) or Not To Exceed costs and explain how contributions will be made.

Note: The individual domain leads can advise the timescales associated with their bid programme.

3.2.4 Domain Internal Selection

In July, all domains will review the submitted proposals alongside the customers representatives. At this stage, the intention is to down-select a preliminary set of projects to be further evaluated. The Domain Lead will notify all tenderers whether their proposals have been:

- Identified as suitable for further evaluation.
- Rejected/postponed. Justifications for the decisions to reject/postpone will be advised by the domain lead.

3.2.5 Formal Submission

Proposers of suitable projects will be invited to prepare a formal proposal using the ITP template, which will be made available on the MCM ITP website. This must include

- Firm price quote valid until March of the following year
- A detailed statement of work
- A breakdown of prices against the statement of work
- UK activities must be priced in Sterling
- French activities must be priced in Euros
- Existing projects will have to revalidate their price

The deadline for submissions is September.

Note: The individual domain leads can advise the timescales associated with their bid programme.

3.2.6 Compilation of proposals

MBDA will aggregate all of the formal proposals for submission to the MOD and DGA.

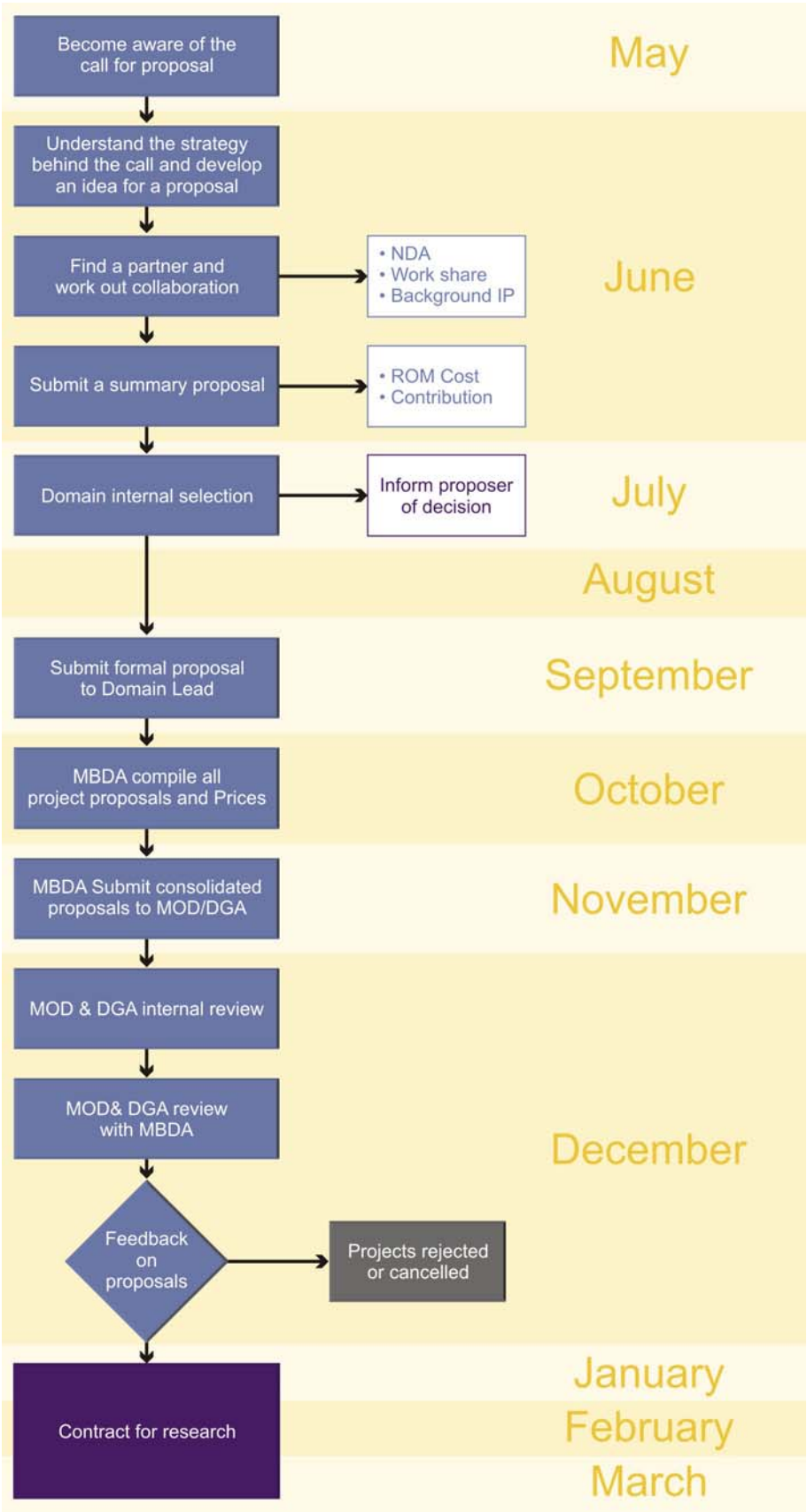
3.2.7 The Review Process

The customer will assess the proposals, prior to holding a technical review with MBDA.

It is intended that the final project selection will be endorsed by the ITP Management Board (constituting a single representative from MBDA, Dstl and DGA) by the end of December 2010. Once a decision has been reached, all proposers will be informed via their domain lead.

Depending on the priorities at the time; existing projects may be cancelled.

Note: Historically, some projects have been approved by December, whilst the decision on other projects has been delayed until March of the following year.


Become aware of the call for proposal
May
Understand the strategy behind the call and develop an idea for a proposal
Find a partner and work out collaboration
• NDA
• Work share
• Background IP
June
Submit a summary proposal
• ROM Cost
• Contribution
Domain internal selection
Inform proposer of decision
July
August
Submit formal proposal to Domain Lead
September
MBDA compile all project proposals and Prices
October
MBDA Submit consolidated proposals to MOD/DGA
November
