STANDARDS TO SUPPORT INTEROPERABLE SIMULATION

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Abstract

With the push for the Modeling & Simulation (M&S) community to move to the High Level Architecture(HLA) the Distributed Interactive Simulation (DIS) organization saw a need to expand the scope of the standards activity and opportunity to be more inclusive. In response, DIS has transitioned to a new structure and taken positive steps to reach out and inform non-traditional elements of the Modeling and Simulation community of the need for public standards to support M&S interoperability and the opportunity that will exist for them to participate, as well as the need. An initial focus for developing new standards is the DoD High Level Architecture.

The new organization is called the Simulation Interoperability Standards Organization (SISO). Its purposes are to develop standards that facilitate simulation interoperability, provide educational and technical interchanges, and share knowledge and experiences between participants having common interests. SISO has been organized along two functional lines, one focuses on standards development and the other on conducting workshops and conferences which are guided by an Executive Committee. One component is the Simulation Interoperability Workshop(SIW) which provides bi-annual meetings where members of the M&S community come together to discuss new ideas, concepts, and technology across the broad M&S community; to disseminate these ideas; to educate M&S practitioners and sponsors regarding their implementation; and to support the development of standards, practices, and guides for use in various applications. The other component of SISO, the standards development activity, is responsible for the development of the standards needed to promote and support interoperable simulation.

This paper will describe the above organization, provide a report on the status of new standards that are evolving and on future SISO goals.

ACQUISITION REFORM AND STREAMLINING - A CASE STUDY

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INTRODUCTION

The New Attack Submarine Ship Control Operator Trainer (NSCOT) will be developed for the Naval Air Warfare Center Training Systems Division (NAWCTSD) under a Cost Plus Award Fee contract. The NSCOT will functionally replicate the NSSN ship control subsystem and will provide the capability to familiarize personnel with ship control subsystem operations and conduct ship control team training under realistic operating conditions.

The NSCOT will consist of a motion platform that is driven by hydrodynamically correct simulation software and will include the following hardware functional areas.

a. Ship control operations
b. Instructor control
c. Digital computer system
d. Cab enclosure and platform motion
e. Communications
f. Sound effects

The procurement approach used for the NSCOT differs significantly from previous, similar acquisitions. This paper presents a case study of the many acquisition reform and streamlining initiatives used prior to award for the contract of the NSCOT.

PROBLEMS WITH PAST ACQUISITION PROCESSES

Previously, there were many problems with procurements at NAWCTSD. Some of the problems were due to Department of Defense (DOD) instructions, some due to internal processes and others due to an innate sense of distrust of Industry, the old "them versus us" syndrome. Many of these problems were formed under the previous Defense culture, where money was in abundant supply. All of that is rapidly changing now , but some of the problems that were encountered are as listed in the following paragraphs.

Extensive internal review cycle - NAWCTSD had very extensive review processes where all procurement documentation was reviewed and then re-reviewed. The processes used were attempting to review in the quality of the product.

Extensive proposal evaluation - Evaluations of proposals were quite extensive and tedious. Proposals were massive. Many non-critical items were evaluated in the proposal as well as items that should not have been set in concrete up front. Such items as computers, size of hard drives, brands of monitors, etc., were discussed in the offeror's proposal. By incorporating the proposals into the contract, those items became a contractual requirement. If a better system appeared to do the job at a comparable cost, a modification to the contract had to be done. This caused a great deal of paper work on both the Government's and Industry's side.

Restrictive requirements - Procurements at NAWCTSD over defined the trainer processes and design. The method of providing the trainer was specified and not the outcome which was desired. The use of military specifications and standards was not only encouraged, it was mandatory. Industry/Government partnerships were discouraged, which lead to precise, exacting, restrictive requirements.

Too many data items - Hand in hand with restrictive requirements, over specifying data items was frequently done. NAWCTSD procurements simply asked for everything, regardless of it's value to the development of the trainer or its long term support. By buying every conceivable data item, every possible data need was sure to be covered, but some of this data was not necessary to the long term program needs.

Unknown tradeoff variables - The offeror did not have a full and complete understanding of how NAWCTSD would evaluate the data in their proposal, so ultimately they put in everything possible, wasting precious resources on both the

Industry and Government sides. By streamlining the content of the offeror's proposals to require only what the Government considered as critical, the tradeoffs between cost and performance become more clear and meaningful.

ACQUISITION REFORM SOLUTIONS

Because of the ever decreasing Defense dollar, the competition for DOD work has increased significantly, not only on the Industry side but on the Government side as well. There are several different Government organizations competing for the same type of work. Computer technology is changing at a rapid pace, where it is not uncommon for a computer to be obsolete within two years. The decreasing budgets, the fast changes in technology, and the competitive atmosphere necessitated a need for a faster procurement process and a less restrictive design approach.

