







# TRF Bangor Transformation Program



- Who are we
- Our Lean Journey
- USN Innovation History
- Moonshine Rapid Prototyping
- Discrete Event Simulation
- New Capabilities/ Tech Insertion\*
- Tactical Focus Areas\*





# West Coast Strategic Deterrence





# Incremental Maintenance





# Training Within Industry



Part 1, starting page 10:

<https://www.flipsnack.com/kredmond/the-federal-manager-fall-2022.html>

Part 2, starting page 14:

<https://www.flipsnack.com/kredmond/the-federal-manager-winter-2023.html>

Part 3, starting page 11:

<https://www.flipsnack.com/kredmond/the-federal-manager-spring-2023.html>

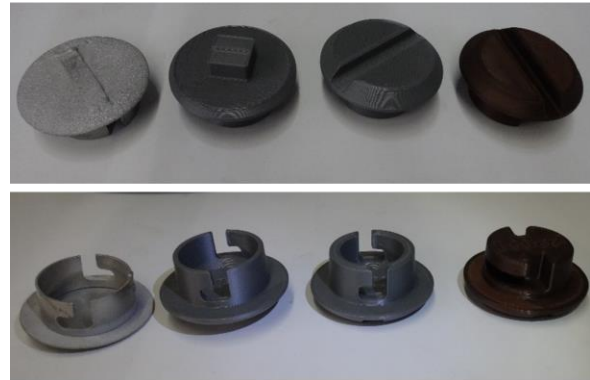


# Moonshine is a “Try *Before* You Buy” capability (aka Try-Storming vs. brainstorming)

Do everything to simulate, test and experiment before committing to any solution.  
The *PHYSICAL* nature of Moonshine creates ideas previously impossible to attain.



