The NATO Codification System (NCS): A Bridge to Global Logistics Knowledge

By

Brenda Eddy and Steven Arnett
Defense Logistics Information Service

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1. GENERAL

The NATO Codification System (NCS) has been in place since the mid-1950s. It provides standards for the use of a common stock identification system throughout the NATO alliance. We tend to take this “common language of NATO logistics” for granted in field operations. The NCS is quickly appreciated, however, when the operational commander finds himself in a joint environment with partner countries each using something different.

In his address to the 8th NATO Symposium on Codification, in May 1997, General de Brigade Jean-Marc Renucci, Chef de la Division “Organization et Logistique,” Etat-Major des Armees France, spoke of his experience during the peacekeeping operations in the former Yugoslavia. He explained how multinational coalitions have been increasingly used for peacekeeping since the fall of the Berlin Wall. In the former Yugoslavia, for example, more than 30 nations were involved under the framework of the United Nations. Gen. Renucci described the patchwork of UN battalions, Non-Governmental Organizations (NGOs), and other charitable agencies. The experience of the French Forces was that the lack of a common technical language led to an intolerable waste of resources. With the transfer of authority and responsibility from the UN to NATO, the forces were able to set up a very efficient system of cross-support, specifically through the use of the NCS.

The NCS is an "invisible partner” in the day-to-day business of logistics. Beginning in the United States, and then expanding to NATO, multinational use of the NCS today is growing at a faster rate than ever before. This article provides an overview of this little publicized aspect of international logistics support.

A very significant event occurred in Moscow, during January 2003, when NATO and Russian officials signed the “sponsorship agreement” which welcomed Russia as a “sponsored” user of the NCS. Beginning in 2004, Russia expects that all Russian weapons exports will include NATO classification for component parts. The Russian desire to align with the NCS is based on the fact that up to 40% of the arsenals of NATO member countries in Central Europe consist of Russian arms and spare parts.

2. ORIGINS AND GOVERNANCE

The NCS provides NATO countries with a uniform and common system for the identification, classification, and stock numbering of items of supply. It is based on the U.S. Federal Catalog System (FCS), which is operated by the Defense Logistics Information Service (DLIS) located in Battle Creek, Michigan, a field activity of the Defense Logistics Agency (DLA). The foundation for this system within NATO rests in two NATO Standardization Agreements (STANAGs). STANAG 3150, “Uniform System of Supply Classification,” adopts the U.S. system of classifying supplies as the standard within the Alliance. STANAG 3151, “Uniform System of Item Identification,” adopts other basic standards for identification of supply items and sets the governing structure in place for the NCS.

The NCS is governed by Allied Committee 135 (AC/135) - “NATO Group of National Directors on Codification.” This committee is composed of representatives from each NATO member nation and a participant from the NATO Maintenance and Supply Agency (NAMSA). The AC/135 functions under the authority of the Conference of National Armament Directors (CNAD) at NATO and normally meets twice per year. The committee is committed to increasing the effectiveness and efficiency of defense logistics interoperability between participating nations and providing the bridge to facilitate global logistics operations.

3. COMMON RULES AND DATA STANDARDS

The system provides NATO allies with a common identification language for use within national activities and between member countries. Non-NATO countries that are “sponsored” members of the NCS also benefit from the system. The foundation of the NCS is the principle that the responsibility for the codification of an item rests with the country that manufactures it and controls its design. This is true even if the item is not used within the military forces of that country. Common rules and data standards (including a Data Element

Dictionary) allow for improved communication between members. Using coded data allows for automatic translation into national languages through decode tables.

3.1. Item Identification

Item identification is the most important element of the codification system because it establishes a unique identification for every item of supply. The identification consists of the minimum data required to establish clearly the essential characteristics of the item, i.e., those characteristics that give it a unique character and differentiate it from all others.

The NCS identification process is based on the “Item of Supply” concept. The term “item of supply” refers to an item required for acquisition in order to satisfy a logistics need. It can consist of one or many “items of production” (i.e., a product of a specific manufacturer) having equivalent “fundamental characteristics”.

