

Title Page

Casting Solutions for Readiness

Integrated Casting Order Network (ICON) Portal

09/30/2017

Non-Ferrous Founders' Society

Jerrod Weaver, Program Manager

Abstract

The Non-Ferrous Founders' Society (NFFS) is a 501(c)6 not-for-profit trade association that represents the non-ferrous foundry industry in the United States and Canada. NFFS is part of the American Metalcasting Consortium (AMC), which is a DLA ManTech funded program that provides the expertise and resources that are essential to the sustainment of a domestic metalcasting supply base that provides superior and affordable cast components to ensure warfighter readiness. The current NFFS projects aim to address the lack of visibility and response regarding metal castings in the DLA's supply chain.

Castings represent a significant portion of backordered parts in the current procurement system according to DLA supply centers. This is often due to fragmented supply chains that arise from a lack of understanding of underlying manufacturing processes and where to source qualified contractors, lost or unknown tooling locations, and a diminishing domestic manufacturing supply base. The result is increased lead-times, higher costs, creation of unnecessary duplicate tooling and a reduction in supply chain readiness. The Integrated Casting Order Network (ICON) Portal was designed to address these issues and to provide solutions using the following functionalities in one convenient internet portal:

- Automated Solicitation Matching and Distribution – a customizable Inbox for ICON users containing DLA solicitations that match the users Bid-Matching Settings. The portal will identify bid solicitations that contain a metal cast component via the FLIS dataset and match it to potential suppliers based on their bid matching settings and provide it to them via their Inbox. The Inbox allows users to quickly and easily sort through bid solicitations and view any solicitation details and technical data package information associated with the solicitation.
- Bid Matching Settings – allows ICON users to input their company manufacturing capabilities and to update their defense related tooling records within the ICON portal, to allow the system to match bid solicitations to their capabilities. Companies may include capabilities such as materials cast, casting processes utilized, minimum order quantity and minimum estimated contract values.
- Defense Tooling Locator – an online searchable database which enables a buyer or contractor to identify and locate tooling for defense castings that currently reside in prime contractor and sub-tier metalcasting facilities, thus eliminating the cost of duplicating tooling and reducing administrative and production lead-times for part acquisition.
- Defense Casting Supplier Database – a comprehensive database of metal casters that can be queried by alloy, casting process, business and federal classifications and other relevant capabilities. The database will enable DLA personnel and defense contractors to quickly identify qualified casting manufacturers by searching plant capabilities and technical specifications.

By implementing a suite of functionalities and features in one convenient location for DLA contractors and metalcasting suppliers to use, the quality and quantity of industry response from industry to the DLA increases dramatically. These efforts are being transitioned into industry by incorporating these items into the ICON portal, and by increasing the number of foundries using the ICON portal to find and fulfill DLA bid solicitations for castings.

As of September 2017, there are over 350 metal casters enrolled in the ICON Portal who possess more than 23,000 pieces of tooling for confirmed National Stock Numbers for Defense and Military components. On average, approximately 390 DLA bid solicitations that contain cast metal components are directed to capable metal casters, valued at over \$6,200,000 per month. Actual contract awards made to ICON users average more than \$1,000,000 per month, and continue to increase in number and value. Considerable cost savings on contracts awarded to ICON users have been documented, and the ongoing cost savings generated by the ICON portal for metal casting contract awards are now being included in DLA Cost Savings Reports for both the DLA Aviation (Richmond, VA) and the DLA Land and Maritime (Columbus, OH) Supply Centers.

Introduction/Background

The United States federal government is the world's largest buyer of supplies and services, and of the 50 federal government agencies that make these purchases, the largest buyer continues to be the Department of Defense (DoD). The buyers within the DoD are the military services (Army, Navy, Air Force, Marine Corp.) and the Defense Logistics Agency (DLA).

The DLA supplies the US military services and several civilian agencies with logistical support including the acquisition of spare and replacement parts for weapon systems, many of which contain metalcasting components. The DLA and its supply centers face complex challenges regarding the procurement of spare part metal castings in a sustainment environment. Metal castings represent a high proportion of DLA backorders, delays, and elevated component costs. In fact, DLA Supply Centers report that castings contribute a significant portion of the backordered parts within the current procurement system. This is often due to gaps in the supply chain that arise from a lack of visibility of defense related tooling, and a lack of visibility of casting suppliers and their manufacturing capabilities. Combined with a diminishing domestic manufacturing supply base providing a lack of responses to solicitations, this has significantly impacted both administrative and production lead times as well as increased costs for acquiring spare and replacement cast metal components by the DLA.

