

# **LINKING THE NATO CODIFICATION SYSTEM WITH THE GLOBAL TRADE IDENTIFICATION NUMBER SCHEME: AN ALLIANCE IN SUPPORT OF WORLD-WIDE LOGISTICS SERVICES**

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## **1. Introduction**

The cost of owning a weapon system exceeds by far its initial purchase cost, since additional expenditures need to be taken into account, such as acquisition of spare parts to maintain the system operational through its lifecycle. It has been stated that the initial investment for the acquisition of a weapon system represents less than 25% of the total expenses required for maintenance purposes.

This disproportional relationship, coupled with the continuous shrinkage of defence budgets, highlights the need for efficient Logistics. Logistics, as a professional discipline, can be described as “the application of engineering, operational and managerial skills to provide a product with prerequisite quality, reliability, maintainability and supportability, and to sustain safe and cost effective utilisation of that product for its intended purpose throughout its projected service life”.

The core of Logistics is strongly correlated and driven from efficient identification of equipment. The latter is performed through sophisticated systems which were specifically designed to uniquely identify and classify materiel. Two of those, the NATO Codification System (NCS) and the EAN International scheme (EAN) were built for the same purpose, but follow different patterns in terms of materiel recognition.

Following an initiative derived from discussions with the NATO Continuous Acquisition and Lifecycle Support (CALs) office, the Group of National Directors on Codification, AC/135, was requested to undertake a study with a view to examine the feasibility of linking the two systems. For this reason a Working Group comprising of participants from the two communities analysed different scenarios, and finally established a linkage between the NCS and the EAN. Furthermore, it has been well understood throughout the meetings, that there is a definite need for an “awareness course” for Logisticians, who should in turn profit from the generated advantages.

## **2. The NATO Codification System**

The NCS<sup>1</sup> is the Codification system used by the armed forces of all NATO countries in order to facilitate military Logistics operations across NATO. The NCS is an “invisible partner” in the day-to-day business of Logistics, and has been also adopted by 22 non-NATO countries under a specific programme<sup>2</sup> which allows exchange of Codification data by applying NCS disciplines.

The NCS is based on the philosophy of the “Item of Supply” (IOS) concept. This portrays an object or group of objects which has been defined by a qualified Logistics service to meet a specific requirement. The initial step for item identification is the allocation of an Item Name, followed by the selection of the appropriate NATO Supply Group and Class. Afterwards Identification Guides are used to adequately describe the item and its characteristics, thus differentiating it from other IOS, and establishing the supplementary data necessary for Logistics management.

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<sup>1</sup> More information on the NCS is available on the Internet at [http://www.nato.int/structur/AC/135/ncs\\_brochure/ncs\\_brochure\\_e/index.htm](http://www.nato.int/structur/AC/135/ncs_brochure/ncs_brochure_e/index.htm) and also at <http://www.dlis.dla.mil/nato>

<sup>2</sup> The AC/135 Sponsorship programme allows non-NATO nations to exchange Codification data with NATO nations under a specific agreement which stipulates the application of NCS standards. More information on the Sponsorship programme is available on the Internet at <http://www.dlis.dla.mil/nato/sponsorship.asp>

The next step of the process is comprised of the addition of manufacturers references and management information, when these are available. However, it should be noted that the reference number without the item name does not unambiguously identify the item. Finally the NATO Stock Number (NSN), which uniquely identifies an IOS all through its lifecycle, is assigned.

The NCS encompasses as well two features that are unavailable in other item identification systems: 1) an identification approach based on the IOS concept that is applicable to all types of commodities, and 2) a gateway to a vast range of Logistics information required by military Logisticians, and not available in commercial identification schemes.

### **3. The EAN International scheme**

EAN International<sup>3</sup> is a non-profit, business-led association managing a world wide system that enables identification of items, trade and logistic units, services and locations. The purpose is to provide a common language for international trade and commerce applicable to virtually all industrial and commercial sectors. The system includes standards that cover identification and supplementary information, bar code specifications, now called Global Trade Identification Numbers (GTIN), and an internationally used subset of EDIFACT messages called EANCOM.

EAN is based on the "Item of Production" concept. This refers to those parts or objects grouped under the same manufacturer reference number, conforming to the same engineering drawings, specifications, and inspection tests. Unlike the NCS, EAN numbering is non-significant, and no classification of products exists. The only "classification" appears in the process of allocating the forefront part of each number string to participating organisations, preserving in this way the uniqueness of each twelve (UPC-12) or thirteen-digit number (EAN 13) allocated to a product. To ensure accuracy, both schemes conclude with check digits, calculated by an internationally agreed algorithm.

### **4. NCS – EAN: Same Aim, Divergent Concepts**

Since its inaugural meeting, the NCS/EAN/UCC Working Group has inferred that from a technical perspective the two systems represent little duplication due to their different origins. It has been also observed that despite the dissimilar identification concepts encompassed, they are interoperable within the Logistics process, and from a business standpoint they can function in a complementary way.