The system employs rules for “naming” each item of supply using standard naming conventions to ensure uniformity among users. The NCS controls these naming conventions using a dictionary of Approved Item Names. Each approved name is given a five digit numeric code. This code-based system provides for easy translation and communication between nations in varying languages. After an item has a name, a suitable supply classification is determined.

The vast number of items of supply in the NCS has made it necessary to establish manageable commodity classifications of items, by family grouping. The NATO Supply Classification system provides for discrete commodity groups and classes. Each group consists of items of the same physical or performance characteristics or the same application. Within each group, there are more specific classes that further define the specific commodity-type of items included. For example, one large commodity group of items is “Hand Tools,” identified as Group 51. Within the large "group” of hand tools, there are sub-classes that differentiate the types of hand tools (i.e., non-powered, powered, tool boxes and kits, and sets of hand tools).

A unique number identifies each of the sub-classes, for example:

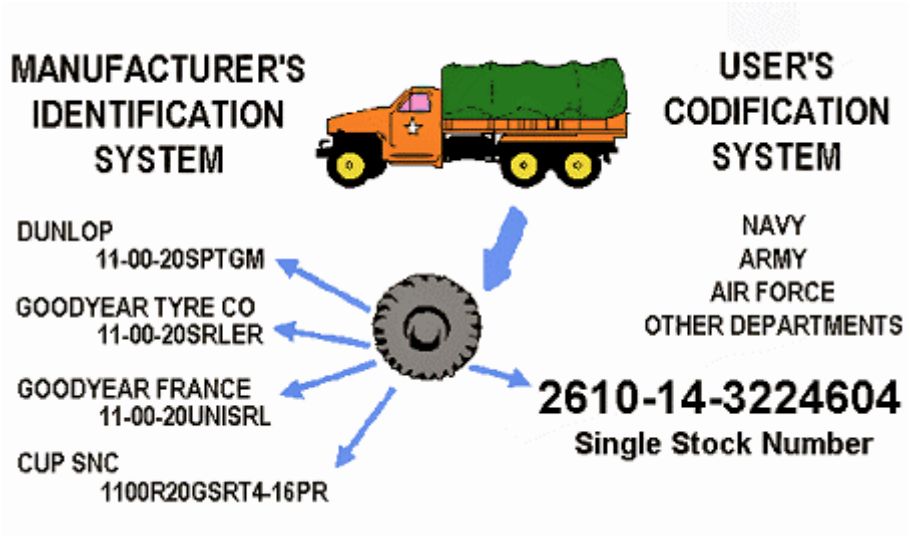
5110 - Non-powered, edged hand tools
5120 - Non-powered, non-edged hand tools
5130 - Power driven hand tools
5140 - Tool and hardware boxes
5180 - Sets, kits and outfits of hand tools

To achieve the NCS objectives of (1) increasing the efficiency and effectiveness of logistics operations; (2) facilitating data handling; and (3) minimizing costs to user nations, it is essential that each item of supply be assigned a unique name, classification, identification and a NATO Stock Number (NSN).

3.2. The NATO Stock Number

Countries that participate in the NCS follow common standards and techniques to assign NSNs to items of supply in their defense inventory. The National Codification Bureau (NCB) within each country centrally assigns their national NSNs. The assignment of an NSN fixes the identity of each distinctive item of supply. All NSNs are uniform in composition, length, and structure. Each is represented by a 13- digit number, which can be divided into 3 unique parts:

- the first four digits are the NATO Supply Classification (NSC) code, which relates the item to the group and class of similar items
- the next two digits indicate the assigning NCB code (each country has its own two-digit NCB code—the United States uses “00” and “01”)
- the final seven digits are assigned sequentially and have no inherent significance. However, this number relates to one and only one item of supply within the codifying country.



Within NATO, the NCS currently contains 16 million active NSNs (about 7 million U.S. and about 9 million assigned by other NATO countries). The items represented range from hand grenades to guided missiles, from propeller blades to space vehicles, and from soap dishes to washing machines.