Tank access hole cutting



Topside Stanchion FME



Mobile mast repair stand



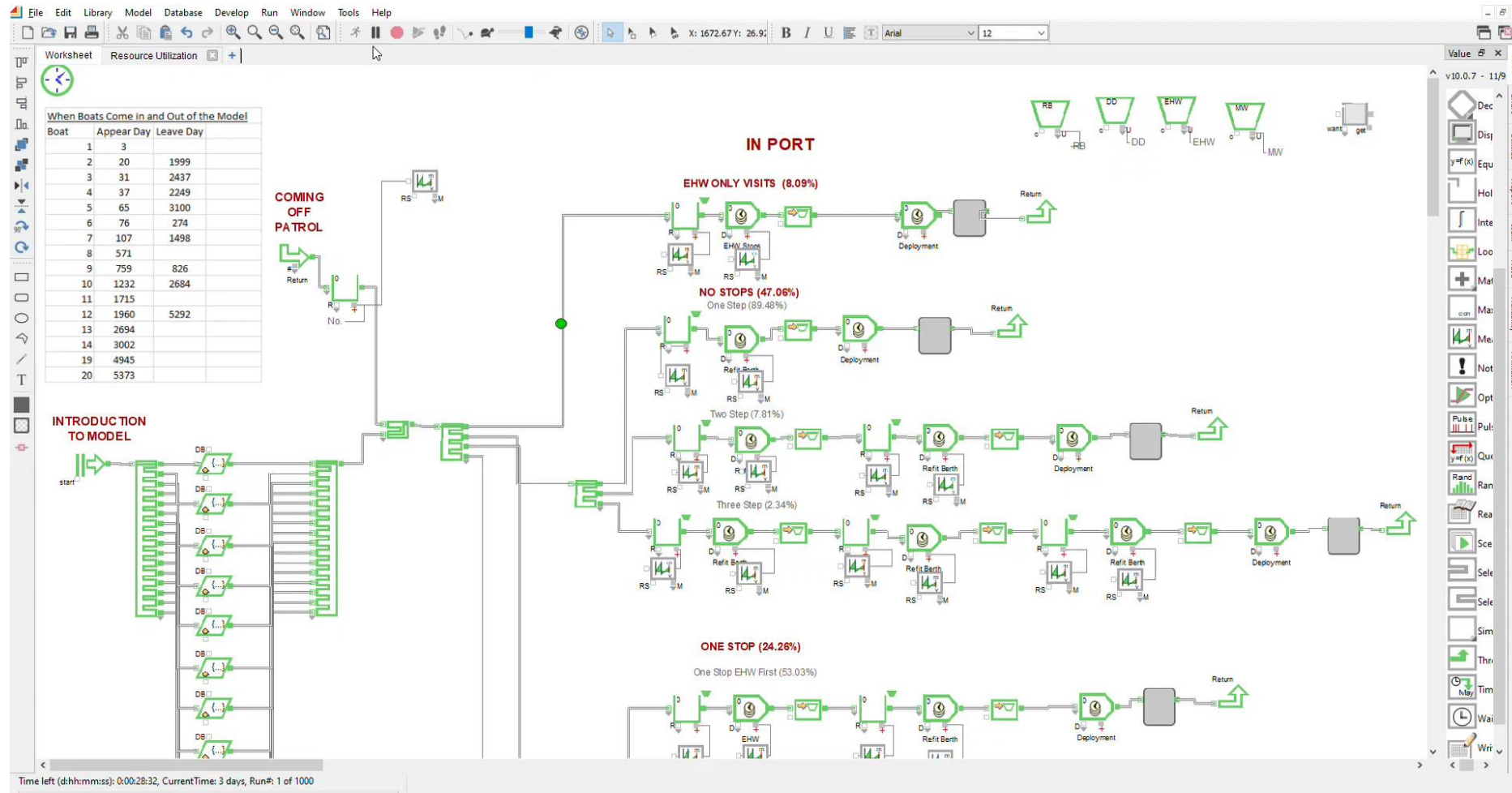
Shipboard tool kit



## LEARN BY DOING!



# Discrete Event Simulation



Study → Build → Test → Refine → Hypothesize

# Status/ Information Flow Constraints



## Worksite

Equipment,  
Temp. Services  
Staging  
Ventilation  
Interference  
S/F Support

## Works Controls

System Conditions  
Tag outs  
Authorization  
Gas Free  
Sail Conditions  
S/F Support