With the issue of the Federal Acquisition Streamlining Act (FASA) of 1994, the Mandate For Change handed down from Secretary of Defense Perry to the House Armed Services and the Government Affairs Committee in February 1994, and numerous other acquisition reform initiatives, the DOD acquisition process was changed forever. Military standards and Specifications were greatly reduced, and the need for acquisition reform was not only encouraged, but required.

At NAWCTSD, the NSCOT team embraced acquisition reform and streamlining in their procurement approach and came up with solutions to the numerous problems with past acquisition processes. The following are a few of the reform solutions used in the NSCOT procurement.

Empower Team by getting management involved up front - This was by far the most important step of the acquisition reform process. Management must be involved up front. Management must buy into the reform initiatives and be supportive of them. Management must be willing to change, to take risks, to change processes that currently work, to create strife within certain areas in the organization over the breakup of rice bowls, and to be willing to tailor procedures according to each specific procurement. Management must create a horizontal team structure where vertical elements are removed through empowerment. Changes to procedures and processes must not be set in stone for all procurements. Every procurement must be individually evaluated as to type of procurement, type of funding, technical difficulty, etc., to ascertain which reforms will apply and which are not feasible. All acquisition reforms must not be applied to all procurements without due consideration of many factors. Some simply make no sense. A unique, tailored procurement process is necessary to efficiently procure each unique, tailored system.

Evaluate only factors critical to award and ensure Offerors understand how proposals will be evaluated - As an acquisition reform initiative, NAWCTSD decided to be very up front with the Offerors and let them know how their proposals will be evaluated. In section M of the RFP, a detailed matrix for each rating subfactor was presented that showed what the offeror would need to provide in their proposal to receive a specified rating. If the subfactor in question was a "provided/did not provide" answer, the answer being expected was given. If the offeror was to show, for example, availability, an equation was given which the offeror was to use to calculate their design's availability.

Only critical factors were requested in the proposal. Critical factors are factors that are required and their failure to comply, or omission, would be a reason for non-award if they were not proposed as specified in the TSRD. NAWCTSD did not ask for the non-critical information, which, while important, did not add anything to the decision making process of selecting the offeror's proposal that had the "best value." Such information as brand of computer, size of hard drive, brand of monitors, color of paint, or information on any other specified requirement, were not asked for because they were not relevant to award and took up a great deal of time in the evaluation process. The proposal was evaluated to make sure it contained cost elements for both critical and non-critical factors under the evaluation of the validity of scope of work.

Improve communication with offerors - For the NSCOT procurement, communication with potential offerors prior to RFP release was a significant reform. Not only were two drafts of the RFP released for comment, but they were released on the World Wide Web. The final RFP was also released on the Web. This saved a great deal of time and expense for both Government and Industry.

An industry brief was held for all potential bidders

and individual briefs were held with interested companies. In addition, funding data was released in the draft and final RFP, and all evaluation criteria were listed as previously mentioned.

Use Integrated Product/Process Team (IPT) process to Manage Contractor s development - The use of IPTs helps to eliminate formal reviews such as preliminary and critical design reviews. By using an IPT approach to design, all members of the design team for the trainer are represented in the decision making process. Each specific IPT focuses on its specialty area. This IPT design approach leads to an incremental development approach where all design decisions are made concurrently and not necessarily in a serial fashion. This eliminates the wait for final approval at CDR before beginning critical development (if that IPT has already agreed which design approach to take).

Reduce RFP Elements - The size of the RFP was reduced by eliminating many of the traditional elements such as Specification, SOW, APPENDICES, and CDRLS. The NSCOT procurement used a Trainer System Requirements Document (TSRD) instead of a specification, and incorporated the statement of work (SOW) information into section C of the contract schedule. This simplified the preparation process and eliminated conflicting requirements and also increased efficiency. The winning Contractor shall provide a specification shortly after award with more detail than the TSRD.

Instead of the RFP including DD form 1423 Contract Data Requirement Lists (CDRLs), the RFP requested that each prospective offeror provide the CDRLs which it felt was necessary to fulfill the requirements of the RFP. The list of CDRLs provided in the proposal corresponded to the Integrated Master Schedule that the offeror provides as part of their proposal.

Instead of a Contract Schedule being dictated in section F of the schedule, a schedule was provided by the offerors, as part of their proposal, and after evaluation and selection of best value proposal, will be incorporated as part of the contract.

HOW THE REFORMS WORKED

Many of the reforms worked the way we thought they would, by making our job and the offeror's job easier. Some of the reforms worked, but added additional time to the evaluation process. Some were disappointing in their results. The specific reforms that were implemented are listed and expanded upon below.

