

## Chairman's Address



The Defence Acquisition Reform Programme (DARP) is progressing, CAAS's Development Plan has just entered its second phase after a successful benchmarking study, the National Audit Office has just completed its review of Cost and Time Estimating across Government Departments, NATO's Life Cycle Costing Working Group is now on the homeward stretch with reports on generating Independent Cost Estimates due for completion at the end of the year and SCAF's workshop in February was one of the best attended for some time. Who said its been a quiet first quarter to the year!!

In February, the Secretary of State for Defence, Dr Liam Fox MP spoke at Civitas, the Institute for the study of civil society and announced that he was starting up a Major Projects Review Board. This would be chaired by himself as SoS and will receive a quarterly update on the MoD's major programmes to ensure that they are on time and within budget. This is in response to what he termed as "the most chaotic, most disorganised, most over-committed" budget he had seen.

This new Review Board would also bring to account Project Managers who have failed to deliver their programmes. He also referred to the continuing "conspiracy of optimism" and "failure to properly account for risk and realism in cost and time estimating".

Interesting then to see that the DE&S has just published the results of their annual benchmarking review that shows that their Project Managers are among the best in the world (conducted by an independent audit). By these two statements the inference is that CAAS's Cost and Time estimating is under even more pressure and expectations of improvement in cost analysis is now extremely high.

This then leads nicely into our theme for this years Annual Conference in September.

## SCAF 2011 Annual Conference

Our Annual Conference will be held on 20<sup>th</sup> September 2011 at the Royal Institution of Naval Architects, Victoria, London. The conference theme is "**Transforming and Improving Cost and Time Estimating for the next Decade**". Inside you can find details on the Call for Papers and I would encourage all prospective speakers to provide an early response to what will be a full and interesting programme.

## SCAF Workshops

Our workshops in February and April proved to be the most popular in recent years. With over 65 attendees at each event who not only sat and listened to the speakers but actively participated in lively debate on the major issues. Our thanks to all the speakers and attendees for making these such successful events. The presentations will be available to download from our website [www.scaf.org.uk](http://www.scaf.org.uk)

## Society Elections

It is time to start thinking about who you would like to run our Society. The Elections Committee is responsible for soliciting a list a qualified candidates for a membership vote. The election for 2011/12 will be for six (6) members of the management committee who will serve a two-year term of office. Nomination forms will be distributed in May for return by 30<sup>th</sup> June 2011.

## Future Events

Later in the newsletter we provide details on our planned events for the future. Please make a note in your diaries for those planned for 2011.

**Arthur Griffiths**

[Chair@scaf.org.uk](mailto:Chair@scaf.org.uk)

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## SCAF Workshop “Estimating the Cost of Operation and Support in a Changing Commercial World” – April 2011

The second of our workshops of 2011 was held at the BAWA Centre, Bristol and was attended by just over 70 delegates who participated in an excellent workshop and discussions around the principal theme for the day.

The UK provides an unique environment for the defence industry, one that is open to new procurement and contracting models including long term partnering arrangements that incentivise industry to drive down costs but allow increased profits that are earned by improving performance.

Since 2005 there have been many initiatives and statements claiming benefits through cost reduction and improvements to front line services.

Estimating for these partnering support contracts requires innovation, flexibility, agreed Key Performance Indicators and a high degree of emphasis on prioritisation by both parties.

Our speakers for the day included:

**Dale Shermon, Principal Consultant, Technical and Information Service, QinetiQ** “*Defence Acquisition Lifecycle Services – the Operating and Support Cost Analysis Model (OSCAM)*”. The presentation demonstrated the use of System Dynamics to model the relationships, behaviour and influences of the system in order to understand the O&S processes, O&S costs and interdependencies.

**Dr Stuart Wicks, Head of Business Analysis, Rolls-Royce – Submarines** “*Innovating the Value Proposition for In-Service Support – Flotilla Reactor Plant Support Contract*”. Stuart discussed the framework for transformation of the relationship between the MoD and Rolls-Royce Submarines. He covered the constraints, opportunities, working practice and the mechanisms in place to achieve the joint business objectives of reducing the cost of the submarine enterprise.

