Shipbuilding Partners and Suppliers (SPARS) Consortium

Enabling the Shipbuilding Virtual Enterprise
(SPARS is a joint Industry & NSRP funded Project)

AFEI 9/24/2003

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National Shipbuilding Research Program

- Assist the U.S. shipbuilding industry in capturing a significantly increased share of the commercial market

- Improve Warship affordability for the Navy by reducing both acquisition and lifecycle cost

- Preserve the U.S. shipbuilding infrastructure by maintaining the capability to respond to the future demands of military and commercial customers
NSRP Leadership

- Atlantic Marine Holding Co.
- Avondale Industries, Inc.
- Bath Iron Works Corp.
- Cascade General
- Electric Boat Corp.
- Halter Marine, Inc.
- Ingalls Shipbuilding, Inc.
- National Steel & Shipbuilding Co.
- Newport News Shipbuilding
- Todd Pacific Shipyards Corp.
NSRP Structure & Operations

● **Management**
  » Executive Control Board-Shipyards
  » Contracting Agent-Advanced Technology Institute
  » Strategic Investment Plan-SIP (www.nsrp.org)
  » Research Announcements
  » Cooperative Agreements (Not FAR/DFAR)
  » Funding: 50% NAVY-50% Industry

● **Operations**
  » Major Initiative Teams-Drives SIP
    – **Shipyard Production Process Technologies**
    – **Business Process Technologies**
    – **Product Design and Material Technologies**
    – **Systems Technologies**
    – **Facilities and Tooling**
    – **Crosscut Initiatives**
  » Industry Panels-Industry Public Forum
  » Quarterly Reviews
  » Milestones
SPARS Participants

- NIIIP -- Project Manager
- Electric Boat
- NNS
- Bath
- Ingalls
- Avondale
- Todd Pacific
- Leading Suppliers
  - York, Eaton, Marotta, IMO, Lockheed Martin, US Steel,
  - W&O Supply, OVH, Aqua Chem, Leslie
- IBM-Technology
- Alterum-Business Process Re-Engineering
The Shipbuilding Virtual Enterprise is challenged by:

- 20,000+ Shipyards and Suppliers
- Multiple incompatible Business Processes and IT systems
- Redundant data entry efforts—no shared data between shipyards and suppliers
- Limited IS budgets and expertise, significant investment in human resources to support multiple systems, many manual systems
- Productivity impacted by manual business processes e.g., errors and delays in dissemination of information from manual/paper based systems
SPARS Value Proposition

Provide a **collaborative forum** for shipyards and suppliers to develop and implement improved inter-organizational processes

**Re-engineer** shipyard-supplier business processes to remove paper, reduce labor content, and reduce cycle time.

Standardize processes/interfaces where appropriate and **re-use results** across multiple shipyards and suppliers to minimize costs and risks.
Shipyard-Supplier Process Flow-Before

Supplier 1 Processes
Supplier 2 Processes
Supplier 3 Processes
Supplier 4 Processes

Supplier 1
Supplier 2
Supplier 3
Supplier 4

Yard 1
Yard 2
Yard 3
Yard 4

Yard Processes
Yard Processes
Yard Processes
Yard Processes
Shipyard-Supplier Process Flow-After

Supplier 1 Processes

Supplier 2 Processes

Supplier 3 Processes

Supplier 4 Processes

Yard 1 Processes

Yard 2 Processes

Yard 3 Processes

Yard 4 Processes

SPARS Virtual Enterprise Server
Facilitates rapid and effective partnering amongst the US Shipbuilding Community for rapid response

An open common infrastructure which is replicable and reusable across many users and projects reducing start up costs
  » Not Point-to-Point--Not “One Off”--Not Proprietary

Minimizes reconfiguration costs by protecting legacy systems

Information is captured once and used many times reducing overall costs, reducing errors,

Shipyards are VE Gateways to the supply chain
  » Near “Turnkey”

Secure and easy to use Internet based access
SPARS Services

NIIIP SPARS Virtual Enterprise Servers

VE SERVER
- Association of Business & Technical Data in Bid Management Process
- Workflow management of complex multi-tier process
- Support of standards based business transaction formats via the WEB
- Technical data exchange services
- Collaborative tools

WEB Browser

Shipyard
- Ability to establish Ad Hoc relationships for data exchange without extensive service infrastructures