3.3. Categories of Data

The data collected on supply items is stored in national databases for immediate Categories of Item Data retrieval and use. Users of the NSNs may access details of items. Common descriptive guides, available to all participating countries, allow for storage and exchange of coded physical and performance characteristics for each NSN. Using a suitable decoding tool, translation of these coded descriptions is possible. Management data may be stored for NSNs and supports all logistics disciplines, including such data as source of supply, unit of issue, packaging information, handling criteria, hazardous materials coding, and disposal information.

3.4. Relationship between the NATO NCBs

Each NATO country and all non-NATO NCS sponsored countries have established National Codification Bureaus (NCBs) or central operating organizations, to implement the NCS. The NCBs play an essential role in all logistics operations. The information, services and products provided by the NCBs support every facet of national and international logistics operations. Each NCB is the sole responsible authority within its country regarding codification data exchange and services. DLIS serves as the NCB for the United States. DLIS is responsible for liaison services to the NATO countries and to other countries that use the NCS.

3.5. NATO Stock Number Assignment and "User Registration"

The U.S. NCB catalogs supply items used by our NATO partners and other foreign allies. It processed over 36,000 allied requests for U.S. NSN assignment during fiscal year 2002. These items represent supply materials manufactured in the U.S. but intended for use within NATO or by other allied forces supported under a Foreign Military Sales (FMS) case. For every NSN assigned, the responsible NCB must (a) verify that the item is procurable; (b) research each item to obtain supporting technical data; (c) name the item; (d) classify it; (e) describe each item; and (f) assign the NSN. The almost 25,000 new NSNs assigned by the U.S. NCB during the last year represent about one quarter of the total annual NSN assignments made by the United States.

On behalf of the U.S. military services, the U.S. NCB also processed over 6,500 requests to other NATO country NCBs for assignment of foreign (non-U.S.) NSNs. This total represents items of foreign origin (manufacture) incorporated into our U.S. operational force structure.

Around 43% of all the 6.6 million "active" U.S. National Stock Numbers have at least one allied user "registered" as an interested user. By a process known as "user registration," allies may establish a record of their national interest in a U.S. NSN. Recorded users may elect to receive notification of changes made to the NSNs that they have an interest in. There are currently about 50 separate foreign countries recorded as users on various NSNs in the U.S. catalog system.

4. INTERNATIONAL LOGISTICS DATA EXCHANGE

4.1. Maintenance of Logistics Data Records

Internationally agreed methods and procedures have been established to facilitate the regular exchange of codification data and services among member countries. The NCB within each country is responsible for maintenance of the Total Item Record (TIR) for each NSN. Dissemination of logistics data to other NATO countries is the responsibility of each NCB.

The TIR for each NSN contains segments of data, each composed of separate types of logistics data. A segment is a group of related data elements, functionally categorized. The major data segments are:

Segment A - Identification data (including item name)

Segment B - Major Organizational Entity (MOE) Rule data (indicates NSN users)

Segment C - Reference number data (including manufacturer codes)

Segment E - Standardization data

Segment G - Freight data

Segment H - Management data

Segment K - Cancellation data

Segment M - Clear text characteristic data

Segment V - Coded characteristic data

Segment W - Packaging data

Output is normally generated as either informational or file maintenance updates. TIR file maintenance is any data addition, change, or deletion related to an existing NSN or the establishment of a new NSN. Each participating country specifies the type(s) of file maintenance output for which they want notification. Not all NCBs store all segments. Tailored output notifications send only the specific transaction results and specific segments of data required by each allied customer. The data they receive reflects the data they want sent to them, based on their specific requirements. Countries can change the type of output notifications they want at any time.

Because participating NATO nations and NCS sponsored non-NATO countries routinely exchange file data, there are standard procedures for doing this by the exchange of magnetic tapes or cartridges as well as through telecommunications. Currently, virtually all data exchange among NCS users occurs via telecommunications.