MOD & DGA internal review
MOD& DGA review with MBDA
Feedback on proposals
Projects rejected or cancelled
December
Contract for research
January
February
March

3.3 Innovation Fund

The primary objective of the Innovation Fund is to rapidly fund the development of emerging research that might not otherwise attract funding from the main body of the ITP programme.

The prime consideration for project acceptance under this route is innovation that can be assessed in a short time-scale within a very constrained budget.

The Innovation Fund is intended to rapidly support the development of emerging research that might not otherwise attract funding from the main body of the ITP Tasking programme.

The Innovation Fund will be used to recycle MoD/DGA funding that would otherwise be:

a. Excess funds, paid under firm price, or

b. Customer funds not fully allocated to the Tasks and/or funds remaining from science provider tasks, which are not being continued in accordance with their planned completion date.

The funding will be targeted at small projects (20-40k€) supported by a streamlined approval system. The prime consideration for project acceptance under this route is low TRL, high innovation that can be assessed in a short time-scale.

The objective of the sponsored research will be to determine and address the main issues around feasibility. It is anticipated that a successful project concluding that the technology is feasible will result in a request for a larger study to be submitted into the normal ITP process.

Note: It is considered that few TRL1 ideas will make it to TRL2/3 and that a proportion of the research results will indicate that the concept is not suitable for larger scale research.

3.3.1 The Application Process

There are no restrictions on the date for submission of an Innovation Fund proposal. MBDA welcome proposals from industries, SMEs and academics.

As the budget for the Innovation Fund is nominal, it is advised that prospective tenderers contact MBDA procurement representatives to confirm that there is budget available, prior to preparing a proposal.

Note: Self-funding is not a requirement for proposal acceptance, however it will be considered favourably.

Table 1 provides a step by step guide to the application process. The Proposal must be submitted on the MCM ITP template published on the website

For further details of the terms and conditions, please request a copy of the Innovation Fund Request for Quotation from MBDAs procurement representative(s).

