



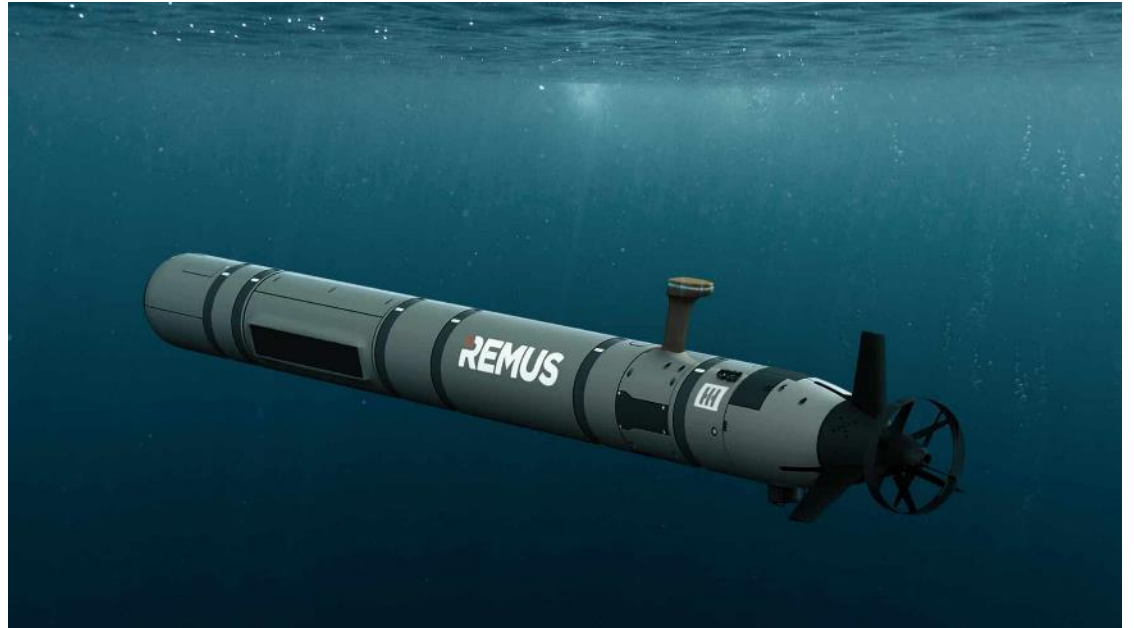
With DFMA®...the Song Remains the Same

2024 International Forum on **DFMA®**
Boothroyd Dewhurst, Inc.

Matthew Miles
Senior Manufacturing Engineer
Unmanned Systems

Agenda

- Returning to the Forum
- Personal Development
- Unmanned Systems
- What is the Same
- DFMA® in the Organizational Structure
- Closing Remarks



Forum Return

- COVID Years
- Supply Chain Disruptions
- Working Remote
- One-way Traffic (office/stores)
- Home Improvements
- Teams Meetings
 - “You’re on mute”
 - “Let’s take that off-line”
 - “You’re not sharing”



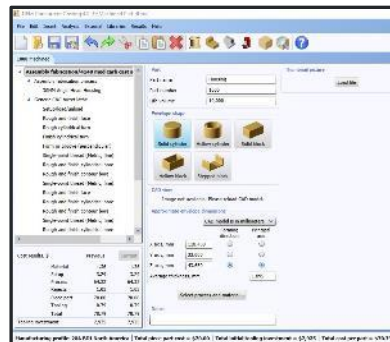
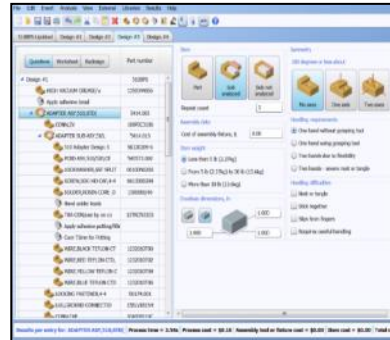
- Supply Chain Recovery
- Hybrid Roles
- 12 Gallup Questions
- Work-Life Balance
- Opportunities to make changes

Personal Development

What do you get from DFMA®?