Having assessed the outcome of a preliminary study, the Working Group proceeded by appraising a detailed proposal of linking the two systems, and finally structured a method for capturing GTIN references within the NCS. This procedure has been approved by AC/135, and utilises a special code "U" within the structure of the NCS corresponding to "a reference number represented by a GTIN structure in accordance with an organisation such as the Uniform Code Council (UCC) or EAN International".

In a concurrent effort, the US designed and set up an NCS/Universal Product Code (UPC) cross reference database<sup>4</sup>, with a view to screen for matches between UPCs and NSNs. The user can retrieve information through specific search keys on UCC manufacturers, Data Universal Numbering System (DUNS) and NATO manufacturer codes (NCAGEs), while UCC members can also upload their product identifiers into the database, the latter being also interactive with scanners.

<sup>3</sup> More information on the EAN is available on the Internet at <http://www.ean-int.org/> and <http://www.uc-council.org>

<sup>4</sup> The NCS/EAN/UCC Cross Reference database is available on the Internet at <http://www.dlis.dla.mil/upc/>

Furthermore it has been agreed to enhance the NATO Master Catalogue of References for Logistics (NMCRL)<sup>5</sup> by adding the above mentioned GTIN references. The necessary software modifications were completed, and this CD-ROM/DVD product presents EAN references in a highlighted (coloured) format, whereas the capability of printing GTIN symbols is also available. It is expected that the number of entries depicting EAN references will increase, as soon as some NATO nations will complete implementation of their new Codification applications, and convert their data to the agreed updated NCS formats.

## 5. NCS/EAN and World Class Logistics Services

The Logistician of the new Millennium is committed to applying quantitative and qualitative techniques which will be coupled with creative judgement, and will therefore infuse Logistics operations into all phases of the projected service life of a material. Following the above pattern, the sphere of military Logistics can be categorised in the following domains:

Acquisition of materiel (initial purchase and reprovisioning); warehousing, management and distribution of resources; maintenance of items (repair and overhaul); disposal of obsolete or useless stock.

The aforementioned categories are directly correlated with fundamental elements of NATO Codification, like item name, classification, identification, user and management data, characteristics and standardisation data, etc. All these appear in an encoded format within the various elements (segments) of the NCS, and as an entity represent the Total Item Record (TIR) of an IOS, i.e. all recorded information of an IOS appearing under a specific NSN.

It is therefore evident that when a Logistician searches for a material by utilising the NSN as the search key, all registered information under this particular NSN will automatically become available. At this point the achieved NCS/EAN linkage, now infused into the TIR, is introducing a new role in the whole process: it is broadening the aspect of Logistics operations by adding further data (GTIN). Those military Logistics applications, which are now enhanced with the addition of EAN references, can perform a cross reference operation within the NCS domain, and provide a “dual” recognition of a certain IOS in NSN and EAN format. This “hybrid” form of identification represents a new trend with exponential growth, and is aligned with CALS mandates which envision tying the NCS with international (ISO) standards. A recent French effort to add GTIN references to all NSN-allocated IOS of their new aircraft carrier “Charles De Gaulle” can be pointed out as an example where the linkage is vigorously applied. This case not only depicts an endeavor in line with the aforementioned initiatives, but introduces another tactical advantage: the enrichment and fortification of the dialogue between military Logistics and industrial suppliers.

Recent peacekeeping operations around the globe have affirmed the need for further utilisation of the NCS. The NCS has been extensively utilised in these operations, supplemented in various cases by the United Nations Common Coding System (UNCCS). The latter has proved efficient, as long as it has been used to support and manage the equipment issued by the UN to nations which only provided personnel. During the campaign in Bosnia, however, certain flaws in the Logistics process based on the UNCCS led to the buildup of unnecessary stocks based on attrition rates. The lack of a common technical language that the NCS introduces was repeatedly acknowledged, and in the Bosnian case the transfer of authority and responsibility from the UN to NATO, allowed allied forces to establish an adequate system of cross-support, specifically through the use of the NCS. Logisticians would therefore like to further exploit the advantages of the NCS with respect to future peacekeeping operations. The visualisation of the contribution of the NCS/EAN linkage would correspond to a case where a theater level Logistician establishes a requirement for an NSN-codified item, which in turn is sent to purchasing authorities. The latter, using a cross reference, could inform the manufacturer on the specific requirement for delivery in standard commercial packaging, with standard commercial GTIN markings for identification. Following the same procedure, this time in a reversed way, the theater level Logistician will be able to decode the GTIN reference into the NSN format, and forward it to the end user.