Supplier/Sub
- Ability to do business without obtaining specialized software

Secure Web Server

WEB Browser

Customers
## SPARS Structure

### SPARS Virtual Enterprise Server

<table>
<thead>
<tr>
<th>Vendor Furnished Info</th>
<th>RFP RFQ</th>
<th>Vendor Info Request</th>
<th>Auction Reverse-Auction</th>
<th>Vendor Drawing Review</th>
<th>Vendor Registry</th>
<th>Vendor Process Request</th>
<th>Vendor Time &amp; Material</th>
<th>Vendor Expedite</th>
</tr>
</thead>
</table>

### SPARS Server Base

Desktop (JSP), Security (SecureWay), Doc Mgmt, Directory (LDAP), Process Mgmt

### E-Business Middleware

WebSphere Application Server, DB2/UDB, MQSeries, Web Services, XSLT

### Multiple Business Processes on a single base

- **Shipyard**
- **Supplier**

9/30/2003
SPARS Architecture

**CLIENT**
(At Supplier or Shipyard)

**FIRST TIER**
Desktop Functions (Browser)

**SECOND TIER**
WebServer
SERVLET/JSP
SERVLET
Application Server
Process Mgt. & EJBs

**THIRD TIER**
WebServer
SERVER Functions:
IBM WebSphere, Process Mgt.,
People Directory, Doc Directory,
Doc Repository, Encryption
Business Processes:
VIR, VBID, VFI, VPA ....

**VES**

**SHIPYARD**

Firewall
Data Server
Directory/Repository

Legacy Applications:
ERP, PDM, MRP

Legacy Applications:

Desktop Functions:
- Business Forms
- Workflow Activities
- Documents/Folders
- Authentication

Internal Processes
Legacy Applications

Firewall
SPARS Security

VES

Supplier A

HTTPS (SSL – FIPS)

Supplier B

HTTPS (SSL-FIPS)

IDS SRV

WEB SRV

LDAP DIR

Process WKflow SRV

Process

Data Store

userid pw certificates

Data Store

APP SRV

WEB SRV

WebHost

VIS

Gotcha

Legacy Process

WEB SRV

Encrypted T1
SPARS Business Processes

- **Owner-Operator**
  - RFP
  - Proposal
  - Award
  - Delivery to Owner-Operator

- **Shipyard Pre-procure**
  - Team Build
  - Source Select

- **Shipyard Procurement**
  - Buy, Process Manage

- **Shipyard Construction**
  - Sustainment

- **Suppliers**
Pre-Procurement Processes
Vendor Furnished Information (VFI)

Procurement Processes
Vendor Bid (VBID) - Develop proposals and generating supplier responses for engineered parts and components, Auction/Reverse Auction
Vendor Quote (VQUOTE) Web enable selected legacy procurement processes

Contract Management Business Processes
Vendor Information Request (VIR) - suppliers request information or non-conformances associated with material on purchase order.
Vendor Procedure Approval Request (VPAR) - Supplier procedures ie: welding, NDT, etc.
Vendor Time and Material Request (VTMR) - Time and Material accounting
Vendor Drawing Engineering Review (VDER)
Vendor Expediting (VXPD) Manage the schedule and delivery process

Sustainment
Condition Report (CR) A process to communicate ship repair requests from operational ship to shipyard
Life Cycle Management
Full Service Contracting
SPARS at General Dynamics Electric Boat
Vendor Information Request (VIR) Challenge Problem

Supplier Initiated
  » Change
  » Interpretation

Scale and Scope
  » A Multipart Carbon Form
    – Multiple levels of review and approval-Including USN
    – Interface to legacy Systems and Processes
  » Seawolf Class
    – 25,000 +
    – 90 Days Cycle time
    – $1,500 + Cost
    – Tracking and management issues
      ● Current
      ● Historical
Suppliers Login to the SPARS VES using Internet Explorer Browser
Suppliers are invited to participate by the Shipyards
There is no “Public” access
Para 119: EXPORT CONTROL OF TECHNICAL DATA

(A) Documentation associated with our end product, submersibles, (including but not limited to drawings, sketches, specifications, diagrams, models) discussions, telecon, or any other transfer of information, whether verbal or written, are considered to be technical data for export control as outlined in Title 22 Code of Federal Regulations Subchapter M, International Traffic in Arms Regulations (ITAR), Part 120 ET AL.