The Company:

- A powerful engineering tool
- Product simplification with DFA
 - Reduced part count
 - Reduced labor time
 - Reduced total cost
- Part Cost estimation with DFM
 - Materials & Processes
 - Should-Costing Program
 - Benchmarking Tool



The Individual:

- Learn a powerful engineering tool
- Continuous learning
 - Design, Manufacturing, Supply Chain, Materials, Processes, Quality, Lean
 - Communication, Technical Writing
- Subject Matter Expert (SME)
- Facilitating Cross-Functional Teams
- Mentoring
- Opportunities

Become the “Guru”



Personal Development - Products

Product Types with DFMA® Application	Assembly Part Count	Attributes	Operating Temperature
Electric Material Handling Equipment	+3000	Lead acid battery, 24/48V DC	-30° to 43° C
Sensing/Test Instruments for Plastics	+2000	Touchscreen user interface, 120/240V AC	425° C
Industrial Printers	+2000	Touchscreen user interface, 90/240V AC	125° C
Batteries for Grid Energy Storage	+5000	Liquid-metal battery	+500° C
Unmanned Underwater Vehicles	+2000	Lithium-ion battery	-2° to 30° C



Time

- 18 years in DFMA®
- “Getting your affairs in order”
- Retirement (?)
- Bucket List Items



Unmanned Systems

- Huntington Ingalls Industries
 - Newport News Shipbuilding
 - Ingalls Shipbuilding
 - Mission Technologies (MT)
 - Unmanned Systems (UxS)
- MT
 - 7,000+ Employees
 - 100+ Facilities Globally
- UxS
 - Pocasset, MA



Products

- Unmanned Underwater Vehicles (UUVs)
- Remote Environmental Monitoring Units (REMUS)



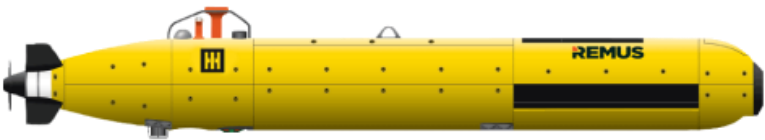
R100M
R130



R300



R620



R6000

Key Features & Specifications

- Model number equates to the ocean depth in meters
- Two-person portable for small-class UUVs
- 10 - 60+ hour mission durations
- Advanced Modularity / Open Architecture
- Multi-Energy Capacities / Chemistries
- Multiple Communications & Antenna options
- Side Scan Sonar
- VIP (Vehicle Interface Program) Software for missioning programming and post-mission analysis
- Cameras and Auxiliary Equipment

REMUS



We're going to need a bigger sub!