The NATO Mailbox System (MBS) provides for the telecommunication of codification data through an exchange station at NAMSA headquarters in Luxembourg. The system provides for:

- central hardware/software platform with various predefined connectivity options for the subscribers
- the handling of various protocol conversions

NAMSA performs transmission control for all transactions included in the MBS and stores data in particular "electronic mailboxes" for retrieval by the destination activities (countries). Subscribers of the MBS can be NCBs, NAMSA, and sponsored non-NATO countries. U.S. cataloging information can also be received on a

bilateral basis through the International Logistics Communications System (ILCS), which is administered by the Defense Automatic Addressing System Center (DAASC), Wright-Patterson Air Force Base in Ohio. The ILCS is provided to countries on a subscription basis financed by FMS cases. It is used to create and transmit requisitions, receive and process status documents, and transmit and receive narrative messages. The ILCS is also used for transmitting codification data. The Arms Export Control Act requires countries to pay for the transmission of requisition data; however, the Act permits the transmission of codification data and cataloging services to NATO and NATO member governments without charge if NATO and the member countries provide such data and services in accordance with an agreement on a reciprocal basis, without charge to the U.S. Government. Around 30 million records of U.S. cataloging information are automatically output to our allies each year.

4.2. Cataloging Tools Maintenance

"Cataloging tools" are the supporting reference publication and data files which support operation of the NCS. The following list offers a few examples of the tools that are essential to the success of the NCS.

- Cataloging Handbook of the Federal Supply Classification system (Groups and Classes) (H2) and NATO Supply Groups and Classes (ACodP-2)

  This cataloging handbook presents the classification structure of the NATO/Federal Supply Classification system (N/FSC), showing numeric groups and classes listed in the numeric order of the four-digit FSC code-numbering system.

- Cataloging Handbook of Item Names (H6)/NATO Item Name Directory (ACodP-3)

  This handbook contains an alphabetic index of item names, including a reference to the N/FSC following each Approved Item Name (AIN). Definitions of each name are also included.

These two cataloging handbooks include both English and French text, the official languages of NATO. Many participating nations maintain versions of these handbooks in their own national languages. For example, Saudi Arabia has produced Arabic versions of both handbooks.

- FIIG – Federal Item Identification Guide

  A FIIG is a document used to identify an item by describing its attributes or characteristics (in coded format) to differentiate it from other items of supply and to establish the supplementary data necessary for logistics management.

- NCAGE – NATO Commercial and Government Entity Code

  It is necessary to record each manufacturer's names against codified items. A 5-character NCAGE is assigned to each manufacturer to meet this requirement. The code reflects the source and location of technical documentation for an item. Each NCB assigns the codes for its national manufacturers and these are recognized and exchanged between NCS members.

The United States is the proponent for the official naming and classification standards. It maintains these codification system support files at each NCB by scheduled electronic update.

4.3. Benefits of the NCS

The NCS is an integral part of supply operations throughout the world. It furnishes accurate information to all participating countries on the characteristics of millions of items. It simplifies the solution of supply data management problems by providing quick responses from a single, up-to-date source. The NCS offers many significant advantages to NATO and non-NATO countries, as well as to private sector participants outside the defense community.

4.4. Operational Advantages:

- Enhanced opportunities for standardization, by revealing the different varieties, types, and sizes of items in supply systems, allowing parts from a number of weapons systems to be used in common
- A national and NATO-wide knowledge of all available military assets and resources allows for rationalization of inventory management by sharing resources on spare parts and maintenance activities, and a minimum distribution of essential spare parts during the deployment of forces in a theater of operation
- An accurate description of the items permits users to readily find equipment which meets requirements for replenishment without delay
- The use of a common language understood by everyone simplifies the technical dialogue between participating countries and users
- The use of computer technology allows the recording, processing, and transmittal of item identification data and related management support data in easily accessible databases
- Descriptions of items enable design engineers to accurately search for and select components or equipment meeting technical or functional characteristics more efficiently than with any commercial catalog

