

Green Developments in **Pollution Prevention and Military Packaging**

presented by:
Trey Kunkel (Speaker), John Bendick, Brian Kettl, and Blair Collins

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE MAY 2011		2. REPORT TYPE		3. DATES COVERED 00-00-2011 to 00-00-2011	
4. TITLE AND SUBTITLE Green Developments in Pollution Prevention and Military Packaging				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Supply Systems Command, 5450 Carlisle Pike, Mechanicsburg, PA, 17055-0791				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES Presented at the NDIA Environment, Energy Security & Sustainability (E2S2) Symposium & Exhibition held 9-12 May 2011 in New Orleans, LA.					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 25	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

- Who We Are and What We Do
- Waste Studies
 - USS Nimitz
 - USS Porter
- Waste Study Initiatives
- Procurement Data
 - Analysis
- Data Initiatives
- Green Packaging
 - Materials
 - Next Steps
- Wrap-Up

Chain of Command



Secretary of
Defense

Secretary of
the Navy

Chief of Naval
Operations



Naval
Air Systems
Command
(NAVAIR)

Space & Naval
Warfare
Systems
Command
(SPAWAR)

Naval Supply
Systems
Command
(NAVSUP)

Strategic
Systems
Programs
(SSP)

Naval
Sea Systems
Command
(NAVSEA)

Naval Inventory
Control Point
(NAVICP)

Asset Protection

(Packaging, Handling, Storage and Transportation (PHS&T))

- Technical Warrant, Navy PMS/PMA Logistics Support, Provisioning, **Packaging Engineering**, Reusable Container Design, Shelf Life, Care of Supplies in Storage (COSIS), Technical Assistance Repairing Processing (TARP), Wood Packaging Material (WPM), Automated Information Technology (AIT)/Radio Frequency Identification (RFID)

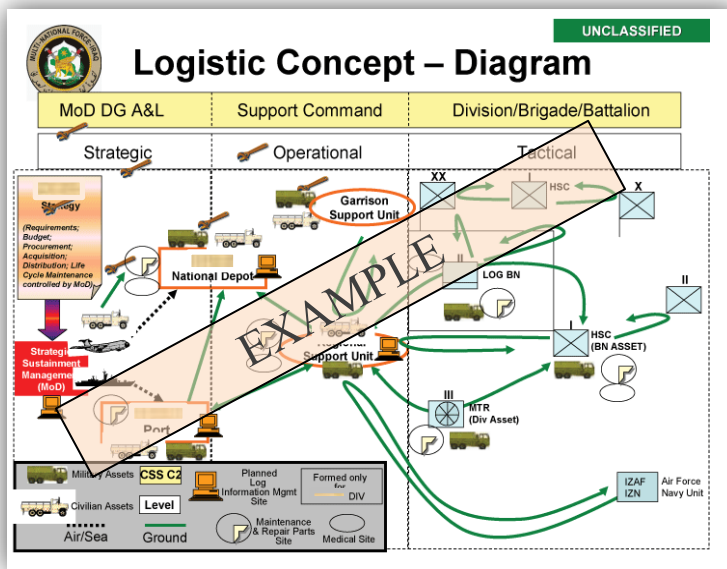
Hazardous Material Control & Management (HMC&M)

- **Afloat:** Ship Hazardous Material List (SHML), SHML Feedback Report (SFR), DLA Hazardous Materials Information Resource System (HMIRS) Updates, Hazardous Material Transportation Waivers,
- **Ashore:** Regional Hazardous Inventory Control System (RHICS), Enterprise Resource Program (ERP) Hazardous Enterprise Data Management Office (HEDMO), DLA HMIRS

Environmental and Pollution Prevention (P2) Programs

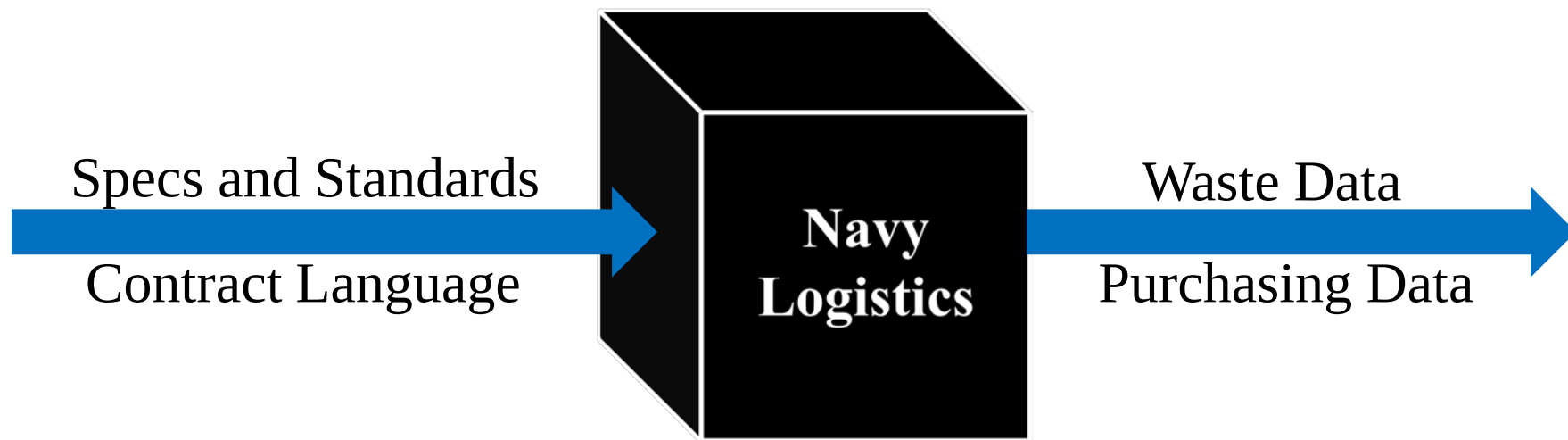
- **NAVSUP Policy Support, Green Procurement, Waste Reduction Afloat Protects the Sea (WRAPS), Plastics Removal in Marine Environment (PRIME)**, Ozone Depleting Substances (ODS), National Emissions Standards for Hazardous Air Pollutants (NESHAP)