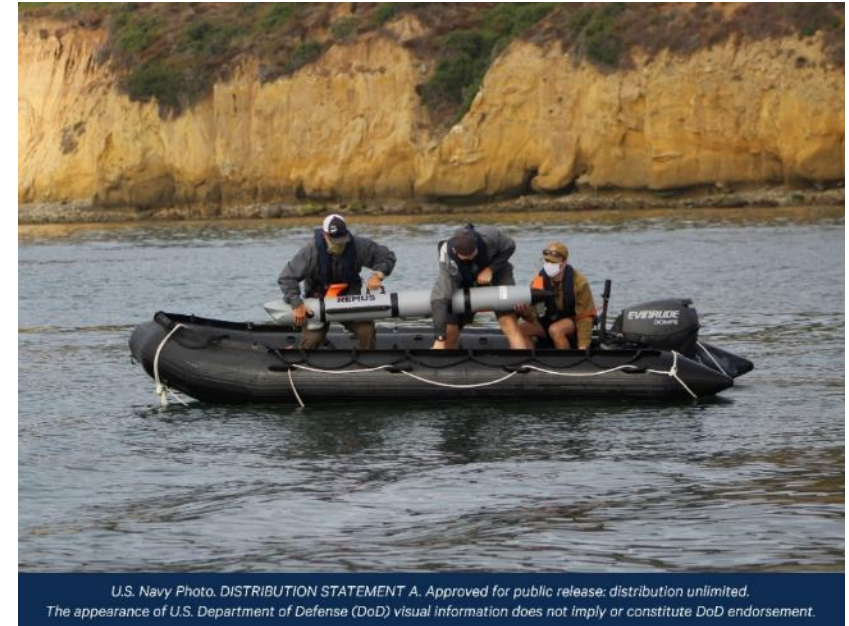
Applications

- Mine Counter Measures (MCM)
- Intelligence, Surveillance, and Reconnaissance
- Search and Recovery Operations (SAR)
- Hydrographic Survey
- Rapid Environmental Assessment



DFMA® at Unmanned Systems

- 2019 Software Purchased
- 2019 – 1 of 3 Key Company Initiatives
 - Establish a DfX Process
 - Charter Developed
 - Data gathering from DFMA® community
 - Integration into “HIIPro5” PD process
 - Initial training with BDI
- 2021 – Continued Training
 - DFMA® Implementation Training with BDI
- Application



What is the Same?

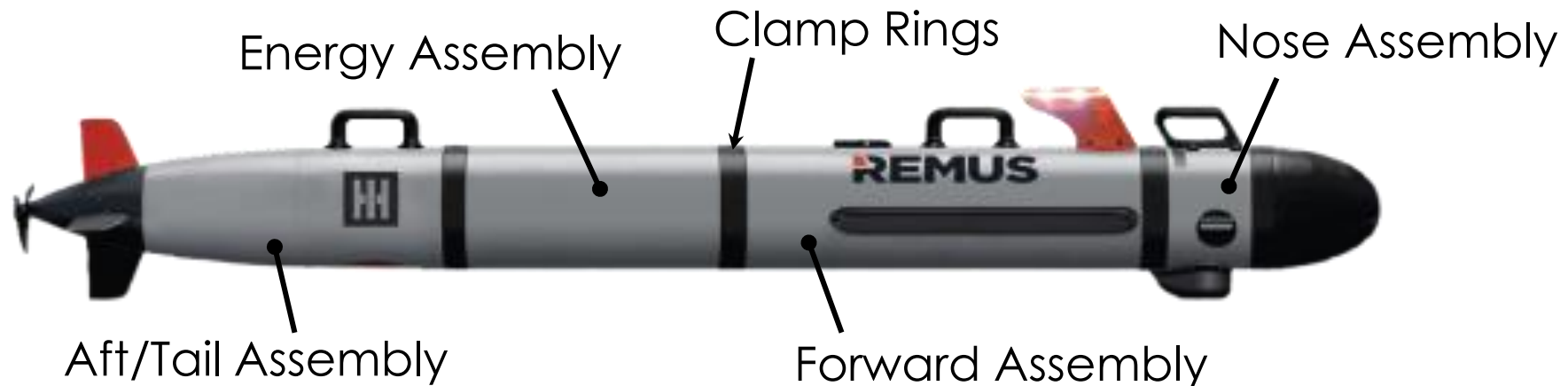
- Executive Support to launch the initiative
- DFMA® Support Structure:
 - Roles & Responsibilities established
 - Process Sheet to guide users
 - Process Workflow established
 - Data/Files Repository
- Trial/Starting Projects
- Continued Application



What is the Same?

