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Rising Challengers on Global Defence Markets



“NATO 3.0” as a Global Player

The dynamism of NATO’s evolution has enabled the Alliance to maintain a position that is unequalled across the whole international security architecture.



Elements for Enhanced Infantry Firepower

Armament concepts have become more complex: they focus on modularity. “Infantry toolboxes” therefore contain a wide variety of components.

Life Cycle Management and Standardisation in NATO

The Long Road to Greater Interoperability and Cost Efficiency

Peter Janatschek

The development, production and operation – including logistic support – of complex international projects has always placed great demands on all involved. The required operational capabilities have to be achieved on budget and within specified time frames. This is as true today as it has ever been.

Concepts such as Life Cycle Management (LCM), Integrated Logistics Support (ILS), Life Cycle Integration (LCI) and Continuous Acquisition and Life Cycle Sup-

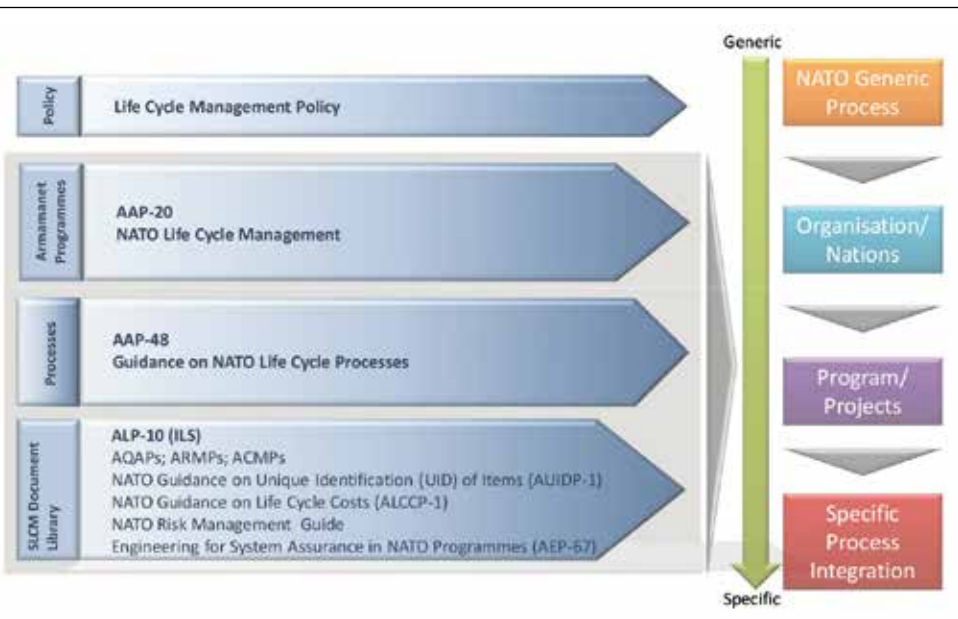
ported and tested functional standards for processes, on data standards for information and on technical standards for the underlying information technology.

portation, LCM is the basic strategy for the optimisation of logistics processes, and it allows effective and integrated logistic support to be provided to complex systems in the existing fields of e-commerce, supply chain management and electronic technical documentation.

Objectives and Tasks

In 2000, the Conference of National Armaments Directors (CNAD) discussed the concept of LCM for the first time. It was decided to implement this approach in future NATO armaments projects. In 2003, restructuring of CNAD resulted in the creation of Alliance Committee 327 (the Life Cycle Management Group, LCMG). This group is responsible to the restructured CNAD and is tasked with implementing the life cycle approach. The group's first action was to develop the concept of the Life Cycle Management system and pass it on to the NATO nations. The draft concept was presented to the North Atlantic Council with a proposal to approve it as NATO's political guidelines for LCM systems. The document was published in 2006, with the title NATO Systems Life Cycle Policy. It said that the NATO life cycle approach based on ISO/IEC 15288 ("Systems and Software Engineering – System Life Cycle Processes") should be developed and form the basis for NATO's future capability development.