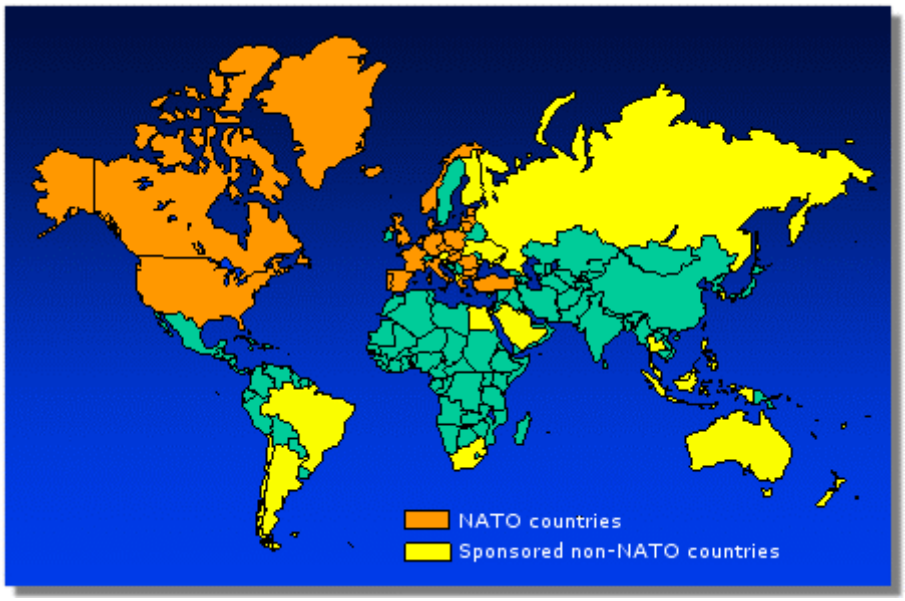
4.5. Economic advantages:

- The NCS database allows visibility of parts already stocked in the supply system and helps prevent the entry of duplicate items. This practice supports the standardization of managed items and eliminates unnecessary costs for identification, storage, and other related supply functions. Nearly 50 percent of the components used in the design of new equipment are already codified
- Effective use of assets by enabling supply support interchange between linked organizations and between countries
- Reduction in inventories, storage space, record keeping, and personnel through elimination of duplicated items
- Reduced equipment downtime by facilitating cross support between services and cross support between countries
- Reduced procurement expenses by consolidating purchases, allowing less frequent purchases in greater amounts

5. NCS SPONSORSHIP

During its existence, many non-NATO countries, including many PfP countries, have adopted the NCS. More and more countries are seeking and receiving sponsorship within the NCS. Sponsored countries sign an agreement to exchange codification data and to abide by the rules and procedures of the system. Among other things, the rules require countries to provide equivalent safeguards to protect sensitive and proprietary data.

A non-NATO country seeking sponsorship makes a written request to a NATO country or the Secretariat of AC/135. All NATO member nations then determine their national position on the sponsorship. Each member provides written concurrence or non-concurrence on the request. Within the United States, DLIS collaborates on the national position, through HQ DLA, to the Deputy Under Secretary of Defense (International and Commercial Programs) for official comment. The AC/135 Group of Directors grants the country NCS sponsorship upon agreement by all NATO member countries, and upon signing of the official sponsorship agreement by both the representative of the applicant country and the Chairman of the AC/135. The AC/135 signs sponsorship agreements on behalf of NATO, and a responsible representative from the defense ministry of the sponsored country signs on its behalf. Information about NCS sponsorship is kept up-to-date at Web site http://www.dlis.dla.mil/nato/default.asp