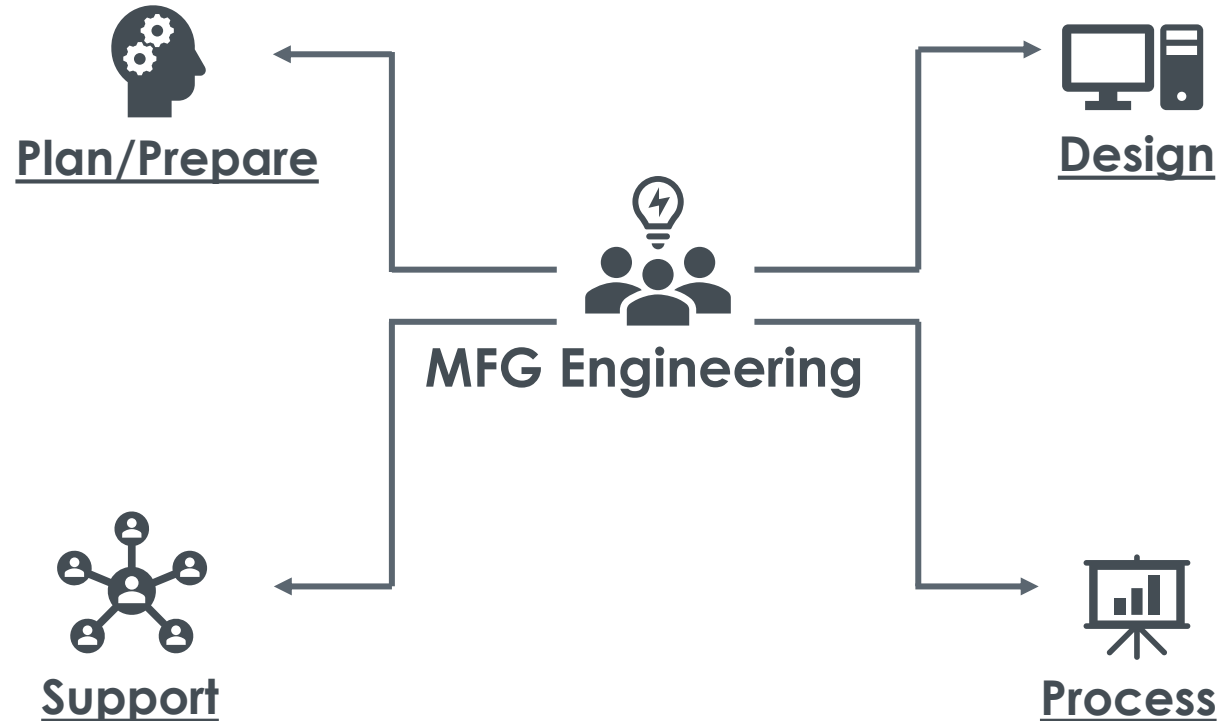
DFA & DFM Analysis Steps:

- Mfg. runs the DFA
 - Data Summarized
 - DFA Index, Part Counts, Assy Time
 - Identify opportunities/ideas
 - Assembler's feedback collected
- List of parts per module for DFM Should-Cost Analysis
 - Forward cost data to Supply Chain
 - Cross-functional team review
 - Generate items to investigate



What is Different?

Primary Responsibilities for Production:



- Proposal Writing
- Project/task Scheduling
- Build Planning
- Purchase Requisitions
- New Equipment Specs
- MSDS Database
- Job Hazard log

- NCRs
- Jira Issue Tracking
- CRMs
- ECN Set-Up
- ECN Review
- Process Document Peer Review
- Onboarding

- **DFMA®**
- DFMEA
- PFMEA
- Fixtures and Jigs
- Work Cell Design
- Bill of Materials (BOM)
- Process/Work Instruction Illustrations

- Manufacturing Readiness Level (MRL)
- Value Stream Mapping
- Time Study
- Six Sigma
- GD&T
- Continuous Improvement
- Inspection



DFMA® in Manufacturing

At UxS, DFMA ties to:

- Design & Process FMEA's
- Production Readiness Reviews (PRR)
- Manufacturing Readiness Level (MRL)
- Technical Data Package (TDP) Engineering-to-Manufacturing