**Julian Gibbs, Senior Principal Consultant, BMT Reliability Consultants** “*The Challenges of Software Support Estimating*”. Julian spoke about the challenges faced in developing a cost model that would understand and quantify the costs of software support in order to identify the cost drivers to gain control of the support activities throughout the life of the programme.

**David Booth, Head of Risk and Opportunity Management, BAE Systems Mission Systems,** “*Developing a Risk Strategy for CLS Contracts*”. This presentation clearly showed that long term support contracts identified and had a different view on risk as opposed to development/production type contracts. The challenge was separating out cost uncertainty and risk for successful bidding and control throughout the programme.

**Dr Howard Lightfoot, Research Fellow, Cranfield University,** “*Partnership in Practice*”. Howard spoke on the challenges of Product Support Systems and the necessity to change organisational culture to deliver solutions. He illustrated this through some availability contracting examples. None were defence but were successfully achieving significant cost savings and front line improvement in product availability.

**Eric Phillips, Managing Consultant, Decision Analysis Services,** “*The JSF Programme – how much will it cost to own?*”. An interesting presentation and very topical in this climate of austerity. The analysis had been based on an approach that factored an compared JSF to existing aircraft support performance. It typified that the anticipated support costs for JSF will be significantly higher than originally estimated.

**Mark Hedges, Senior Consultant, BMT ISIS,** “*Sustainability in a Austere Time and Sustainable Procurement – a practical approach*”. Mark began by speaking about the ambitious public sector cuts, some wider issues and the challenges to address these wider issues whilst reducing expenditure. He then identified the key drivers of sustainable growth. This certainly hit the point and clearly identified the synergy between cost management and sustainable development.

An excellent workshop and thanks to all the speakers and the participants.

**Arthur Griffiths**

# 2011 Annual Conference

Tuesday 20<sup>th</sup> September

Royal Institution of Naval Architects

Victoria, London

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**Theme: “Transforming and Improving Cost and Time Estimates for the Next Decade”**

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## CALL FOR PAPERS

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The Comprehensive Spending Review published in October 2010 set out how the Government would carry out Britain’s deficit reduction plan. There was an urgent priority to secure economic stability at a time of continuing uncertainty in the global economy and put Britain’s public services and welfare system on a sustainable long term footing. The Spending Review made choices with particular focus to reducing costs and wasteful spending. As a result of these choices, departmental budgets have been cut by an average of 19 per cent over four years,

The ability to generate reliable cost and time estimates is a critical function necessary to support Defence expenditure. Without this ability, organisations are at risk of experiencing cost overruns, missed deadlines, and performance shortfalls—all recurring problems that project audit assessments too often reveal. Furthermore, cost increases and schedule delay often mean that the government cannot fund as many programmes as intended or deliver them when promised.

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Papers are invited covering a wide variety of cost estimating, cost analysis and cost management topics including:

- **Hardware and Software Estimating**
- **Costing Methodologies/Applications**
- **Affordability Assessment**
- **Earned Value Management**
- **Risk Analysis**
- **Cost Growth Analysis**
- **Decision Analysis**
- **Cost Benefit Analysis**
- **Balance of Investment**
- **Investment Appraisal**
- **Cost Management**
- **Benchmarking**
- **Organisation and Training**

Abstract submissions should be forwarded to Neil Morrill by 30<sup>th</sup> June 2011

Email: [ndmorrill@dstl.gov.uk](mailto:ndmorrill@dstl.gov.uk) Tel: 02392 537 271

## Are we just going round in circles?

**Mark Burdett** discusses whether a spiral development approach should replace a traditional approach to equipment development

In 2008, Bernard Gray was commissioned by the Defence Secretary to provide an independent review of the way the UK MOD buys equipment for Britain's Armed Forces. For several years leading up to the report, there had been reports of cost overruns and delays to high profile military programmes. In October 2009, the 'Gray report' was published. The contents filled the British press for several weeks and had far reaching implications to the way MOD and the UK defence industry meets its armed forces requirements.

