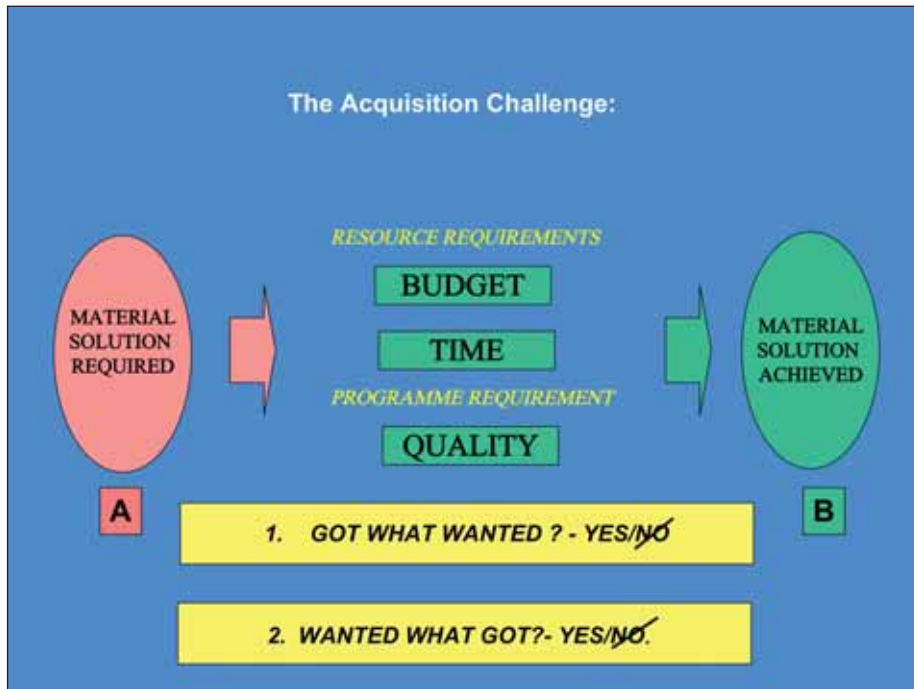


System Life Cycle Management in NATO – Challenges and Results

System Life Cycle Management is a term gaining recognition in the world of acquisition. It originates from the civil standard ISO/IEC 15288 (International Standards Organisation/International Electro technical Com-



The acquisition challenge in materiel management.

All illustrations: author

approach should be part of the work of the armaments community in NATO. In 2003, a CNAD reorganisation led to the introduction of a “Life Cycle Management Group” in the CNAD structure to spearhead the adoption of the life cycle approach. The first action of this group was to bring the concept of System Life Cycle Management to NATO nations by inviting the North Atlantic Council to support a NATO Policy for System Life Cycle Management, this policy stating that ISO/IEC 15288 was to be the basis for the development of the life cycle approach in NATO capability development. The benefit of this approach that armament directors were particularly keen to realise was to be better informed on the life cycle costs of a system in the decision making process.

Why System Life Cycle Management and Why in NATO?

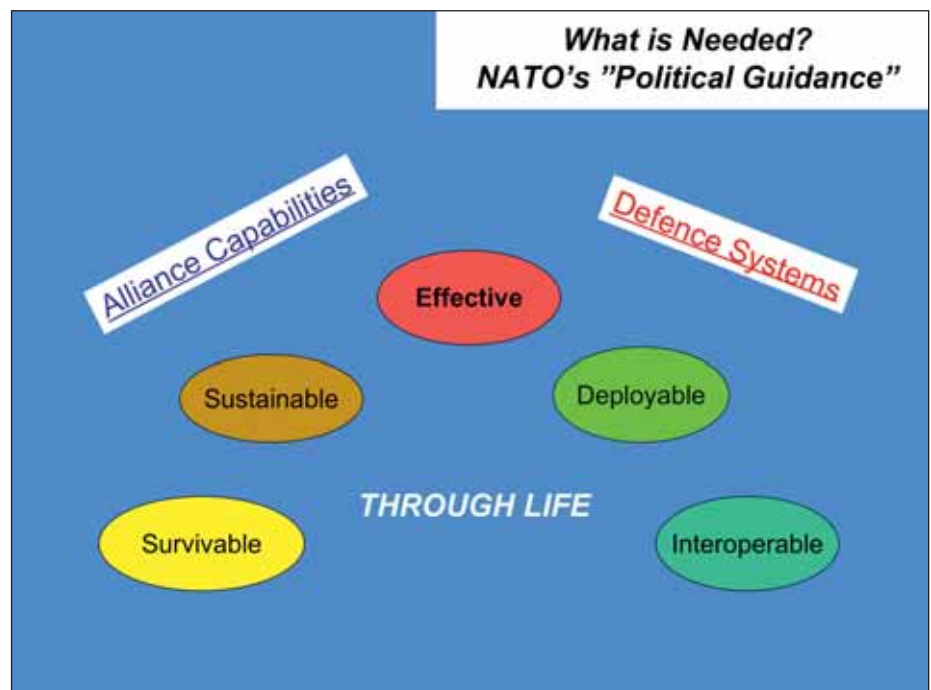
Agreeing a policy and establishing a group of experts was but a first step in introducing new thinking or initiatives in NATO. NATO is a large and diverse organisation engaged in priority operational tasks and with many demands on resources. NATO nations, too, are in similar circumstances. The challenge for new ini-