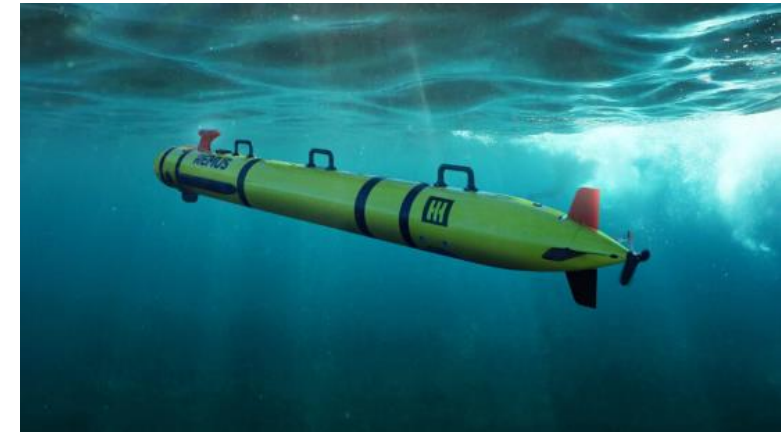
Sustaining:

- Work Instructions
- Routings
- Continuous Improvement



Unmanned Systems – Next Steps

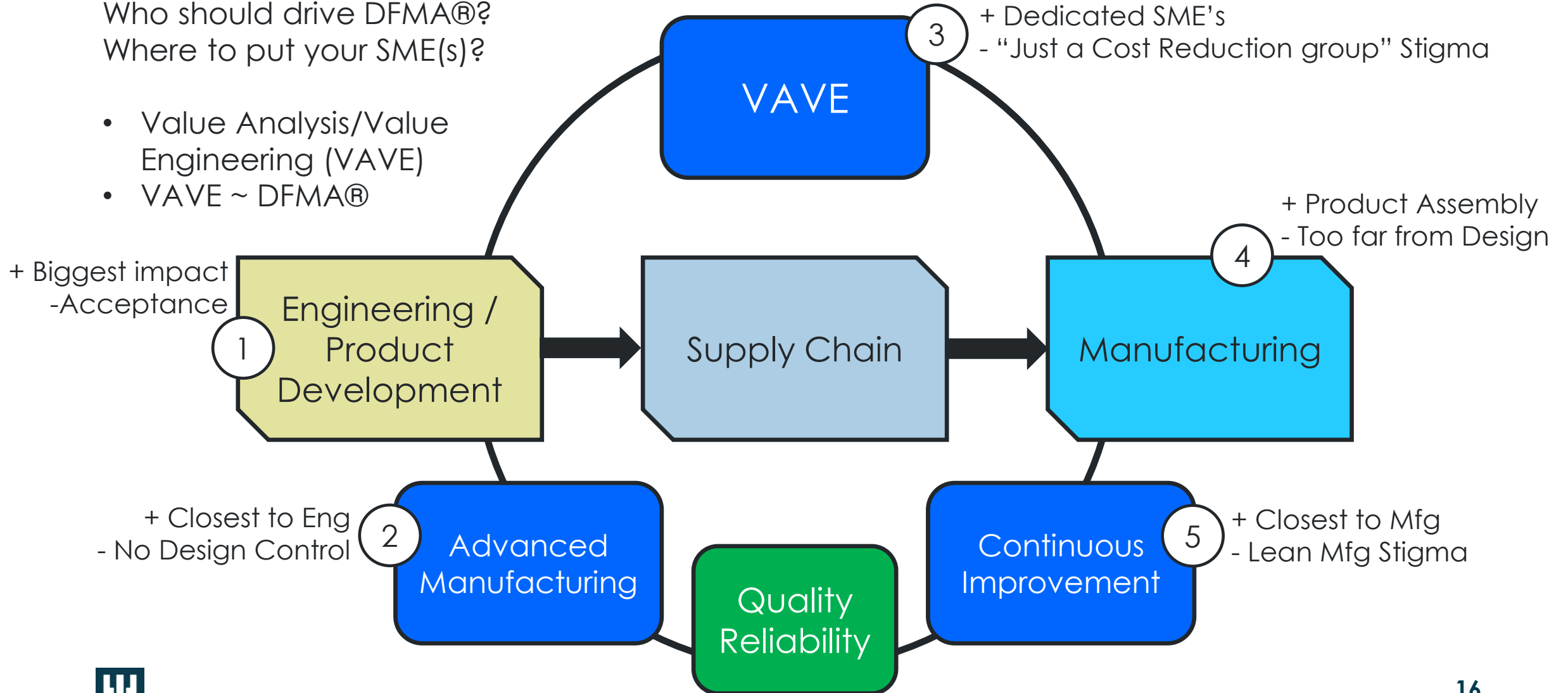
- HIIPro5 process– DFA application for Prod Dev
 - DFMA® Studies on the Product Modules
 - Design Reviews
 - Workshops – Multi-day, Cross-Functional Teams
- DFM Should-Cost Program for Supply Chain
 - Program already started
- Training
 - Develop additional software users (Cross-training in Mfg.)
- Support Mission Technologies Sister-Companies
 - Act as Internal Consultants on DFMA®, already started
- Look for opportunities to expand within HII



