NASSCO Assessment On Implementing The Common Parts Catalog (CPC)

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Implementation of a Common Parts Catalog

Submitted by
Electric Boat Corporation
On behalf of the
Project Team Members

Category B Data

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1 INTRODUCTION

EB, BIW and NGSS have consolidated their efforts to collectively develop and implement a Common Parts Catalog within and between their shipyards. This task will interface with existing catalog functionality, fulfill future technology and provide both short and long-term cost saving opportunities to our shipyards, our customer and our supply chain. This effort includes the review of present business processes at all three companies to determine "Best Practices" models in the areas of part commonality/equivalency, part standardization and part data configuration management.

NASSCO has decided to assess the CPC implementation at the above shipyards to determine if CPC would also support their own shipyard's business needs. The purpose of this NSRP CPC Project Deliverable is to provide the NASSCO CPC Assessment Report to the industry.

2 SCOPE

The scope of this deliverable is to provide the industry with the product of NASSCO's CPC Assessment on implementing CPC at their shipyard.

This deliverable will specifically provide;

- Background on making the decision to perform the CPC Assessment.
- Final recommendation to proceed with the CPC Implementation at NASSCO.
- Rationale and business case for this recommendation.
- Estimated cost savings from the CPC NASSCO implementation.
- Implementation and legacy interface requirements.

3 DEFINITIONS:

Common Parts Catalog (CPC):
A part catalog implementation task being undertaken by BIW, EB, and NGSS which is the single electronic repository for all technical, quality, and document data associated with a unique catalog number designation.

Computer Sciences Corporation:
BIW and EB's outsourced IT implementers.

Information System Department (ISD):
NASSCO's IT department.

MACPAC Part Master:
NASSCO's legacy part catalog.

Purchase Spec Parts:
Procured parts to engineering specific requirements. Some shipyards call these "engineered component parts." These parts are not being planned to be included in NASSCO's CPC Implementation.

Raw Material:
Procured stock in the "raw" condition. These include part commodities such as bar stock and shapes. These commodities are being planned to be included in NASSCO's CPC Implementation.

Spec Parts:
Procured parts to engineering specific requirements. Some shipyards call these "engineered component parts." These parts are not being planned to be included in NASSCO's CPC Implementation.

Standard (non-spec material):
Non-engineered components. These parts will be included in NASSCO's CPC Implementation.

Standard Group:
That management group whose primary function is to maintain NASSCO's parts catalog.

TRIBON:
NASSCO's CAD platform.

Virtual Private Network (VPN):
An existing communication link between NASSCO and BIW which will most likely be used to support CPC communication between GD Marine companies.

Yard Designed Parts:
Manufactured parts within NASSCO. These parts are not being planned to be included in the NASSCO CPC Implementation.

4 NASSCO ASSESSMENT OF THE COMMON PARTS CATALOG (CPC)

The inserted file below is the NASSCO CPC Assessment Report.

NATIONAL STEEL AND SHIPBUILDING COMPANY
A General Dynamics Company

NASSCO ASSESSMENT of the COMMON PARTS CATALOG (CPC)

3/22/04

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NASSCO ASSESSMENT OF THE COMMON PARTS CATALOG

EXECUTIVE SUMMARY

1.1 Background

U.S. Shipbuilding has identified a commitment to become more competitive in the world commercial market as well as significantly reducing the cost of ships to the Government. These efforts are requiring the marine community to examine process improvements to reduce time and related costs in all phases of ship design, construction, and life cycle support. As a result, Electric Boat Corporation (EBC) and Bath Iron Works Corporation (BIW) within General Dynamics Marine Systems Group and Northrop Grumman Ship Systems (NGSS) initiated the Shipyard Common Parts Catalog (CPC) Project in 1999. The specific process improvements that are being addressed by this project are: part commonality/equivalency, part data configuration management, flexible part search, and enabling of part standardization.

NASSCO has been asked to perform an assessment of the Common Parts Catalog to determine what level of participation would be appropriate. The team performing the assessment included representatives from Standards, Material Control, Information Systems and Purchasing. Input was received from Hull Engineering, Outfit Design Engineering, Steel Production Control, Outfit Production Control, Material Control, Repair and Integrated Logistics. An expanded team listened to a presentation from the CPC Project Team Leaders in early December. The core team met weekly and a contingent went to Electric Boat in early February to observe the system and gather additional data.

1.2 Recommendation

NASSCO should participate in the Common Parts Catalog Project and proceed toward NSRP funding under an Electric Boat led Project. The year-long implementation should be in 2005, if funded, so that the savings can be realized on the next new design contract and procurement. All non-spec material would be included in the catalog. Excluded areas would be steel and spec parts.