One of his key findings was the need to improve equipment programme planning, management and delivery. Gray goes on to suggest:

*"...that the use of sensible processes such as 'spiral development' could be a way of improving programme delivery by reducing development risk and hence reducing cost overruns and delays".*

So what is the benefit of using a spiral approach to equipment development and should it replace a traditional linear approach?

Review of Acquisition for the Secretary of State for Defence. An independent report by Bernard Gray. Copyright Bernard Gray.

### Unmanned Aerial Vehicle Case Study

Spiral development, in the context of Unmanned Aerial Vehicles (UAVs), plans for the continuous improvement of a vehicles performance and capability over its lifetime. Where a more traditional "linear" or "waterfall" approach would prescribe the requirement up front, a spiral approach allows for the emergence and progression of requirements in an iterative manner.

To allow us to compare the merits of both development routes, we apply both a traditional and a spiral development approach to the same air vehicle with the same key dates and capability targets.



Defining the problem space ensures a like for like comparison and simplifies the analysis. To this end, both approaches will provide 20 unmanned aerial reconnaissance vehicles with similar operating characteristics between 2020 and 2060. To simplify the comparison further, we postulate that both vehicles are comprised of four sub systems: Airframe, propulsion, Synthetic Aperture Radar (SAR) and Infrared imaging (IIR).

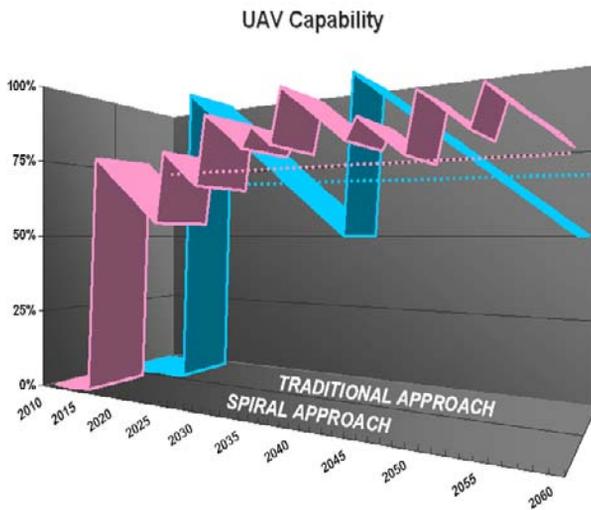
**Figure 1 – Example UAV**

Each of these systems can be defined by a simple key performance metric, in this case, Payload (Kg), Power (Bhp), Range (Miles) and Identification range (Miles) respectively. Operational Analysis allows us to define a realistic development plan for both options using these key performance metrics.

### Development Flexibility

For the traditional "linear" approach, the route map for each of the subsystems is simple. All four systems are developed in parallel for an operational date of 2020, with a second phase of development starting soon after for a second operational date of 2040. However, the spiral approach allows the four sub-systems to be decoupled and development activities to be driven by their own "natural" schedules considering their technology maturity. Further, there is synchronisation that allows dependencies between sub-systems to align that achieves overall integration but each sub-system can develop at it's own pace.

In military terms, capabilities erode due to the opposing forces creating countermeasures, altering their means of operating or improvements to their capabilities. The spiral development path allows for a constant upkeep in capability, with repeated increments in performance and thus equipment. This maintains a greater average operational capability over the period in question, see Figure 2. The traditional approach, however, provides a peak of capability at the operational dates that exceeds any value offered by the spiral approach but then declines over time until the next phase becomes operational. Over time the spiral approach offers a greater average level of capability that can be tailored if the need arises due to requirements changing, whereas the traditional approach relies heavily on the initial requirements being accurate and all encompassing, which does present a level of risk to the end user.