To solve these supply chain issues, the DLA needs business-process and procurement tools that are complimentary to present DLA procurement methodologies to improve the supply of cast components. These tools can help ensure that capable metal casting suppliers can respond rapidly to DLA bid solicitations and deliver quality parts on time and at reasonable cost. To this end, NFFS proposed a web portal for defense contractors and DLA procurement staff to simplify and expedite the procurement process for metal castings. The ICON Portal addresses two primary problems, the creation of duplicate defense related tooling and the lack of responsiveness of the metal casting industry.

Tooling

Each time a contract award is made that involves a metal casting, the contractor will purchase the metal casting (if not a foundry themselves) to satisfy the requirement for that part or assembly. However, the contracted foundry may or may not have existing tooling for that part. As a result, new patterns are often constructed, and the tooling and qualification costs are passed on to the prime contractor, who in turn passes the cost to the government. Consequently, DLA duplicates millions of dollars of patterns and related tooling each year to produce components that have previously been manufactured, and for which tooling already exists.

The defense tooling database was created as part of the AMC PRO-ACT program, and is a web-accessible tool for casting suppliers and DLA buyers to source existing foundry tooling and component suppliers. The database enables buyers to identify existing supply chains which minimize costs, lead-times, and risk in the procurement process. NFFS cataloged more than 16,000 patterns applicable to 350 weapon systems in the database by the conclusion of the PRO-ACT program, but this did not represent the total population of existing patterns. As the scope of the database program grew, so did the responsibility of maintaining the data to ensure that the information was accurate.

The overall benefit of this element to DLA is improved supply chain reliability for both short-run and high volume cast components that are critical to weapons system sustainment. In the absence of further development and maintenance of this program, the value that this program provides to DLA is reduced from year-to-year as the validity of the database is dependent upon the integrity of the data. The tooling database has already provided DLA with lead-time and cost reductions, in addition to best value source selection, for many problem parts. These lead-time and cost savings will continue to accumulate as the database grows in terms of number of patterns, suppliers, and users within DOD procurement activities.

Industry

Each time a solicitation is released, not only must an appropriate foundry be made aware of the solicitation, but they must also have an ability to quickly and efficiently evaluate their ability to manufacture the required component. This is accomplished by improving the procurement model for suppliers at each step in the process. In order for suppliers to bid, they first must be aware of the solicitation. Currently, this requires any potential DLA supplier to log into the DLA Internet Bid Board System (DIBBS) website and search solicitations either by a given NSN or by looking through all RFQ's released from DLA regardless of material and process requirements. Once a supplier locates a potentially relevant RFQ, they must then log into Product Data Management Initiative (PDMI) website in order to obtain the technical data packages associated with the RFQ. If the supplier determines that they can manufacture the item, and actually want the business, they must finally return to the DIBBS website in order to formally submit their bid.

This entire process puts a tremendous burden on suppliers that want to become involved in the DLA supply chain. Regardless of how opportune any given RFQ may be, if a supplier is not provided with the means to quickly and easily identify relevant solicitations, and to evaluate the RFQ in a timely manner, many times suppliers may decline to provide a quotation in response. As the time commitment required by foundries to identify, review, and bid on solicitations decreases, the number of suppliers bidding on active solicitations will increase, ultimately driving down the total cost of replacement parts to the DLA by increasing competition and by eliminating the cost of duplicated tooling.

Experimental Procedure

Included in the ICON portal development program was a suite of features, functionalities and user interface upgrades provided in one convenient website in order to encourage current defense contractors, as well as potential future metalcasting suppliers, to become involved in the DLA supply chain. The development included additional administrative functions that greatly increases the efficiency and effectiveness of the portal, and provides a methodology for the ongoing sustainability of the ICON portal. A summary of the portal improvements includes:

- **Bid Matching Settings:** a two-fold system to first monitor current solicitations via their FLIS data and determine whether a casting is an integral component of a part being solicited as well as any specified casting process or material. The second step of the process directs the solicitations to appropriate casting suppliers. In this sense "appropriate" casting suppliers are solicitations in which the material, casting process, order quantity and estimated contract value, match the supplier's Bid Matching Settings. These settings can be changed by the user at any time to reflect current company capabilities and capacity;