Step	Who	Activity	To Whom
Step 1	Tenderer	Submit 'Innovation Fund' Proposal (iaw template)	MBDA Procurement
Step 2	MBDA Procurement	Reviews Innovation Fund ' Short Studies' Proposal for compliance with template. Distribute Proposal for Peer Review	 Domain representatives
Step 3	Domain representatives	Conduct Peer Review of Proposal. Forward complete assessment to ITP Project Office representativies	MBDA Procurement ITP Deputy
Step 4	ITP Deputy (in conjunction with Domain Lead	Review Assessment and make decision to Accept/Reject Proposal • Rejected Proposal: Notify Tenderer of rejection • Accepted Proposal Allow 14 days for Consortium to object to proposal going forward	 Tenderer Tenderer
Step 5	ITP Procurement	Notify Tenderer of acceptance and prepare necessary information to place Contract	Tenderer

Table 3-1: Innovation Fund Process

3.3.2 Assessment Process

Your proposal will be assessed by representatives of the Domain with which the project is relevant. The time spent on assessment will be tailored to the value and complexity of your proposal. It is expected that the assessment will be fairly prompt.

The proposal will be assessed by representatives from the MCM ITP Community, including:

- Domain Lead
- Domain Representatives
    - Defence Science and Technology Laboratories (Dstl) Technical Point of Contact.
    - DGA Technical Point of Contact.
    - MBDA Technical Point of Contact.
    - MCM ITP Project Office.

All assessment data will be collated by the ITP Deputy and maintained on a database. If the assessment concludes that the project should be

funded, a copy of the proposal and a summary of the assessment will be distributed to all members of the ITP Consortium.

The MCM ITP Project Office will endeavour to provide a response to all proposals within 45 days of receipt of a compliant proposal.

4 Terms and Conditions

4.1 Funding and Contribution

The MCM ITP can only provide 50% funding to the cost of a project. The remaining 50% of the cost will have to be met by proposers.

Proposers will have to state if this contribution will be in the form of a contribution in kind or in cash.

Contributions In Kind (CIK) should represent a genuine cost; for example :

- provision of free hours from a member of staff.
- free use of facilities for which MOD/DGA would normally be charged.
- free use of software that would normally attract a licence fee, excluding capital investments.

In the past proposers have leveraged grants from other sources to meet this 50% contribution.

4.2 Quotes

All ‘Tasking programme’ proposals will need to provide firm price quotes that are valid until end of March of the following year.

All ‘Innovation Fund’ proposals will need to provide firm price quotes that are valid for two calendar months from date of submission.

All quotes will have to be broken down according to a template provided by the domain leads. The MBDA template for domains 1 and 8 is at Appendix B.

Prices should be against activities in the Statement of Work.

FIRM Price shall exclude VAT but include all other taxes, duties and other like charges that may be applicable

4.3 Intellectual Property

IPR terms can be found on the MCM ITP website.

In general IPR terms will flow down from the MOD/DGA when contract is awarded

5 Points of Contact

5.1 National Co-ordinators

Role	IPT Project Office	E-mail	Telephone
ITP Head	Andrew McBRIDE	andrew.mcbride@mbda-systems.com	+44 (0) 117 931 6328
Deputy	Amelie ROUVIERE	amelie.rouviere@mbda-systems.com	+33 (0) 1 71 54 18 83