**Figure 2 – Capability through time**

The conclusions drawn from the previous paragraphs substantiate the statement made by Gray that a spiral development approach can in fact reduce a development programmes exposure to risk. But is this flexibility free?

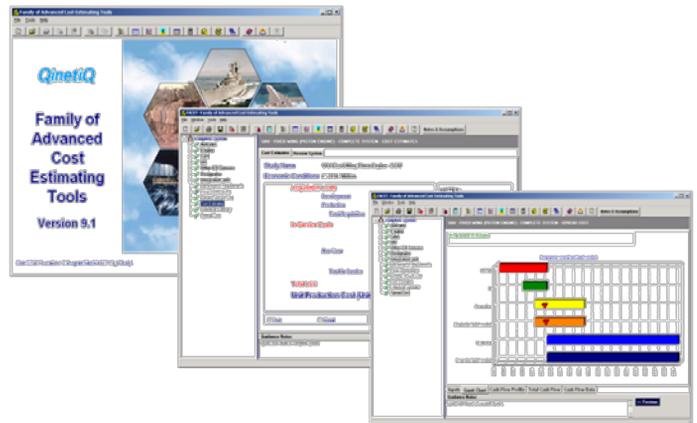
### The cost of flexibility

To understand the cost implications of the two approaches we need to cost both options over the whole time period. To simplify the cost analysis, a cost boundary can be derived that costs the development, manufacture and operational life of the UAV in question. Other costs associated with training, manpower and infrastructure have been considered but not included in these cost estimates.

QinetiQ’s Family of Advanced Cost Estimating Tools (FACET), see Figure 3, has the unique capability of producing parametric cost estimates based on performance parameters. Aligning the Key Performance Metrics with the tool’s inputs and using the derived development paths, generates a parametric cost estimate for the life cycle of the approaches.

When the UAV results are produced on an equitable basis using FACET it is possible to observe the spiral development approach costing 15% more than a traditional approach. This is driven by a doubling of the manufacturing cost to facilitate the constant upgrading of equipment to refresh the capability. Even though these upgrades are in small increments, each increment has its own life cycle and associated costs, which overall is slightly less efficient than the traditional approach.

**Figure 3 – The FACET toolset**



### Delivering Capability

These inefficiencies are more pronounced when considering the total management effort relating to the delivery of an operational capability. By comparing key programme milestones (see Figure 4), it is clear that when commissioning and decommissioning equipment, the spiral approach is less efficient. Each new equipment or upgrade requires testing, trials and training to be conducted successfully before it is released into service. For the traditional approach, this only occurs twice but the spiral approach requires a continuous commissioning and decommissioning effort throughout the lifetime. This therefore requires an additional level of management, which will ultimately cost money. However, in some instances, these milestones or events can be seen as a benefit. Unlike the traditional big bang approach, where a large team is assembled and then disbanded once the project is complete, the spiral approach focuses a team to continually improve the system over the whole life of the system. This also improves skill retention and workforce continuity.

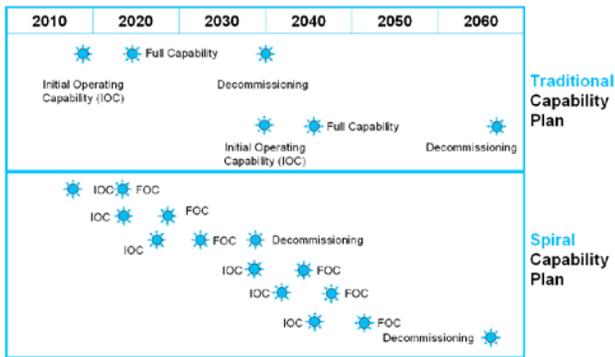


Figure 4 – comparison of plans

### The trade offs

This analysis has shown that using a spiral development approach improves the flexibility of a programme and thus reduces the risk associated with requirements change. However, this reduces the efficiency of delivery, by increasing the management overhead and the overall cost of the programme. Nevertheless, several other benefits also accrue from having a consistent delivery team that are hard to quantify, for example skills retention, which must be taken into account to understand the total picture.