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<sup>5</sup> The NMCRL on CD-ROM/DVD is the NATO Master Catalogue of References for Logistics containing more than 16 million NSNs, 31 Million Reference (Part) Numbers, more than 1 million Manufacturers and Vendors, and 23 million User registrations.

It has been mentioned above that the NCS/UPC cross reference database screens for matches between UPCs and NSNs. Besides that it offers to procurement authorities one more means of probing for IOS from alternate sources, that is the utilisation of manufacturers descriptions. This can be considered as a major thrust towards promotion of competitiveness amongst suppliers, leading always to substantial financial savings, which actually constitute one of the ultimate aims of Logistics.

Furthermore, the outcome of the collaboration between the NCS and EAN forums will not only avail both communities. It will enhance the technical dialogue amongst users and contractors, promote co-operation and intensify contacts, facilitate the effort of standardisation agencies, focus on environmental issues like safe handling of hazardous materiel, and promote international co-operation. NATO can exploit EAN commercial standards and references, and profit in this way by enhancing and improving its Logistical and supply processes. On the other hand, EAN/UCC will increase its membership base in the defence world, obtain access to data based on NCS disciplines, and share the 50-year experience of the Alliance in cataloguing materiel.

## **6. Future Initiatives and Globalisation**

The NCS/EAN/UCC Working Group has successfully accomplished its initial mandate, i.e. to link the two systems. Nevertheless, after a series of discussion it was substantiated that this endeavour was just the first step of a very long road which will eventually lead to globalisation of identification systems.

At the very last meeting of the Working Group, US Automated Identification Technology (AIT) initiatives were addressed. Certain AIT applications like linear and two-dimensional symbols, optical memory cards, radio frequency identification, and satellite assisted applications were presented, as well as label migration towards ANSI standards. All these epitomise future trends and initiatives, which the Group felt necessary to scrutinise and explore in conjunction with NATO standards.

As far as modifications in EAN/UCC applications to reflect NCS symbologies are concerned, the Group will examine the allocation of an application identifier for NSNs within the EAN standard. This will allow incorporation of NSNs within GTIN package markings, and in this way will provide Logisticians with an extra "force multiplier" tool.

The Group will be also preoccupied with the enhancement of the NCS/EAN/UCC cross reference data base with a view to incorporate non-NATO NSNs, EAN manufacturers and product identifiers, as well as information on the activities of EAN International. Another effort is associated with the creation of hyperlinks connecting various Web sites of analogous organisations, and exploration of possible conversions into the NCS structure, which will capture EAN references during the NATO Codification process. AIT initiatives will be closely monitored with a view to be aligned with NATO standards, and finally a study aiming to determine the most suitable group of NATO manufacturers which could ensure maximum capture and loading of EAN/UPC identifiers will be conducted.

## 7. Conclusions

From the above discussion it is evident that the NCS/EAN/UCC Working Group, after scoring a “direct hit” with the said linkage, will start exploring synergies in fascinating areas where further work has to be undertaken. The scope of its business will not only focus on both communities and on future evolution, but will concentrate on promoting the NCS/EAN linkage, its analogous benefits, and future progress to wider forums like NATO Logisticians. The latter represent the next “target population”, which will apparently harvest the resulting benefits, and fulfil their mission by utilising enhanced tools. They will be the ones who will express a direct need from an end user to the supplier during future multinational peacekeeping operations, and thus their opinion and desire to maintain the supply chain efficient and agile, is well esteemed. Interoperability is the key word in this effort, and represents the shape of things to come with respect to military materiel management. Along with that, minimisation of costs, materiel availability, and continuous support are indispensable factors for the future soldier, who will be called upon to go into battle around the globe either in the form of Rapid Deployment Force or as a Peacekeeper in the uncharted map of the new Millennium.

## 8. References

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4. “Importance of the NCS in Supporting Joint Peacekeeping Operations”, General J.M.Rennucci, The 8<sup>th</sup> NATO Symposium on Codification, S.Diego, USA, May 1997.

## 9. Biography

Mr. Nikolaos DERVENTZIS was the Secretary of the NATO Allied Committee AC/135, the Group of National Directors on Codification. Having obtained a BSc in Statistics and Actuarial Sciences (University of Piraeus, Greece, 1993), and a MSc in Statistics with Applications in Medicine (University of Southampton, UK, 1995) he joined the NATO Maintenance and Supply Agency (NAMSA) in May 1995 being employed for 1.5 years at the financial department. In October 1996 he was appointed as the Secretary AC/135 in the NATO Co-operative Logistics Programme. Furthermore, he was employed by the “Hygeia” hospital of Athens in the financial department (1985-88), and served his obligatory military service as a sergeant in the Hellenic Air Force. Nikos left NAMSA in February 2003 to take up an appointment with a Greek Battery Manufacturer. In addition to his work, Mr. Derventzis is publishing articles in Greek Defence Magazines on contemporary air warfare.