## Documentation

Tech. Guidance  
Approved AWR/CWP  
OQE  
Inspectors  
TMDE  
S/F Support

## Coordination/ Deconfliction

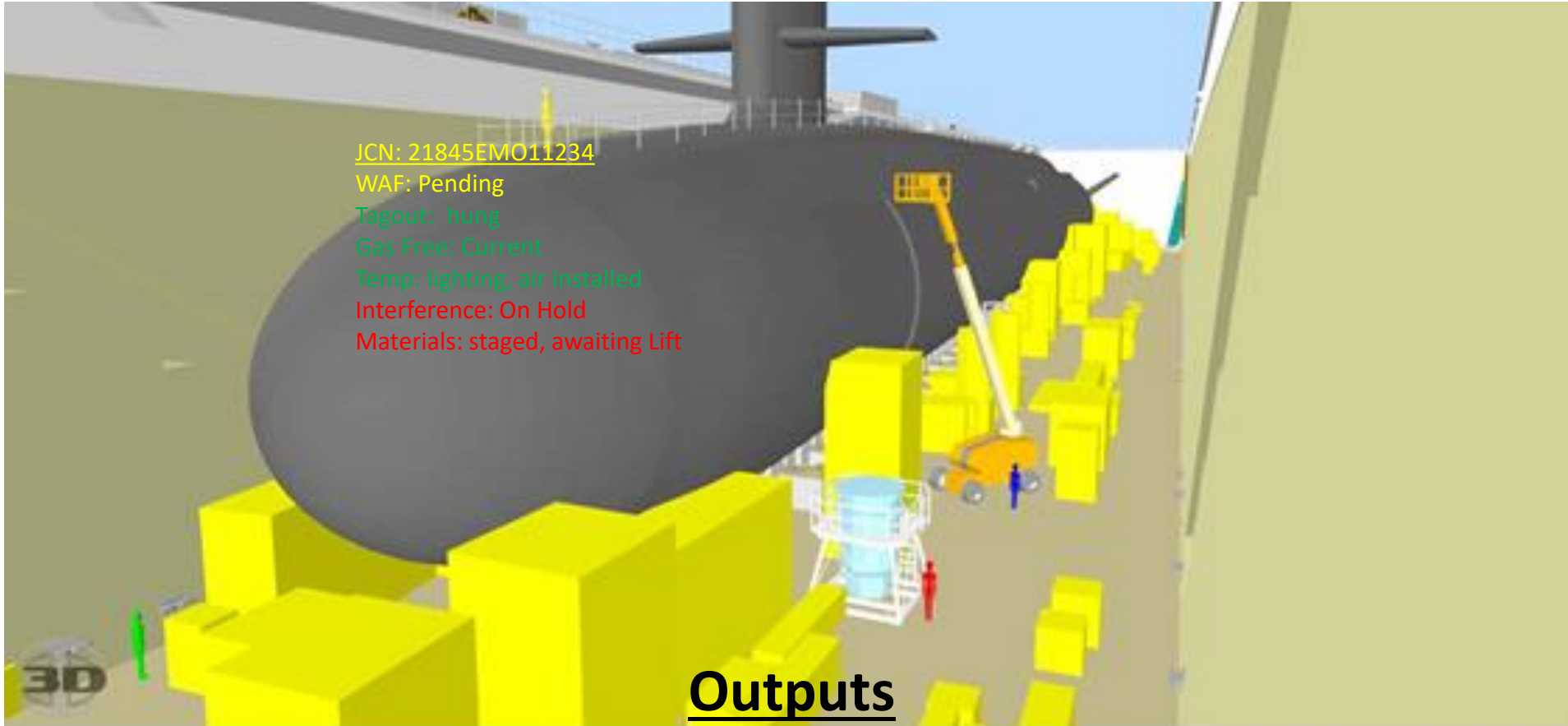
Space  
Skilled Craftspeople  
Inspections  
Lifting and Handling  
Equipment  
Materials  
S/F Support

**Meetings, Paper, Overhead, Multiple Databases  
300+ ManHours / Day at TRFB**

## **Future**

**Automated Tracking, Information Streams, Accessible User Interface**





Real Time: Job Status, Project Management Updates,  
Filter and Automate Notifications,  
High Fidelity Data for Modelling and Risk Management



# Conclusion

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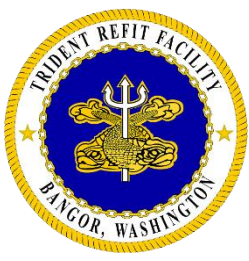
**Automated Tracking, Information Streams, Accessible User Interface**

- Tangible Value within 6 months
- Worksite Visualization for Status and Planning
- Auto Status Updates
- Data Fidelity for Planning and Process Modelling
- Improve 3D Modelling of Infrastructure and Blue Gear
- Drive Culture Change to Prepare for Project Blue Solutions



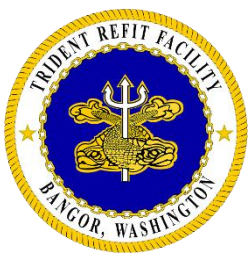


# Conclusion



- Start with Origin stories
- Have a top down and bottom up strategy
- Find your Tims
- Low Tech. first, then new capabilities
- Start building the foundation to leverage AI/ML

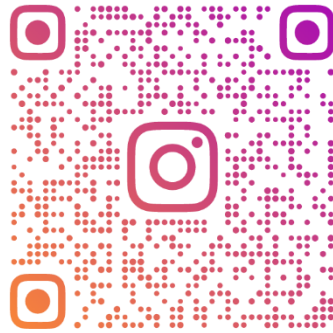




# Questions?

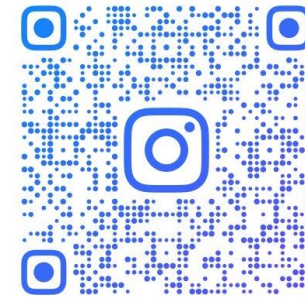


[www.yachtfifer1928.com](http://www.yachtfifer1928.com)