This short paper has only focused on a few of the factors that influence the choice of approach; in the real world, there are others that should also be taken into account. As each programme will be unique, the level of importance given to these factors will change. Unfortunately, there is no hard and fast rule as to which approach offers the best “value for money” and many of the factors need to be understood before an approach is chosen. So, to answer the original question posed, the spiral approach should not always replace the traditional approach; intelligence needs to be applied before a route is chosen.

### The author

Mark Burdett is a senior consultant with QinetiQ and has been working in the defence industry as an analyst for 10 years. He has supported the Ministry Of Defence on project approvals in the Air, Land and Sea domain and provided analysis support to BAE Systems, QinetiQ, Thales and Augusta Westland. He is accredited by the Association of Project Managers (APM) and PRINCE 2 and has a Masters in Electrical and Electronic engineering from Loughborough University.

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## SCAF Mailing Distribution Changes !!

We are in the process of updating and improving the email distribution that provides notification and registration of future SCAF workshops and Events. The new system will allow new prospective members to subscribe to the mailing list whilst also providing an unsubscribe facility.

During this transition process all those on the current mailing list will be transferred automatically and some may receive message from [Subscribe@scaf.org.uk](mailto:Subscribe@scaf.org.uk) to register separately via a provided hyperlink. This will ensure that details will not be held anywhere other than the dedicated SCAF domain.

We ask for you patience during the transition and, in the first instance, we will duplicate this with the current distribution system to ensure continuity.

# 2011 SCAF Committee Elections

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It is time to start thinking about who you would like to run our Society. The Elections Committee is responsible for soliciting a list of qualified candidates for a membership vote. The election for 2011 will be for six (6) members of the management committee who will serve a two-year term of office.

The requirements for being a committee member include:

- Being a member in good standing (membership dues must be current at all times)
- Attending the committee meetings
- Supporting the Society by performing special activities as directed by the committee

In addition to meeting these requirements, qualified candidates must submit a completed nomination form suitably supported by a proposer to the returns officer at the address shown on the form. The nominations form will be mailed to all members and will also be available on the SCAF website.

The elections committee has established the following schedule for conducting the 2011 elections:

<b>Initial Nomination Period</b>	<b>Opens 12<sup>th</sup> May, Closes 30<sup>th</sup> June</b>
<b>Review Nominations</b>	<b>1<sup>st</sup> July</b>
<b>Ballot Distribution</b>	<b>22<sup>nd</sup> July</b>
<b>Voting Period</b>	<b>Opens 25<sup>th</sup> July, Closes 30<sup>th</sup> August</b>
<b>Committee Announcement</b>	<b>20<sup>th</sup> September 2011</b>

## SCAF Workshop: “The Use of Parametrics for Cost and Schedule Estimating” – are we making best use of it? – February 2011



February saw the first SCAF workshop of the year and what an attendance it drew. The venue was BAWA Bristol and the theme was very topical and generated huge interest and debate during the day.

The opening presentation was given by **Steve Smith** (MBDA), **Dr Mark Gilmour** (QinetiQ) and **Dale Shermon** (QinetiQ) who described the use of whole life cost model parametrics. Cost Estimating Relationships were considered at “micro and macro levels”, an important part of the discussion focussed on how to consider the right level parametric. The presentation considered future and existing contracts of a defence supplier and looked at net present value and measures of effectiveness in this context.

This was followed by **Dr Spencer Woodford** (Burchelli Consulting) who had examined the significant considerations in developing Parametric Cost Estimating Relationships. He stated that consideration should be given to the relationships between input parameters and cost from an engineering perspective on the basis that a statistical point of view (e.g. R squared) is just one quality statistic. Consideration in error is the actual units of the error - is it absolute or percentage error? Users of models should know their models' limitations.