Offeror Submitted CDRLs - One of the reforms was having the offeror propose the data requirements for the procurement. This approach added a great deal of time to that normally required by both the Industry and Government sides. Industry because of the additional effort required to plan and submit the CDRLs, and the Government because, by having the offeror provide the CDRL DD1423 forms with his proposal, the evaluators had to not only review the proposed data for completeness, but also had to review each form for format, time of submittal, etc. The offerors had to provide a fully integrated solution and the Government had to make sure that the proposed fully integrated solution was appropriate and complete. A lesson learned from this initiative was to make sure that only current Data Information Descriptions (DIDs) or contractor format are proposed.

Validity of Proposed Scope of Work - Another item that was added to this procurement was Validity of Proposed Scope of Work. This type of information had not been requested before at NAWCTSD for this type of procurement. Evaluating the scope of work proposed against the actual work intended was very time consuming. However, it did provide invaluable information.

Using TSRD Vice Specification - In the case of the NSCOT procurement, the use of a TSRD instead of a specification saved a lot of headaches. The delivery of the trainer is scheduled to beat the delivery of the first NSSN by two years. Because of this time difference, the specific requirements details were simply not known at the time of RFP and proposal. This is why a cost plus type contract was used. The winning offeror is required to submit a specification shortly after contract award. That specification will be thoroughly reviewed and will then become the baseline for the design of the training system.

Simplified RFP - The RFP was simplified and reduced in size by incorporating the SOW into section C of the Contract Schedule and the TPR into section L reducing the chance of conflicting requirements.

Releasing Funding Data - By releasing the

funding data, the Government was able to ascertain, through contractor feedback, whether the draft requirements were affordable within this budget and whether the funding profile matched anticipated spending needs. The offerors were able to plan their design and development schedule knowing how the funding was distributed. This reform worked well on both the Government and Industry sides.

Releasing Detailed Evaluation Criteria - The inclusion of detailed evaluation criteria in the RFP was perhaps the most time saving item for both Industry and the Government. The Government, though having to have spent more time up front in preparing this detailed information, saved a great deal of time in the evaluation process. There were fewer questions and ambiguities. The Government did not waste time evaluating items that were not critical to the award. Industry saved time by reducing their need for clarifications of the RFP and by reducing their proposal preparation time. Knowing exactly what was required in their proposal instead of guessing enabled them to basically rate their own proposal for acceptability and perform meaningful cost versus capability tradeoffs.

Changing Internal Review Process - Internal processes can be greatly improved and accelerated by eliminating sequential checkpoints and formal reviews. Team members that were previously "checkpoints" were contributors to the development process. To do this, the focus of the process had to be changed from a department focus to a team focus where reasonable discussion and compromise were very important to the acquisition reform process.

Keeping the Program office informed was also very important. When there were changes in development or design strategies and funding changes had to occur, the program office was immediately informed and updated so they could incorporate the necessary changes in a timely manner.

Using Web for Issuing RFP - The use of the Web was very successful. Using the Web shortened publication time of both draft and final RFPs. It enabled a very quick and effective feedback process. Because of the release of two drafts prior to release of final RFP, there were no requests for extensions. The disappointing result of this reform was that it did not appear to increase competition or industry participation, and there were minimal technical comments to the draft RFPs.

Summary of Acquisition Reform Benefits - The acquisition reforms used in the NSCOT procurement, as detailed above, provided the following results.

- Simplified Publication Time (Use of Web)
- Reduced RFP Preparation Time
- Reduced Evaluation Time
- Improved Quality of Evaluation
- Greater Design Flexibility
- Fully Integrated Solution
- Reduced Proposal Preparation time/cost

CONCLUSION

By implementing the above acquisition reforms and streamlining initiatives, the NSCOT team was able to reduce package preparation time, reduce rework, reduce redundancy, reduce conflict of requirements, increase efficiency, increase industry's understanding of the evaluation process, simplify the evaluation process, shorten the evaluation process, and minimize the subjectivity in the evaluation process. The acquisition approach used also crossed boundaries within departments so that the NSCOT team could truly call itself a team and work together for the good of the project.

Many of the reforms and streamlining initiatives can, and should be, used for future procurements, but it is very important to realize that each procurement is as individual as each person and should not be treated as just one more peg going through an assembly line. Each procurement needs to have management involvement up front. Each team needs to truly try to improve all processes each and every time a procurement package is produced. Every procurement team should seek advice from other teams, who have gone through the procurement process recently, to get information on their successes and failures. Every procurement team should compile a list of lessons learned from their acquisition reform experience to share with others.

Applying acquisition reforms to the NSCOT project has provided a unified team, industry and Government alike, to be committed to providing the best value solution for our country's training needs.