@ZIGGYHASBOATADVENTURES

Instagram



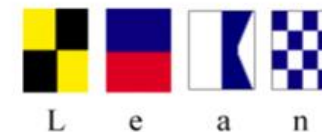
@YACHTFIFER1928

Instagram



# Prework

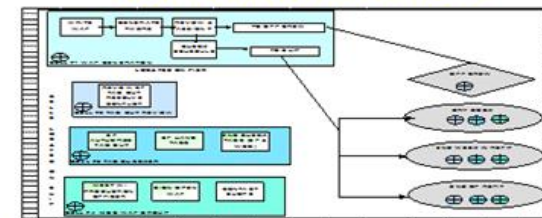
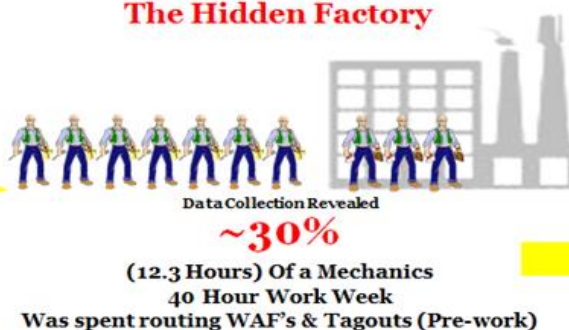
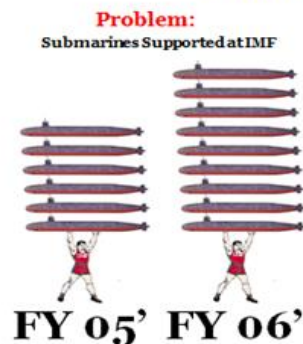
Champions: Lt. Benton, Rick Baker  
Blackbelts: Vince Stamper, Diana Perea



## Command Goals

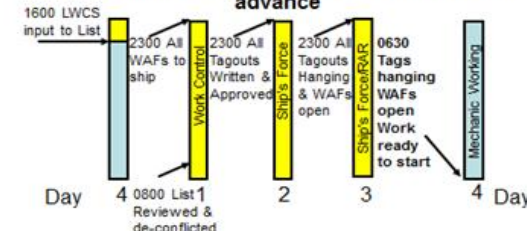
## The Hidden Factory

## New Work Control Cells



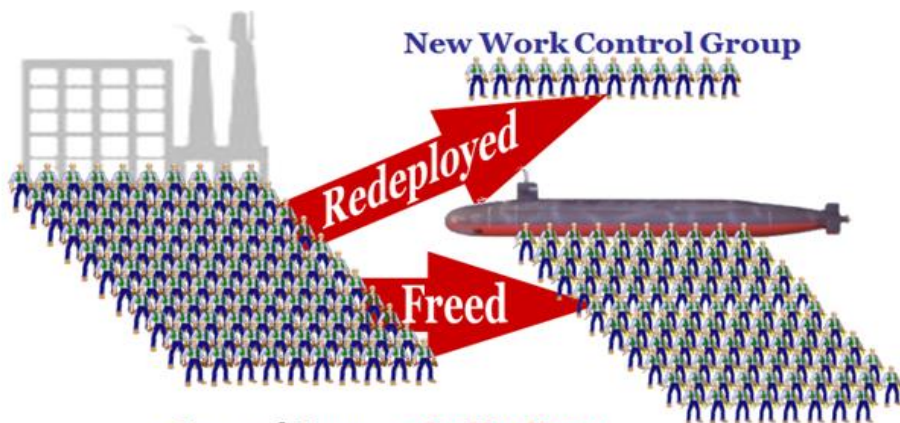
## 4 Day Rolling List

Lead Work Center Supervisors (LWCS) de-conflict and schedule one days worth of work 3 days in advance