**Georges Teoglou** (PRICE Systems) then spoke about the issue of parametrics in general and whether we are making best use of parametrics. A solution should determine an investment in parametrics over many years. There were other aspects of cost engineering such as cost control and Earned Value Framework that could be used in conjunction with parametrics as part of the wider scope of the Cost Engineering framework. Good estimation should consider both analytical and top down solutions.

The morning session was summed up by **Jason Dechoretz** (MCR International) who spoke about the use of parametrics when considering issues such as systems of systems, a portfolio of models, linking Technology Readiness Levels (TRLs) to cost, and trade-offs occurring through Cost As an Independent Variable (CAIV).

The afternoon started with a discussion by **Phil Wardle** (BAESYSTEMS) on the pre-requisites for parametric modelling and the information required and how it should be best used.

**Emily Braund** (BAESYSTEMS) then highlighted the issues and techniques adopted to develop Target Costs and the use of establishing a “Price to Win”.

**Andy Langridge** (PRICE Systems) spoke on using uncertainty and risk with parametric tools and evoked much discussion on the application.

**David Simms** (Galorath International) highlighted the need to think about schedule as well as cost when conducting parametrics. He described how they can serve as repositories of knowledge but noted that humans are hardwired to be optimists.

The Plenary Session and the workshop was facilitated by **Eric Phillips** and our thanks go to all the speakers for their contribution to an excellent workshop.

*Dr Paul Baguley, Cranfield University*



Eric in action

## Future Events

### SCAF Workshops and Seminars 2011



**07 Jun 2011** “**Estimating for Collaboration and Partnerships**”, Aston & Lea Golf Club, Preston, Lancs. The workshop will compare and discuss the various estimating requirements necessary to support the bidding and negotiation processes.



**28 Jun 2011** **SCAF Summer Reception**, The Steam Railway Museum, Swindon, Wiltshire. This event will provide an opportunity for friends and colleagues to get together in an informal environment. Buffet Lunch and Refreshments will be provided.



**20 Sep 2011** **Annual Conference**, Royal Institution of Naval Architects, London. Our annual conference offers a wide range of topics and, over the years, has provided a platform for innovative speaking and thought gathering.



**2-3 Nov 2011** “**Joint Conference**”, The Ricoh Stadium Conference Suite, Coventry. The UK Association of Cost Engineers (ACostE), the Society for Cost Analysis and Forecasting (SCAF) and the European Aerospace Cost Engineering Group (EACE) are delighted to announce this joint conference to support the ACostE’s 50th Anniversary.

### Other Related Events

**Networking  
for the Cost  
Estimating  
and Analysis  
Community**

**11-12 May 2011** **European Aerospace Cost Engineering (EACE) meeting**, ESTEC, Noordwijk, The Netherlands. Further details available from [EACE@hotmail.co.uk](mailto:EACE@hotmail.co.uk)

**07-10 Jun 2011** **ISPA/SCEA Joint Conference and Training Workshop**, Albuquerque, New Mexico, USA. Further details from the SCEA and ISPA Joint Office 703-938-5090 or [SCEA@sceaonline.org](mailto:SCEA@sceaonline.org) or [www.ispa-cost.org](http://www.ispa-cost.org)

**SCAF is not responsible for the content of any external websites published in this Newsletter.**



**Bridging relationships  
in cost estimating**

For over 20 years the Society has sought to illuminate key issues in the analysis and forecasting of project costs—and to promote best practice within the cost forecasting community.

The Society provides a single point of contact for advice to those wishing to address key issues in the analysis and forecasting of costs and timescales of complex programmes.

Workshops and seminars are held at regular intervals throughout the year. A newsletter is published electronically 3 times a year.

Collaborative links with other societies has always been maintained and a library of relevant papers are available. A single annual payment entitles members to attend the all the years' programme of SCAF events. The Summer Reception is provided free to SCAF members and their guests.

SCAF is committed to providing Continuing Professional Development through the provision of its skills workshops and its support to Professional Development courses.

The Society therefore continues to provide members with exceptional value for money.

## SCAF Committee Members and Contact Details

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