(B) Seller is solely and expressly responsible to insure that any dissemination of such “technical data” is accomplished in accordance with Purchase Order requirements and ITAR and that all requisite export and/or offshore procurement licenses are obtained. Failure to comply with these requirements may lead to civil as well as criminal penalties.

(C) Seller is also responsible for highlighting these legal requirements to all lower-tier subcontractors and to flow down these obligations through their terms and conditions.

(D) Refer also to the requirements of clause 118 (NAVSEA 5252.227-9101, Transmission Abroad of Equipment of Naval Ships) paragraph (b) which address approval requirements for other than NIIIP.
### Suppliers VIR Creation Screen

**Actions**
- Save
- Submit
- Add POLI
- Add Attachments
- Delete VIR
- Get Printable
- Help
- Help Contacts
- Cancel Changes

**VIR**
- **Supplier ID:** 0000008
- **Contact Name:** Kim Kiely
- **Contact Phone:** (800)453-3049
- **Disposition Date:** 06/24/2003

**Purchase Order:** PPG029-006
**Line Item:** 0001
**Part Number:** 23-00-2033
**VIR Qty:** 19
**Next #:**
**Serial #:**

**Reason:** Specification Change
**Material Status:** In Progress
**Drawing Reference Number:** H645-2034

**Description of the Problem:**
This is the field where the supplier identifies their problem or question. A VIR can contain up to 10 different PO line items provided they share the common problem/question. To add another POLI click on the button to the left which notes Add POLI.
After clicking “Browse” from the creation VIR screen, multiple attachments may be added
Completed VIR form with attachments ready for submission to EB
Supplier Desktop reflects all documents they have created. Supplier can choose to see only those submitted and in progress, or look up completed VIRs.
Green Shaded area reflects data returned from EB to the supplier from our legacy systems
EB Internal VIR Processing

VIR PROCESSING

VIR To Do List
VIR Inquiry Only
Administrative Reports

- Return to EB Desktop
- Electric Boat Home Page
- SPARS

EB Internal Workflow Process--User’s Homepage
This is the Users home page where all applications a user has access to are visible on the gray process bar.

Shipyard Personnel or Suppliers would see only those applications they have authorization to use.
“Pop-Up Windows” allow the using community to view pertinent legacy system data without leaving the VIR application.
### View VIR Route Sheet

**VN096-001**
CRAFT MACHINE WORKS INC.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>1.0</td>
<td>VIR Coordinator</td>
<td>VIR Coordinator</td>
<td>Initiate</td>
<td>04-06-02</td>
<td>04-05-02</td>
<td>04-08-02</td>
<td>04-09-02</td>
<td>Complete</td>
<td>1</td>
<td>2</td>
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<tr>
<td>2.0</td>
<td>Herbert Segal</td>
<td>Technical Supervisor</td>
<td>Approve</td>
<td>04-09-02</td>
<td>04-09-02</td>
<td>04-16-02</td>
<td>04-09-02</td>
<td>Cancelled</td>
<td>5</td>
<td>3</td>
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<tr>
<td>3.0</td>
<td>Ben Gillis</td>
<td>Technical Supervisor</td>
<td>Approve</td>
<td>04-09-02</td>
<td>04-10-02</td>
<td>04-11-02</td>
<td>04-11-02</td>
<td>Complete</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>3.01</td>
<td>Gary Deal</td>
<td>Commentor</td>
<td>Review</td>
<td>04-10-02</td>
<td>04-10-02</td>
<td>04-17-02</td>
<td>04-10-02</td>
<td>Complete</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>4.0</td>
<td>Berna Medeiros</td>
<td>Material Services</td>
<td>Review</td>
<td>04-11-02</td>
<td>04-11-02</td>
<td>04-16-02</td>
<td>04-11-02</td>
<td>Complete</td>
<td>3</td>
<td>5</td>
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<tr>
<td>5.0</td>
<td>Supplier Quality</td>
<td>Supplier Quality</td>
<td>Review</td>
<td>04-11-02</td>
<td>04-12-02</td>
<td>04-12-02</td>
<td>04-12-02</td>
<td>Complete</td>
<td>1</td>
<td>6</td>
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<tr>
<td>6.0</td>
<td>VIR Coordinator</td>
<td>VIR Coordinator</td>
<td>Review</td>
<td>04-12-02</td>
<td>04-12-02</td>
<td>04-15-02</td>
<td>04-12-02</td>
<td>Complete</td>
<td>1</td>
<td>END</td>
</tr>
</tbody>
</table>
Real Time Metrics

Allows effective management of the process

VIR Progress Report
Summation.