NATO Countries	AC/135 Sponsored Countries	Countries using the NCS
Belgium	Albania	Israel
Bulgaria	Argentina	Papua New Guinea
Canada	Australia	Solomon Islands
Czech Republic	Austria	
Denmark	Brazil	
Estonia	Chile	
France	Croatia	
Germany	Egypt	
Greece	Fiji	
Hungary	Finland	
Iceland	Indonesia	
Italy	Korea, Rep. of	
Latvia	Kuwait	
Lithuania	Macedonia, Fmr Yugoslav Rep. of	
Luxembourg	Malaysia	
Netherlands	New Zealand	
Norway	Philippines	
Poland	Russia	
Portugal	Saudi Arabia	
Romania	Singapore	
Slovakia	South Africa	
Slovenia	Thailand	
Spain	Tonga	
Turkey	Ukraine*	
United Kingdom		
United States		

(* NCS sponsorship request in preparation - Situation as of June 2004)

The benefits of sponsorship include the following:

- Use of a codification system that is fully designed and proven through many years of experience and worldwide use
- Improved interoperability with the NATO countries and other countries around the world
- Visibility of nationally manufactured items to all users of the NCS around the world
- Telecommunications data exchange with the NATO countries and other countries through the NATO MBS system of data exchange
- Ability to influence further development of the NCS
- Although the recent expansion of the NCS has reached each of the inhabited continents of the world, the primary focus has been in two areas:
- The Partnership for Peace (PfP) nations in Europe
- The Pacific Rim nations that are part of the Pacific Area Cataloging System (PACS) Forum

5.1. Partners for Peace (PfP)

The PfP countries include former members of the Warsaw Pact, former Soviet republics, and neutral countries. Participation in the NCS is an important first step toward interoperability with the NATO Alliance. About 30 countries are members of PfP. A number of these countries are already NCS sponsored (Austria, Croatia, Finland, Macedonia and Russia). PfP countries are now participating in the on-going management meetings of AC/l35. In 1995 in Hamburg, Germany, and in 1998 in Bulgaria and the Ukraine, NATO AC/135 held workshops for PfP countries to familiarize them with the full range of topics related to the NCS. Members of AC/135 have also made many bilateral contacts with PfP countries. Representatives of the U.S. NCB at DLIS have visited Lithuania, Bulgaria, Macedonia, Romania, Slovakia and Slovenia to provide NCS orientation and consultation services under "Mil-to-Mil" programs. DLIS has also hosted delegations from several PfP countries.

5.2. NATO AC/135's BASELOG Program

As a result of increasing contacts with non-NATO Nations and their defense industries, AC/135 has concluded that PfP nations require substantial support in their efforts to adopt and implement the NCS. To meet this requirement, AC/135 has developed an initiative known as project BASELOG. This allows AC/135 to put in place a framework for the provision of generic codification services for non-NATO, and particularly, PfP nations, as well as for NATO nations, if so desired. The scope of services covered under the umbrella of BASELOG encompasses the provision of basic codification services, consultation services, training in NATO codification, various codification data products, sponsorship support services, and other services as required.

BASELOG is an AC/135 sponsored project, financed on a reimbursement basis, utilizing a "clearing house" approach. A BASELOG coordinator has been established at the NATO Maintenance and Supply Agency to register non-NATO requirements, make them known to NATO countries, and provide AC/135 with reports. Appropriate offers of support are accordingly submitted to fulfill the registered requirements, with NATO nations providing concrete support to assist PfP Nations in adopting the NCS. The U.S. NCB is an active participant and contributor to the BASELOG program.

AC/135 commenced the BASELOG program with Lithuania (the first nation to respond to the BASELOG survey) as the pilot nation. During the pilot phase, the procedures were scrutinized, and the soundness of the whole project was validated. AC/135 also agreed that in order to enhance and promote co-operation between NATO and PfP nations, no subscription charges would be levied on participating nations in the first year of the project.