- Daily Notification Emails: an automated daily email to all ICON users supplying them with a number of available DLA solicitations that match the user's bid matching settings, as well as the total estimated value of the potential contract. This email also provides the user with a convenient link to the ICON Portal so that they can view the matching solicitations;
- Customizable Inbox: a webpage populated with current DLA solicitations that match the user's bid matching settings. This page provides users with 50 solicitations per page with information such as NSN, quantity, estimated contract value, part number, description, material and casting process required. In addition to providing "at a glance" information for metal casting solicitation, the NSN for each solicitation contains a hyperlink to bring the user directly to the solicitation details page;
- Solicitation Details with Technical Data Packages: a webpage specific to each DLA solicitation containing all of the information provided on the Inbox page as well as the rest of the solicitation details from the FLIS data. This data includes procurement history, recent solicitations of the same NSN, item description, packaging information as well as a links to download any and all technical data packages associated with the NSN. Additional OEM licensing agreements such as Boeing Rights Guards are also available for download whenever they are required to view a specific technical data package;
- Defense Tooling Locator: an online searchable database which enables a buyer or contractor to identify and locate tooling for defense parts that currently reside in prime contractor and sub-tier metalcasting facilities, thus eliminating the cost of duplicating tooling and reducing administrative and production lead-times for part acquisition;
- Defense Casting Supplier Database: a comprehensive database of metal casters that can be queried by alloy, casting process, business and federal classifications as well as a variety of other relevant factors. The database will enable DLA buyers and defense contractors to quickly identify qualified metal casting manufacturers by searching plant capabilities and technical specifications;
- User Tutorial Videos: a compilation of tutorial videos designed to assist potential DLA suppliers in obtaining the necessary credentials in order to do business with the government. In order to evaluate and bid on any given DLA solicitation, a supplier must be registered with SAM.gov, obtain a Commercial and Government Entity Code, as well as register an account in DIBBS and PDMI. Tutorial videos designed to help users register on each of the required websites and systems are easily accessible on the ICON website;
- Standard and Specification Database: a database of casting related industry standards and specifications that can be queried by name, description, or authoring body. After a search is performed, the user is prompted with links to websites where the standard can be viewed, downloaded, or purchased depending on the authoring body;

- Additional Texts and Hints to Users: a collection of helpful tips, text and links to support videos and contact information, designed to improve the user experience and train users in the most effective ways to utilize the portal functionalities;
- SuperAdmin Backend Functionality: provides the site administrator with the ability to quickly query and identify users with specific credentials, profile parameters, and usage patterns to send specific communications and documents to those users. This greatly increased the ability of the site administrator to communicate with portal users and minimized the number of keystrokes required to do so;
- Subscription Technology Software: a ready to deploy portal update that can be enabled upon request to begin a subscription based web model for ICON operations. Government and Military users will be granted permanent, unlimited and free use of the portal by permanent license if and when this technology is implemented. This provided a method for future revenue generation to allow the portal to sustain its operations. The portal will remain free to all industry and government users so long as that operations model continues to be sustainable.

Results/Discussion

Due to the ICON Portal and its enhanced user interface, the time commitment for the metal casting industry to identify relevant DLA bid solicitations and to respond to the RFQ has been reduced dramatically. The result of this has been an increase in the visibility of DLA solicitations by potential suppliers, a decrease in the number of duplicated defense related tools, a decrease in administrative and production lead time, and ultimately a decrease in part cost to the DLA. As these trends are all correlated, quantifying the change in part cost and lead time is an appropriate way to measure the effectiveness of the ICON Portal as a whole. A selected few weapon systems have been studied to measure this. Examples include:

- Kovatch Casting in Uniontown, Ohio, learned of an open solicitation for a H-60 helicopter part from the ICON Portal. The foundry pursued the solicitation as a prime, submitted a quote, and was awarded the contract. The contract was for 1,000 parts and the foundry quoted \$170 per part less than the previous supplier for a direct cost savings to the DLA of \$170,000 on just one order;
- C&L Aluminum in Ft. Worth, Texas, received 14 repeat orders in four months. By utilizing existing tooling, the procurement system was able to re-establish supply chain contacts that had previously been broken. In terms of cost savings, the average price per part was 13% less than the last time the part was procured. Multiplying the cost decrease by the quantity, cost savings were as high as \$8,000 per order and does not include the cost avoidance resulting from the use of existing tooling for the repeat orders;
- Due to increased visibility of the DLA solicitation within the ICON portal, a NSN used in the Catapult/Arresting Gear on the Forrestal CV, Wasp LHD, and Nimitz CVN class aircraft carriers was reduced in both price and lead time. After ICON directed the

solicitation to its user base, the subsequent contract lead time was reduced by 233 days and total cost per part was reduced by 10% compared to previous purchases.