Open VIR's: 267
Current Average Lead Time for VIR Disposition: 7.0 days
(Last 30 days)

Closed VIR's: 1674

Number of VIR's received this week: 81
Number of VIR's closed this week: 49

Department Active Backlogs

<table>
<thead>
<tr>
<th>Dept#</th>
<th>#VIRS</th>
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</thead>
<tbody>
<tr>
<td>323</td>
<td>30</td>
</tr>
<tr>
<td>330</td>
<td>20</td>
</tr>
<tr>
<td>341</td>
<td>32</td>
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<td>355</td>
<td>1</td>
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<td>412</td>
<td>2</td>
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<tr>
<td>414</td>
<td>13</td>
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<td>415</td>
<td>3</td>
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<tr>
<td>421</td>
<td>2</td>
</tr>
<tr>
<td>427</td>
<td>27</td>
</tr>
<tr>
<td>428</td>
<td>31</td>
</tr>
</tbody>
</table>
EB System update to SPARS VES

The SPARS VES notifies suppliers by email of VIR completion within minutes of final disposition.

SPARS VES
Provides the supplier many different ways to look up a VIR created by their company.
Suppliers can view VIR disposition, associated attachments and have the capability to print or download the document.

View of Completed VIR

<table>
<thead>
<tr>
<th>Actions</th>
<th>VIR Results Form - Tracking Number: 101284466012558</th>
</tr>
</thead>
<tbody>
<tr>
<td>Done</td>
<td>EB VIR No.</td>
</tr>
</tbody>
</table>

Status Message: COMPLETED: has received final disposition by EB. No further processing of this VIR will occur.

<table>
<thead>
<tr>
<th>Buyer</th>
<th>Phone No.</th>
<th>E-Mail</th>
<th>CSA</th>
<th>Final Disposition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stephen Bond</td>
<td>(860)433-3072</td>
<td><a href="mailto:sbcnd@ebmail.geob.com">sbcnd@ebmail.geob.com</a></td>
<td>EBC</td>
<td>For Info Only</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Supplier ID</th>
<th>Contact Name</th>
<th>Contact Phone</th>
<th>Req. Disposition Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>584497</td>
<td>Sherry Keiling</td>
<td>(973)334-7300</td>
<td>3/25/2002</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Supplier W/O number</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>sk0071-02</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Purchase Order</th>
<th>Line Item</th>
<th>Part Number</th>
<th>VIR Qty</th>
<th>Heat #</th>
<th>Serial #</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPN020-113</td>
<td>0001</td>
<td>284382-0002</td>
<td>1</td>
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</table>

<table>
<thead>
<tr>
<th>Reason</th>
<th>Material Status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Complete</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Drawing Reference Number</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Description of the Problem</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FullScreen</td>
</tr>
</tbody>
</table>
SPARS Supports Teaming

Jacqueline McCuiston

Welcome to the SPARS User Home

Teaming Shipyard, NGNN can be granted access/visibility by EB for VIRS when the material is shipping to NGNN.
## Metrics after 1 Year & 6800VIR’s

<table>
<thead>
<tr>
<th>Metric</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Lead Time</td>
<td>90 Days</td>
<td>11 Days</td>
</tr>
<tr>
<td>Admin Log Entries</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Daily Courier runs</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>POLI per VIR</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>VIR Board hours</td>
<td>1 Hour</td>
<td>0</td>
</tr>
<tr>
<td>Mail Delay</td>
<td>Weekly</td>
<td>0</td>
</tr>
<tr>
<td>Reporting</td>
<td>Weekly</td>
<td>On demand</td>
</tr>
<tr>
<td>Audits</td>
<td>Days-weeks</td>
<td>Hours</td>
</tr>
<tr>
<td>Visibility</td>
<td>Limited</td>
<td>Real time</td>
</tr>
</tbody>
</table>
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