Today, over 20 NATO nations actively assist the activities of AC/327 and its working groups. When Secretary General Jaap de Hoop Scheffer put his signature to it in January 2006, and the North Atlantic Council thereby practically declared LCM to be a key focus, it only fuelled further interest in it. In addition to the far-reaching organisational changes, there are also a number of other decisions and measures that will contribute to restructuring logistics in NATO, and which will increase its effectiveness. These include an integrated approach to the logistic processes of a product throughout its entire life cycle in terms of a systematic NATO LCM process for the defence sec-



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NATO SLCM framework

port (CALS) have, for many years, defined an integrated approach to logistics processes, including related information, over the entire life cycle of a system or product. In particular, CALS, the prominent global strategy of the 1980s, is based on reliable,

CALS was originally a NATO initiative, building on the experiences of the US Defense Department. It is an integrated data environment, characterised by its use of the best commercial technologies, processes and standards for production and management, and for the exchange and use of business and technical information in industry and management. Since 2000, NATO and its member nations have been guiding their activities towards Life Cycle Management and Life Cycle Integration, without questioning their original objectives. In industry, and in public adminis-

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tor. Furthermore, the Phased Armaments Programming System directive, written in the 1980s, is being updated with a view to providing guidance for the management of armaments programmes in the NATO life cycle. There is special emphasis on the areas of Integrated Logistic Support (ILS) and Life Cycle Costs (LCC). In addition to a variety of NATO publications, a number of important new guidelines and procedural instructions have been updated and published, which build on ISO/IEC 15288. They include:

NATO Guidance on Integrated Logistics Support for Multinational Armament Programmes (Allied Logistics Publication 10, ALP-10), NATO Guidance on Life Cycle Costs (Allied Life Cycle Costs Publication 1, ALCCP-1), NATO Risk Assessment Management Guide (Allied Risk Assessment Management Publication 1, ARAMP-1).

The aim is to provide everyone involved in the life cycle of a project, system or product – from the developer to project managers, users and logistics experts – with recommendations and guidelines so that they can develop, implement and use it on time and within budget.

Integrated Logistic Support

In the ILS process, all logistic considerations and measures relating to the product are brought together in an integrated approach. ILS supports the aim of minimising the life cycle costs of new and existing products/systems and modifications. The idea is that all the information needed to ensure the timely delivery of logistic support be made available simultaneously to all agencies involved, promptly and with the right level of detail.

The overriding objective of ILS is therefore the cost-efficient delivery of defined logistic and operational requirements for a product throughout its life cycle. In terms of establishing and maintaining operational readiness for all elements of logistic support, it is therefore important to take cost-efficiency into account at an early stage, when planning, procuring, and/or providing ILS elements.

The application of internationally recognised standards, which support a process-oriented approach and procedures, is crucial, in particular with regard to the introduction and use of standard application software.