Most of the costs associated with the project are from converting the MACPAC part master data to the CPC standards requirements and determining intra- and inter-shipyard part equivalency. If NSRP funding is not available, NASSCO does not have the funds available to participate. The largest potential for savings realized from CPC participation is in standard material procurement. The ability to make these decisions and have them provides the highest rate of return is early in the design.

The short-term reasons to implement CPC:

- Save labor during parts selection/inquiry
- Support knowledge management by transferring parts information knowledge from a few key people to an information system.

The long-term reasons are:

- Reduce the number of parts being used by removing duplicates
- Limit choices through a formalized standardization program facilitated by CPC
- Use the same types of parts across shipyards to reduce procurement costs

1.3 Rationale

Engineering labor will be saved by making all part numbers available to the designer through an easy-to-search database. The correct part for a contract can be quickly located along with the associated effective standards documentation. The current system of using MACPAC part master records and the personnel resources in the Standards Group is time-consuming and can produce duplicate part numbers because of the difficulty and time in locating the correct part number.

There are currently a few people in the Standards Group who provide most of the support to the outfit designer engineers making material selections. The vast part number knowledge of a few people needs to be captured, standardized, managed and transferred to others in the organization that require it. CPC will make this information available to all users through the many ways a part can be searched. CPC can segregate parts by attributes attaching them to specific contracts. CPC would facilitate the ability to develop a part standardization program that would have the designer making material selections for only the parts effective and approved for the design based on established standardization criteria. The Standards Group would use CPC to assist in the creation of new standard parts that conformed to the design contractual requirements in respect to document effectivity and interchangeable revisions. This would provide an additional level of control to prevent part number proliferation, promote standardization, and assure contractual document effectivity compliance.

There could be additional benefits to ILS for better document and parts information in regards to determining parts commonality when working on Navy contracts. Procurement has a potential for savings but past efforts at common purchasing agreements have not shown meaningful benefits because of the use of local suppliers.

1.4 OTHER OPTIONS CONSIDERED:

Option 1 Implement as "read-only" in 05, full implementation in 06

Pluses: Some benefit would be gained by establishing the T1 line and being able to see what is in the system from EB, BIW, and NG. We would not have the implementation costs of converting data and determining equivalency, just the operational costs.

Minuses: The NSRP money to implement might not be available if we wait. These funds will pay to implement but not maintain. We may not want to invest if it is NASSCO money and there is not a large design effort to save money on labor and new construction procurement.

Option 2 Do not implement, use current system

Pluses: No disruption to current operation.

Minuses: No cost savings based on part searches, part standardization, part data re-use, etc.

Option 3 Use Livelink for a parts catalog

Pluses: Less expensive and would provide searchable database and documents. Would be less complex and tailored to NASSCO.

Minuses: Uses more internal resources and will not facilitate parts sharing or help move toward unifying procurement. Will not utilize existing CPC Standards.

Option 4 What if no NSRP funding?

If there were no funds to pay for implementation costs, there would not be an acceptable ROI.

BUSINESS CASE

2.1 SAVINGS:

Searchable Database - Reduces the time to create and/or search for part numbers in design engineering, standards, production control, and repair.

Design Engineers – Reduce search time when choosing parts to be modeled and parts creation time by not creating duplicate parts.

(# of User) x (hrs/year) x (20% parts search time) x (30% reduction*) = Hours Saved

(5 Designers) x (2080 hrs/year) x (.20) x (.30 reduction) = 624 ≈ 600 effort-hrs

(600 hrs saved) x ($50/hr) = $30,000/year savings

Standards Group – Reduce time to assist designers in parts selection.

(# of Users) x (hrs/search) x (searches/year) x (80% reduction) = Hours Saved

(2) x (.5 hr/search) x (600 searches/year) x (.80) = 480 effort hours

(480 hrs saved) x ($50/hr) = $24,000/year savings

Production Control - Identify parts brought in by Production for procurement and unlabelled parts returned to Area 052.

(# of Users) x (hrs/search) x (searches/year) x (80% reduction) = Hours Saved

(7) x (1 hr/search) x (26 searches/year) x (.80) = 146 effort hours

(146 hrs saved) x ($30/hr) = $4,380 ≈ $4000/year savings

Repair - Reduce time to identify additional parts for Production when the part # is not known

(# of Users) x (hrs/search) x (searches/year) x (80% reduction) = Hours Saved

(4) x (1 hr/search) x (26 searches/year) x (.8) = 83.2 ≈ 80 effort hours

(80 hrs saved) x ($30/hr) = $2400 ≈ $2000/year savings

Procurement – Reduce non-spec material costs by 1% thru joint purchases as GD Marine

(non-spec – FOS) x (1%) = $ saved

One T-AKE ship ($27,000,000) x (.01) = $272,000 ≈ $270,000

Annual Savings:

Design	$30,000
Standards	$24,000
Production Control	$4,000
Repair	$2,000
Procurement	$270,000
Total Annual Savings	$330,000

Items that could show savings (based on fewer parts) but were not included:

- Reduction in storage for inventory
- Reduction in spares
- Reducing engineering time to create parts

3.1 IMPLEMENTATION REQUIREMENTS

The following information is provided as deployment information in support of a company approved plan to proceed with the project. Presently the implementation requirements for CPC are not completely identified however the following tasks are known, and should be considered necessary to fully integrate CPC's use within the NASSCO domain. ISD supported tasks include: project readiness, network connectivity to CSC at Norwich, CT, local software installation, attribute definition, data conversion, creation of interface between CPC and MACPAC, and functional/acceptance testing. The CPC interface requirements to Tribon discussed in section 1.3 are not included in this assessment.

Project Readiness

Confirm CSC ability to support NASSCO implementation plan. Validate 'Stage' and 'Production' server sized appropriately to handle all GD Marine Group needs. Confirm availability of 'Stage' (test) environment. Confirm Upgrade to i2 Version 6.0.1 from Version 5.2.1 is completed and fully tested and installed in 'Production'. Obtain i2 'fat' and 'thin' client installation requirements and software.

Connectivity

In order to facilitate the use of CPC we need to establish network connectivity to CSC at Norwich, CT. The current connection path is through a VPN (Virtual Private Network) administered by GD Corporate and BIW. That path currently is used to communicate with BIW and was at one time used also to communicate with a server at EBC. Review of the VPN, router, and firewall configurations on the Norwich end indicate that it would be possible to open a connection from NASSCO to the CPC servers on the EBC network.

The connection path is not a dedicated T1 line between the sites. Most of the transmission path is in fact the Internet. The NASSCO/BIW packets are encrypted and placed in a IPSec tunnel for transmission over the Internet. There appears to be no additional network hardware that would be needed to enable NASSCO access to CPC at Electric Boat. Routing, firewall, and VPN configurations changes would be necessary to direct the CPC packets to the VPN gateways and to allow the packet flows in and out of EBC and NASSCO. These changes should be reasonable to make.

BIW administers the VPN gateway at NASSCO and likely would have to grant permission for use of the connection for CPC access. There may be a requirement to share some portion of the cost for the connection. Bandwidth requirements and availability relating to this connection path have not be fully defined or reviewed. It is likely that satisfactory response time could be obtained over the path. Security requirements have not been reviewed fully. It is possible, though not likely, that using the Internet for packet transmission could be a security problem.

ISD recommends establishment of this connection to the 'Stage' or 'Development' servers at Norwich as first step, with connection to 'Production' server to follow after adequate testing is perform and security issues are cleared.

Software Installation

Network Systems will need to assist with local installation of i2 'fat' client to support data conversion and testing. Network Systems to plan and implement push of i2 'thin' client as determined by project team.

Attribute Definition

Compare existing CPC attributes to MACPAC part master attributes. Identify NASSCO specific attributes not supported by CPC. Some of the unsupported attributes include: conversion factor and raw material attributes i.e. FLG THICKNESS and FLG WIDTH. All attribute changes need Central Configuration Control Group (CCCG) approval before implementation. Request CCCG approval to modify the 'Attachment' attribute. Change to allow adding a hyperlink (URL). The hyperlink will be used to connect with the material specifications stored within Livelink.

Data Conversion

Map the existing downloaded MACPAC part catalog to CPC. Import the part catalog to the 'Stage' server of CPC. For other attributes not covered in the part master download, investigate use of Standards Department Access DB. If found to be useable prepare a download and import to CPC. Develop a MACPAC download for the material specifications (a.k.a. Document classes) and descriptions. Map file to associated 'Document class' attributes in CPC. Import the file to CPC. Standards department to manually edit imported records and apply missing attributes inside CPC as necessary to comply with existing CPC standards requirements.

3.2 CPC AND MACPAC INTERFACE

The interface is assumed to be limited to STANDARD (non-spec material) and RAW material parts (This excludes in yard designed parts and purchase spec parts). The interface further assumes that there will be NO data format changes to existing Standard parts in MACPAC and that no new screens or modifications of existing MACAPC screens.

Design and develop an interface between CPC and MACPAC. This requires development of an export file from CPC such that part master adds, changes, and deletes are accomplished using batch method similar to the TRIBON-MLMS-MACPAC interface. To process CPC records ISD will create and/or modify system interface (SIF) transactions for MACPAC part master attributes. SIF transactions to include DEMAIN, DETEXT, DERM, and XFTEXT. Add edit to MACPAC to prevent add/change/deletes to a 'CPC' controlled part master, develop input reports and exception reports as required and perform testing throughout project as required.