DFMA® in the Organizational Structure

Who should drive DFMA®?
Where to put your SME(s)?

- Value Analysis/Value Engineering (VAVE)
- VAVE ~ DFMA®



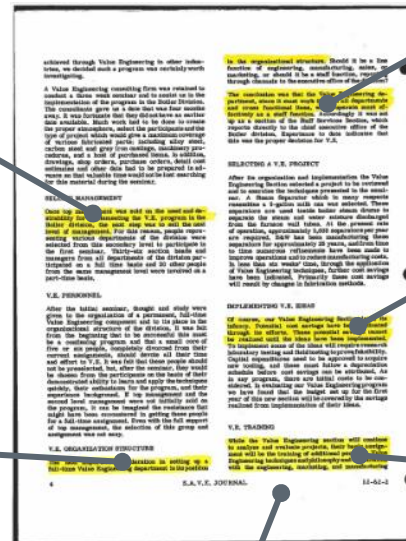
The Song Remains the Same with DFMA®

SELLING MANAGEMENT

Once top management was sold on the need and desirability for implementing the V.E. program in the Boiler division, the next step was to sell the next level of management. For this reason, people representing various departments of the division were

V.E. ORGANIZATION STRUCTURE

The next important consideration in setting up a full-time Value Engineering department is its position in the organizational structure.



S.A. V.E. JOURNAL

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The conclusion was that the Value Engineering department, since it must work through all departments and cross functional lines, would operate most effectively as a staff function. Accordingly it was set

IMPLEMENTING V.E. IDEAS

Of course, our Value Engineering Section is in its infancy. Potential cost savings have been indicated through its efforts. These potential savings cannot be realized until the ideas have been implemented.

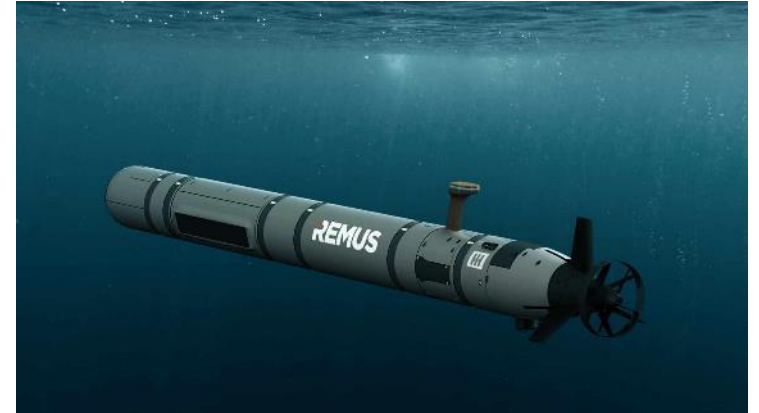
V.E. TRAINING

While the Value Engineering section will continue to analyze and evaluate projects, their basic assignment will be the training of additional people in Value Engineering techniques and philosophy and consultation with the engineering, marketing, and manufacturing



Closing Remarks

- Thank You to BDI for the Forum Return
- Unmanned Systems – Stay the Course
- DFMA®
 - Powerful Engineering Tool
 - Benefits the Company & Individual
- Approach to DFMA® Implementation:
 - Tried-and-True (+600 Forum Papers)
 - Different companies, products, and people
 - The same results - Improvements to product assembly and cost



...the beat goes on!