ILS Objectives: Case Study Bundeswehr

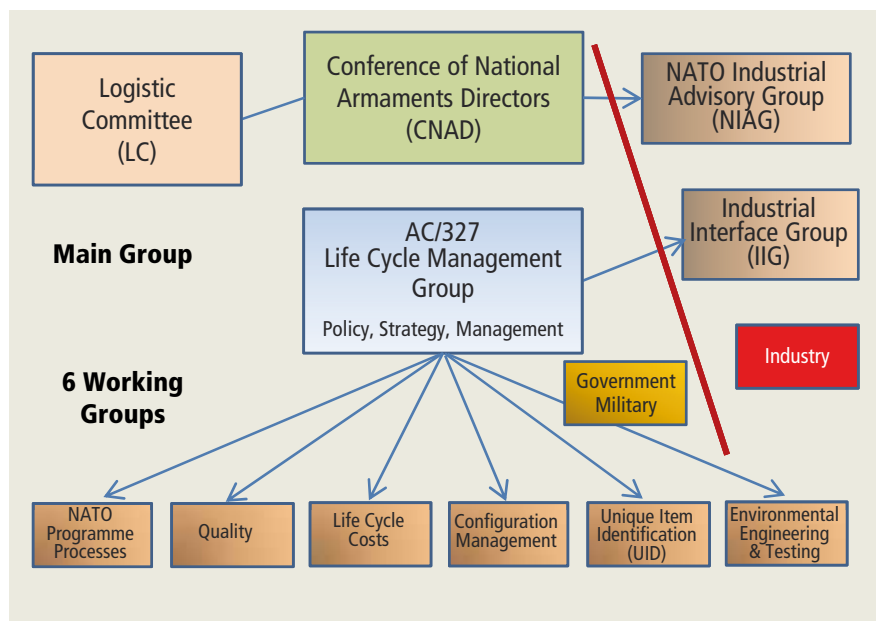
In complex projects, such as defence projects, it is important to manage project ele-

ments in the form of different tasks. CPM (Customer Product Management) dictates that the entire life cycle of weapon systems be taken into consideration in this process – from initial analyses to implementation, to the utilisation phase (which can be very long) to its ultimate reclamation. Logistics is one of the most challenging elements of a project.

For weapon systems in particular – which are becoming increasingly complex and have ever-longer service lives – costs during the in-service phase (e.g. operation, maintenance) are becoming increasingly important. The logistic support required for

Design, Development and Implementation of “S-Series of ILS Specifications”

Over the past 25 years, considerable effort has been invested – particularly in the aerospace and defence industries – in developing, harmonising and agreeing data standards and specifications in the field of ILS. Work in the field of ‘technical documentation’ and ‘materials management’ began as far back as 1988. The foundations for data standards and specifications were laid in 1993, during an international NATO workshop in Paris. Participants



SLCM work structure

such systems is developed in parallel with implementation of the weapons system. Increasing multinational collaboration and greater cooperation between industry and the military is helping leverage synergies. The timely delivery and smooth exchange of data and information between project partners is essential.

The development and upgrading of data standards and specifications and their implementation and application is a basic requirement, in order to ensure the delivery of efficient IT support and the interoperability of the project partners' various IT systems throughout the entire life cycle of military equipment. These data standards and specifications lay common foundations for providing clear information, with defined and comprehensible syntax and semantics. They are intended to facilitate the automated exchange of logistic data between manufacturers and users. They therefore contribute significantly to the quality of the master data in the Bundeswehr's logistics system.

developed functional content and ideas about the interplay with ILS specifications. Over the years, various Memoranda of Understanding established cooperation between the industrial associations of the ASD (Aerospace and Defence Industries Association of Europe), AIA (Aerospace Industries Association of America) and ATA (Air Transport Association of America). A number of ILS specifications are now freely available online (e.g. www.sx000i.org) although some are still partly in development.

Organisation and Operations of the AIA/ASD/A4A Community

Specifications are developed by international working groups, comprising manufacturers, operators, and users. Once a specification is published, a steering committee assumes responsibility for maintaining and updating it. The ILS Council oversees the coordination and coopera-

tion of the working groups and steering committee; this work is a cooperative effort between industry, operators and users. Participants are representatives from industry and national ministries, including agencies from Europe and the USA.

Germany is represented in these bodies by industry and, as a user, by the Bundeswehr. Germany is an active participant and also chairs some of these committees. The international ILS specifications are used as the basis for creating detailed rules for implementation and guidelines for their application. This task is carried out by national working groups with members drawn from the Bundeswehr and German industry.

The "Specifications and Standards" department within the Bundeswehr's logistics detachment leads these working groups and is responsible for implementing the ILS specifications in national guidelines and regulations. At an international level, the department represents the Bundeswehr's interests in the formulation/development of ILS specifications. At the same time, real, practical experience – gained through providing advice and technical assistance in the application of ILS-specifications – can be directly fed into the bodies at national and international level.