•Pre-work Process/ New Work Control Group:  
Design a process which results in the mechanic going to the boat to find the tag-out and WAF complete and work is ready to start

•Work Package Routing: Reduce flow time, wait time, and package handling thus getting the package into the mechanics hands quicker



17 Days to <2 Days  
(Based On Data Collected After Event)

- Pre-work Process: 28.3 Man Years
- New Work Control Group: 59.8 Man Years
- Work Package Routing: 278,000 flow time hours (based on 2,000CWP's & 6,000 FWP's per year)
- ~ 38 Man Years

## Pre-Work Process

### Intermediate Maintenance Facility Bangor

#### Project Description / Expected Outcome:

The Pre-work Process of running Tag-outs, opening WAF's, and routing Work Packages affects approximately 90% of all work performed during any refit period. In the current state, this administrative work is performed by the mechanics. The team goal is to have all pre-work completed prior to the job being issued to the mechanic. This would free the mechanic to do more value added production work.

Value Stream Champions: LT Benton / Rick Baker  
Black Belts: Vince Stamper / Diana Perea

#### Metrics:

Metric	Baseline	Goal	Current	% Change
Pre-Work Increased Work Capacity	5911MDs	7389MDs		125%
New Work Control Group Cell	100MDs per day	40MDs per day		60%
Work Package Routing	15.6MHs	8.75MHs		68%

#### Status:

Pre-Work Process VSA- Jan. 18 - 21, 2005  
Action Item List - Complete

New Work Control Group RIE - Feb. 28 - Mar. 4, 2005  
Action Item List - 92% Complete

Work Package Routing RIE - April 25 - 29, 2005  
Action Item List - 87% Complete

Full Implementation by September 1, 2005

#### Cost to Accomplish:

- Team Costs \$ 76,494.00
- Material/Equipment \$ 0.00
- Total Project Cost \$ 76,494.00

#### Cost Savings:

- Reduction in Cycle Time \$ 8,307,834.00
- First Year Projected Savings: \$ 8,307,834.00

3 Year Projected Savings: \$ 39,194,940.00

Status - As of 08/26/2005



2011	2012-13	2015	2015	2015	2016	2017
						
<small>Distribution Statement A: Approved for public release. Distribution is unlimited</small>	<small>Distribution Statement A: Approved for public release. Distribution is unlimited</small>		<small>Distribution Statement A: Approved for public release. Distribution is unlimited</small>		<small>Distribution Statement A: Approved for public release. Distribution is unlimited</small>	
<b>LM HULC</b> <b>2-days</b>	<b>LM Mantis</b> <b>18-months</b>	<b>LM Fortis</b> <b>Own</b>	<b>BAE OLAD</b> <b>Own</b>	<b>Equipois</b> <b>Own</b>	<b>EksoBionics</b> <b>Own</b>	<b>Suit X</b> <b>Own</b>

**Description:** PSNS&IMF has trial tested seven (7) exoskeleton systems since 2011. This promising human augmentation technology can make holding an industrial tool feel weightless, improving both ergonomics and productivity.

**Problem:** There are no nationally recognized standards or test methods. We collaborated with NIST to develop ASTM F48.

**Solution:** Human Factors and Ergonomics engineers to collaborated to develop standards and test methods, and to funded the set-up of a NIST Exoskeleton test lab to support testing. POC: Ron Zmijewski, PSNS&IMF (360) 340-1226

# Tactical Focus Areas

- **Expand Capability:**
  - Plasma Blast
  - Cold Spray
  - Through Paint Inspection
  - Controlled Industrial Material Marking
- **Discrete Event Simulation:**
  - Waterfront Operations
  - Refit Closeout with plan to expand to the left
- **Command Initiatives:**
  - Onboarding continued
  - Military Time
  - Facilities VSA



# Technology Insertion Milestones