One of the primary goals of this project was to encourage the industry segment that had previously not considered government work to become active in the supply chain. The ICON portal improved the contractor experience which is a critical component in the success of the ICON portal. Throughout the program, testimonials from industry were received that demonstrate their perception of the ICON Portal. Among the comments received by NFFS:

- *"[We] specialize in high grade aluminum castings for military applications. Through ICON we receive new opportunities every day to bid on that we are capable of producing. This user-friendly system provides an abundance of critical procurement data and it's a must have for foundries seeking government work."*
- *"I would like to take a moment to thank you for [ICON] information you have been sending us. It's really overwhelming how many opportunities [ICON] has given us so far! I have been calling and following up with a number of products we don't have the tooling for, and it has given us new opportunities with new customers. I have appointments set up to visit a few of these customers in the very near future. Thanks again!"*
- *"I've enjoyed using the ICON portal. I love how all of the information is in one place and easily accessible. The ability to print the specs, drawings and solicitations from one easy to use interface helps save me time in my day and enables me to get quotes into the DIBBS website in a more timely fashion."*

In addition to the verbal response from industry, other, more quantifiable metrics regarding the ICON Portal were also observed. As of September 2017, there are over 350 metal casters enrolled in the ICON Portal who possess more than 23,000 defense related tooling records. On average, approximately 390 DLA bid solicitations that contain cast metal components are directed to capable metal casters, valued at over \$6,200,000, per month. Actual contract awards made to ICON users average more than \$1,000,000 per month, and continue to increase in value.

Summary of Work / Conclusions

The Integrated Casting Order Network Portal for metal castings has been established as an important resource that connects the DoD's part acquisition needs to the metalcasting industry. The effort has significantly improved supply chain reliability, reduced costs and delivery lead times, and has increased readiness and sustainability for warfighter support. The elements of the portal (all web-based) are:

- Bid Matching Settings
- Daily Notification Emails
- Customizable Inbox
- Solicitation Details with Technical Data Packages
- Defense Tooling Locator
- Defense Casting Supplier Database
- User Tutorial Videos
- Standard and Specification Database

The program enhances DLA's ability to rapidly and cost-efficiently procure parts for aging weapon systems. The program also increases DLA's visibility beyond the OEM/Prime to the full spectrum of the supply chain which provides the ability to efficiently resolve vendor issues. Furthermore, the program allows DLA to recall casting process models, so that older items, which have not been made for a number of years, can be put back in production quickly with minimum risk. Overall, the program has consistently demonstrated persuasive supply chain solutions that can be emulated for other manufacturing processes that are critical for military weapon systems support.

The ICON Portal program has been implemented by both industry participants and government procurement personnel. The tooling and supplier databases are utilized at the DLA Supply Centers in Columbus, Ohio and Richmond, Virginia, and several Army, Navy, and Air Force facilities across the country. In addition, the ICON portal is instrumental in assisting the AFCAT/MetalFACT teams (DLA forging and casting engineering teams) with vendor support and tooling inquiries. Recent cooperation between NFFS and the DLA has also resulted in the development of an automated cost reporting system to identify cost savings generated by the ICON portal users and integrating these cost savings into the DLA cost savings reports.

In addition, the program provides DLA the resources for rapid and cost efficient procurement for spare part acquisitions to support the warfighter. The benefits of this program, based upon actual procurements are:

- 1,779 DLA contracts issued to ICON users from July 2015 to September 2017;
- \$25,000,000 cumulative contract value awarded to ICON users from July 2015 to September 2017;
- Visibility of 350 foundries with tooling for 23,000 cast parts used on more than 4,000 weapon systems;
- Up to 44% of total available DLA contracts containing a cast metal component being awarded to ICON users per month;
- Increased mission readiness and reduction in weapon system downtime;
- Increased number of bids – reduction in 'no bids' to open DLA bid solicitations that contain a metal casting;
- Strengthened domestic supply base to maintain defense readiness and sustainment.
- Generated additional cost reductions, not included in the cost savings amount stated above, through the facilitation of direct-to-foundry procurement. (Many foundry facilities have the capabilities to manufacture and supply finished parts more quickly and at a lesser cost than traditional multi-tier supply chains.)

Ultimately, the ICON portal has provided a valuable solution that links capable metal casting suppliers with the procurement needs of the DLA, resulting in reduced costs and lead times for

these difficult to procure items. As the number of suppliers in the ICON portal increases, and the number of military related tools are identified within the casting industry, the effectiveness of the ICON will continue to increase. Future efforts include increasing the number of foundries using the ICON portal to find and fulfill DLA bid solicitations for castings, and continuing to add to the defense tooling database as additional defense and military related tooling is discovered within the industry.

Acknowledgements

"The AMC program is sponsored by the Defense Supply Center Philadelphia, Philadelphia, PA and the Defense Logistics Agency, Ft. Belvoir, VA."