"Technical Documentation" is one of these elements of ILS. It includes the formulation, cultivation and provision of

all the technical and logistic information needed to prepare the basic equipment for a product that is to be introduced.

Recent Developments

In August 2013, the IIG decided to introduce the ASD/AIA specification S1000D, "International Specification for Technical Publication Using a Common Source Database", to NATO and propose it as a standardisation recommendation (STANREC). The aim of this move was to take a specification – from the field of ILS and, more specifically, the ILS element of technical documentation – that was internationally established, recognised equally by the military and civilian industry, and that had been in use for some time, and to introduce it to NATO as a recommendation.

After this recommendation was presented to – and approved by – the nations in NIAG and the AC/327 in January 2014, and was then also checked in detail by the relevant AC/327 working group, it received final approval from AC/327 and all NATO nations involved. Following approval from the ASD Specification Council in April 2014, the document was approved by the NATO Standardisation Office in June 2014 as STANREC 4752 TECHNICAL PUBLICATIONS USING A COMMON SOURCE DATABASE (S1000D) and published on 2 October 2014.

Conclusion

The increasing complexity of systems and projects, rising costs and time pressure for implementation, combined with the significantly longer service life of equipment led to increasingly insistent demands for an efficient and universal LCM system, based on recognised civilian standards, data standards, and functional standards.

In this context – and with the realisation that complex systems and projects are increasingly only implemented at a multinational level – the 2006 decision by NATO nations to introduce systems life cycle management on the basis of ISO 15288 was only logical. The emphasis on integrated logistics support and life cycle cost management has highlighted other important, related, priorities. Consequently, NATO's internal organisation has also been adjusted. NATO's Life Cycle Management Group – Allied Committee (AC) 327 – and the working groups (which currently number six) have created an organisation that implements ISO 15288 in NATO guidelines and recommendations, and that only formulates NATO-specific regulations where it is absolutely necessary.

With this detailed work, it is of paramount importance that the aim – wherever possible – be to implement robust, recognised civilian standards: data standards in IT support and functional standards in the field of logistic support.

In the field of ILS, there is a comprehensive package of specifications available, in the form of the "S-Series of ILS Specifications", which was developed by civilian and military specialists over several years, in close collaboration with users. These specifications are in various stages of development. S1000D and S2000M are both worth particular mention. They have proven robust for some years and have been implemented in a range of multinational projects and programmes and applied in practical schemes.

By recommending the use of ASD/AIA/A4A S 1000 D in the NATO ILS element "Technical Documentation", NATO has taken the first step on the long road to an effective life cycle management system and greater standardisation. In turn, this will lead to greater interoperability and cost efficiency. It is to be hoped that this is the first step of many. Now, the experts at ASD and AIA/A4A need to complete the specifications that are currently a work in progress. However, software developers must also take ownership of this issue and develop tools that, on the one hand, meet the specifications and, on the other hand, fulfil user requirements so that operational requirements can be delivered on time and cost-effectively, thereby supporting software over its entire life cycle. ■

Products of the "S-Series of ILS Specifications"		
SX000i	International guide for the use of the S-Series Integrated Logistics Support (ILS) specifications	Draft 0.1
SX001D	Dictionary for the S-Series ILS specifications	in process
SX002D	Common data model for the S-Series ILS Specifications	in process
S1000D®	International specification for technical publications using a common source database	Issue 4
S2000M	International specification for materiel management-Integrated data processing	Issue 5
S3000L	International specification for Logistics Support Analysis – LSA	Issue 1
S4000P	International specification for developing and continuously improving preventive maintenance	Issue 1
S5000F	International specification for operational and maintenance data feedback	Draft 0.2
S6000T	International specification for „training“	in process
ASD-STE100®	ASD Simplified Technical English (STE)	Issue 6