5.3. The Pacific Area Cataloging System (PACS)

The PACS is an initiative of the Pacific Area Senior Officers Logistics Seminar (PASOLS), sponsored by the Commander in Chief, U.S. Pacific Command. Its purpose is to establish common cataloging rules within the Pacific region based on the NCS. Twenty-one countries participated in a series of working group meetings beginning in 1995. This led to the establishment of the "PACS Forum" in 1997. The United States and Canada have taken a leading role in forming the group and have provided the link between PACS and NATO. Twelve countries have formally signed the PACS charter, and other nations, such as Japan and China, participate as observers. The following countries are signatories:

- Australia
- Canada
- Indonesia
- Malaysia
- New Zealand
- Papua New Guinea
- Philippines
- Republic of Fiji
- Singapore
- South Korea
- Thailand
- Tonga
- United States

The PACS Forum encourages members to seek formal sponsorship in the NCS by applying to the AC/135. Many PACS members have already done so. Indonesia is currently awaiting approval as a NATO Tier 1 sponsored country.

5.4. Other Country Interest

In addition to the PfP and PACS initiatives, the NCS is increasingly used in South America, with Brazil and Argentina taking the lead. Furthermore, South Africa is using the NCS, and the United Nations is considering use of the NCS and integrating it with its UN Common Coding System.

5.5. NATO Codification Products

NATO offers CD-ROM/DVD products containing data from all the NATO countries.

- Information about the NATO Ammunition Data Base (NADB) is available by consulting Web site http://www.dlis.dla.mil/nato/natodata.asp#ammo

- Information about the NATO Master Catalogue of References for Logistics (NMCRL) can be found by contacting Web site http://www.nato.int/structur/AC/135/nmcrl/nmcrl_e/index.htm.

The NMCRL contains NSN data from all the NATO countries. The April 2002 version of the NMCRL includes many updates to the product, including the addition of non-NATO data (NSNs and addresses), cross references to UNCCS codes and more.

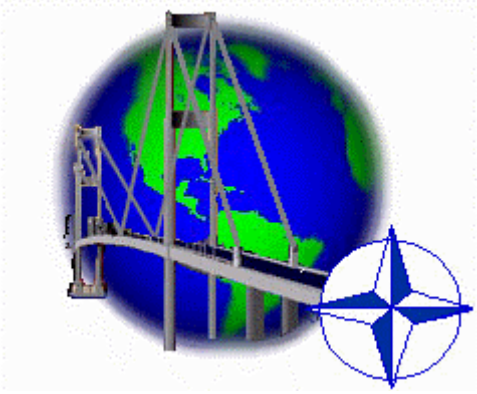
5.6. The NCS - A Cornerstone of Defense Logistics Cooperation

The NCS has become the worldwide standard for civilian and military cataloging and material management, as shown by its widespread adoption by countries all over the world. This growth was symbolized by large and widespread attendance at the 8th NATO Symposium on Codification in 1997. The symposium was

hosted by DLA in San Diego, California, and was attended by over 400 representatives from 41 countries around the world. NATO Allied Committee 135 more recently hosted the 9th International Symposium on Codification in Luxembourg during September 2001.

Effective logistics requires obtaining the appropriate equipment, in the right place, at the right time. While all armed forces must maintain their equipment in a perpetual state of operational readiness to ensure the sovereignty of their respective country, each must also realize savings by avoiding duplication and simplifying administration. The NATO countries have accomplished this need through their "invisible partner," a highly effective common system in the business of logistics—the NATO Codification System.

The NATO Codification System
A Bridge to Global Logistics Knowledge



6. INFO

For more information on the NCS, visit

- the AC/135 Web site at :
  http://www.nato.int/codification
- the DLIS Home Page at :
  http://www.dlis.dla.mil/nato/default.asp
- the PACS Home Page at :
  http://www.defence.gov.au/dmo/_jlc/pacs/homepage.htm

Points of contact for questions regarding this article are:

Chris Yoder or Steven Arnett

Defense Logistics Information Service
DLIS-KI
74 Washington Avenue N
Battle Creek, MI 49017-3084

Chris Yoder :
PHONE: +1 (269) 961-4286
E-MAIL: Chris.Yoder@dla.mil

Steven Arnett :
PHONE: +1 (269) 961-4328
E-MAIL: Steven.Arnett@dla.mil