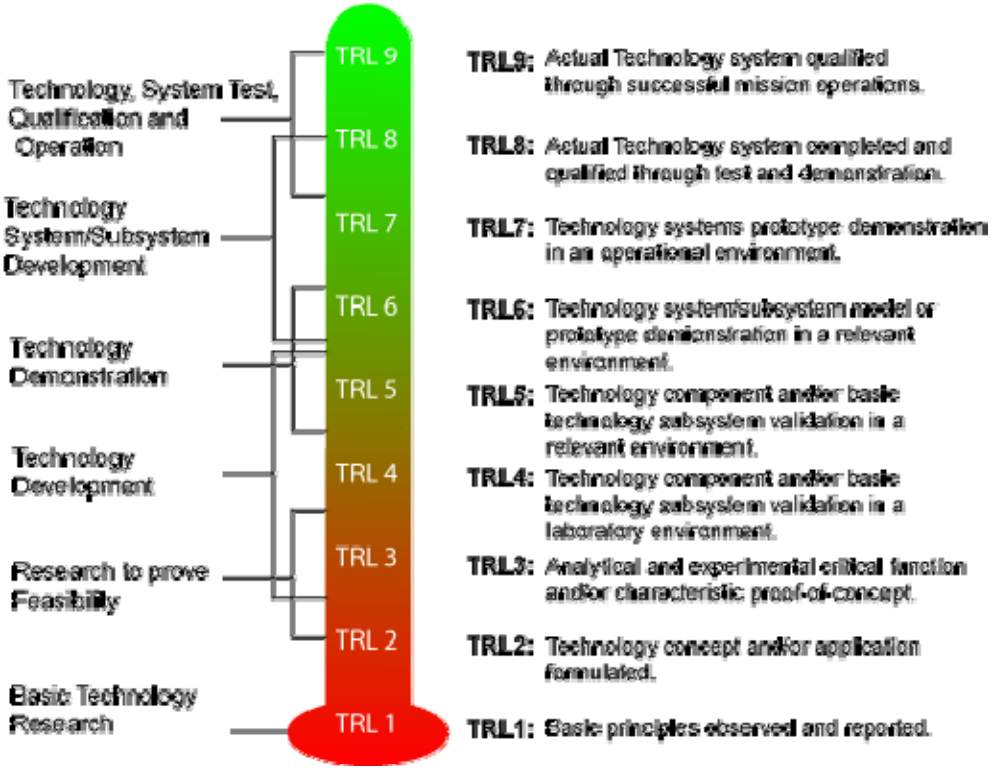
5.2 Commercial Queries

Role	IPT Project Office	E-mail	Telephone
Fr Procurement	Isabelle DALAGE	isabelle.dalage@mbda-systems.com	+33 (0) 1 71 54 31 90
UK Procurement	Glenn LEWIS	glenn.lewis@mbda-systems.com	+44 (0) 1438 756047

5.3 Domain Leads

Domain	Industry Domain Lead		E-mail	Telephone
1	Graham WALLIS	MBDA	graham.wallis@mbda.co.uk	+44 (0) 1438 755601
2	Antoine BRUS	THALES	antoine.brus@fr.thalesgroup.com	+33 (0) 1 34 81 56 15
3	Robert SHEARS	SELEX	robert.shears@selex-sas.com	+44 (0) 1268 887233
4	Roland FAVRE	ROXEL	r.favre@roxelgroup.com	+33 (0) 1 41 07 82 80
5	Jean-Francois RIDEAU	MICROTURBO	jean-francois.rideau@microturbo.fr	+33 (0) 5 61 37 78 57
6	Mike Firth	QINETIQ	mafirth@QinetiQ.com	+44 (0) 1959 514759
	Deborah Baricos	NEXTER	d.baricos@nexter.group.fr	+33 (0) 2 48 27 68 25
7	Richard CLUTTERBUCK	TME	Richard.clutterbuck@uk.thalesgroup.com	+44 (0) 1256 38 7214
8 (Elec)	Jean-Pierre BASSAT	MBDA	jean-pierre.basset@mbda-systems.com	+33 (0) 1 71 54 18 75
8 (Matls)	Azad HUSSAIN	MBDA	azad.hussain@mbda.co.uk	+44 (0) 1438 755220

Appendix A – Technology Readiness Level Scale



http://www.aof.mod.uk/aofcontent/tactical/techman/content/trl_applying.htm