mission 15288) on Systems Engineering – System Life Cycle Processes. Abbreviated to ‘SLCM’, System Life Cycle Management is a working methodology for programme managers to achieve a systematic and integrated approach to addressing the life cycle of a system-of-interest in programme implementation.

The need for a systematic, integrated, approach to system acquisition became apparent in the 1980’s in the civil sector when delivering software driven systems. It became clear that it was important to have a thorough understanding of the life cycle needs of a system, both at the outset and during its life. Without this, system performance through life was unlikely to meet the expectations of the user. To ‘make good’ a system in use implies spending more money on the system than was intended. Paying to ‘make good’ a system is also spending money on what is owned and not on new needs.

SLCM Background in NATO

In NATO, the life cycle approach was brought to the attention of the Conference of National Armament Directors (CNAD) in a 2000 report. Armament Directors agreed that the life cycle



NATO's allied capability requirements.

Government Need

- “Acquisition of defence systems/equipment
 • to REQUIRED PERFORMANCE AND QUALITY
 • in a TIMELY manner
 • and TO BUDGET”



Defence procurement objectives as set out by the governments.

tiatives is to show that they contribute to the priorities of the organisation and this is no less so for a life cycle approach to defence system acquisition. The challenge for the SLCM initiative is to establish SLCM in NATO nations and in NATO programmes, beyond the converted experts. In addressing this challenge it is necessary to be clear about the results expected. Two questions need to be answered – what results are offered by adoption of SLCM as set out in ISO/IEC 15288? – and, what results are we seeking in the NATO context?

Taking the first question – what results are offered by adoption of SLCM? A successful programme can be summarised as one that uses provided resources to produce an affordable material solution that meets the capability need. SLCM, as presented in ISO/IEC 15288, is intended to provide a programming methodology and a process architecture to ensure that the right solution is both being asked for and is being delivered in the right way.

The response to the second question – what results are we seeking in the NATO context? – must start from the top level of NATO’s guidance. NATO’s agreed Comprehensive Political Guidance calls

for defence systems that provide for the Alliance military capabilities needed to conduct operations. These Alliance capabilities, and the defence systems that contribute, should be effective, deployable, sustainable, survivable and interoperable. Implicit with this is that these qualities must be affordable to procure and af-

fordable through-life. The importance here is that, if the through-life condition is ignored, the risk is that the effectiveness of the defence system and therefore the capability it supports, will be compromised when it matters most, namely in the field of operation.

The “capability approach” to defining Alliance military requirements seeks to encompass the spectrum of needs, or elements, that make up a realisable capability, of which material, in the form of defence systems, or equipment, is one. These elements are summarised in the acronym “DOTMLPFI” (Doctrine, Organisation, Training, Material, Leadership, Personnel, Facilities, Interoperability). The similarity between the capability approach and SLCM is that both are addressing the through-life dimension in the totality of what is delivered. The first is about a ‘living’ and useable capability; the second about a ‘living’ and useable defence system contributing to capability. SLCM provides a methodology, able to be tailored to specific programmes and needs, NATO or national, to deliver defence systems that support required capabilities.

A further point of importance concerns the last attribute in the capability acronym, Interoperability. Achieving NATO interoperability is a complex challenge in itself. However, in the area of defence systems, nations working together on multinational programmes, or using common methodologies and guidance in national programmes, is an avenue to interoperability in the systems and equipment domain. It could also be argued that these two go togeth-

System Life Cycle Management in NATO – Scorecard

CHALLENGES SET IN 2000	ACHIEVEMENTS TO DATE
A Senior Management Committee (SMC) for Life Cycle Management in NATO	CNAD - LCMG
Clear vision endorsed by NATO top management	NATO Policy for SLCM
A team to investigate the use of ISO/IEC 15288	Policy linked to ISO/IEC 15288
SMC to set priorities for introducing LCM in NATO	Yes
A team to develop a set of LCM guidelines: – tailoring ISO 15288 - Revise PAPS - Guidelines – LCC, etc.	AAP-48 AAP-20 Ed 2 ALCCP, etc..
SMC organise training and workshops on LCM	Annual ‘LCM in NATO’ Conference
SMC seek the implementation of LCM products in Pilot Programmes	First underway
SMC monitor new developments in technology and business management.	Ongoing support by the NATO Industrial Advisory Group

SLCM in NATO – results and perspectives.

er. Using common methodologies and guidance amongst nations facilitates nations being able to work multinational programmes. To which may be added that multinational programmes are of growing interest amongst nations as nations seek ways to provide new capabilities when national defence budgets are under continuing pressure.

In summary then, NATO needs 'through-life' capabilities, integrated and harmonised across nations to be both effective and efficient. SLCM offers the programme methodology and process architecture to deliver defence systems able to meet through life capability requirements. Adoption of the civil practice presented in ISO/IEC 15288 offers the opportunity for NATO nations and NATO to align with best practice in acquisition programmes and to work together in multinational programmes.

The System Life Cycle Management Challenge

The NATO Policy on SLCM states that "the aim of Systems Life Cycle Management is to optimise defence capabilities taking into account performance, cost, schedule, quality, operational environments, integrated logistic support and obsolescence over the whole life cycle". These are well crafted words that present a real challenge to those charged with implementing the methodology and processes of SLCM. This is particularly so in governments where the goal is to achieve the acquisition of defence systems and equipment to required performance and quality in a timely manner and to budget.

The process approach of ISO/IEC 15288 is based on high level processes, namely agreement processes, project enabling processes, project processes and technical processes. Within each of these process areas, implementation processes provide the direction for the work required. In government, acquisition practices address the same areas, but not necessarily with the methodology and life cycle approach of the ISO/IEC 15288. Industry meanwhile provides a more ready market for the ISO/IEC processes methodology, with business costs and product delivery requirements the prime motivators.

In acquisition terminology, these through-life needs are translated into acquisition requirements – performance, quality, operational environments, integrated logistic support, obsolescence. Programme cost and schedule complete the picture. SLCM applies the system-of-interest acquisition requirements to the 'System Life Cycle' by means of the processes methodology. In other words, SLCM is about applying system engineering to acquisition programmes through an organised processes methodology with the aim of delivering systems 'fit for purpose' through life.



ISO/IEC 15288 process architecture.

SLCM Guidance Development in CNAD

The ongoing work in the CNAD is to provide the SLCM implementation 'tools' in the form of guidance documents that link acquisition requirements to the system life cycle. This is very much ongoing work with a life cycle of its own. It is sustained by experts from nations, who bring to the NATO table national and international practices. It is also supported by industrial experts through the NATO Industrial Advisory Group, who advise on industrial best practices and experience in SLCM.

Since starting in 2003, the work in the CNAD Life Cycle Management Group has been to develop the "tools", in the form of guidance documents, to support the implementation of SLCM in NATO. Two framework publications have been developed, these tailoring the ISO/IEC 15288 standard to nations and NATO defence programme needs. The first, "NATO System Life Cycle Stages and Processes", sets out the 'NATO Life Cycle' and establishes a common framework for describing and implementing life cycle management for NATO defence related capabilities. The second revises the CNAD "Phased Armaments Programming System", as developed in the 1980s, to provide a programme management guidance orientated to the "NATO Life Cycle". Particular attention has been given to the subject of life cycle costs. A general guidance on how to address life cycle costs was published in 2008 and detailed methodologies for determining life cycle costs as being examined in the NATO Research and Technology Organisation's Systems Analysis and Studies Panel. The most recent publication produced by this Panel being a 'Code of Practice for Life Cycle Costing'.

Results

In the seven years since the CNAD, through the Life Cycle Management Group, set out to adopt the 'life cycle' approach, significant progress has been achieved. The "SLCM in NATO" scorecard shows positive results in placing SLCM on the NATO agenda at senior level, linking the NATO approach to the ISO/IEC 15288 standard and developing a set of SLCM guidelines. However, like all NATO initiatives, SLCM must provide benefit to the NATO member nations and align with their needs. This implies that the SLCM policy, guidelines and approach is adopted in national programmes, multinational programmes and those led by NATO agencies. A recent survey amongst NATO nations indicated that SLCM, as a concept, is being adopted in the majority of nations, but at a pace dictated by national prerogatives.

For SLCM to gain ground in the practice of programme management and systems engineering, communication, understanding and involvement are required and at all levels. A contributor to this is training and SLCM training is being developed in academia, government and industry. It is viewed as the next step to address in NATO.

As the American missionary Walter Elliot is quoted as saying "Perseverance is not a long race. It is many races, one after the other". In NATO the important consideration is that nations are racing to the same finishing line. ■

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