- The Navy is not Walmart....
- Our logistics systems are very complicated
 - Many different locations, conditions, timeframes, and products
 - No true closed-loops



This is just the end state. The process to get to this point is 100x larger.

- We can identify what's going in and what's coming out.
- Impact must be made upfront, before entering the "Black Box"
- Decrease Non-Green choices

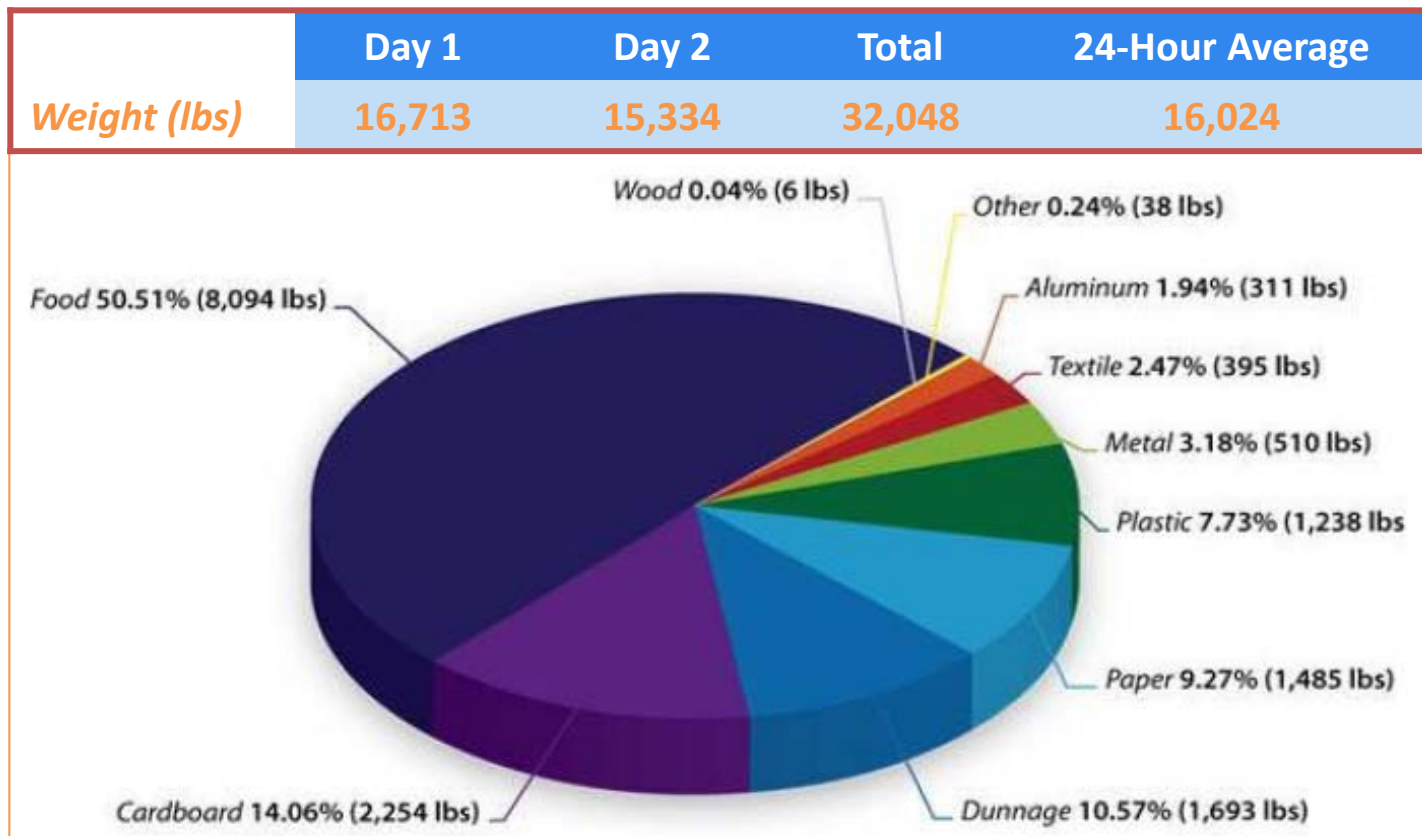


WASTE STUDIES

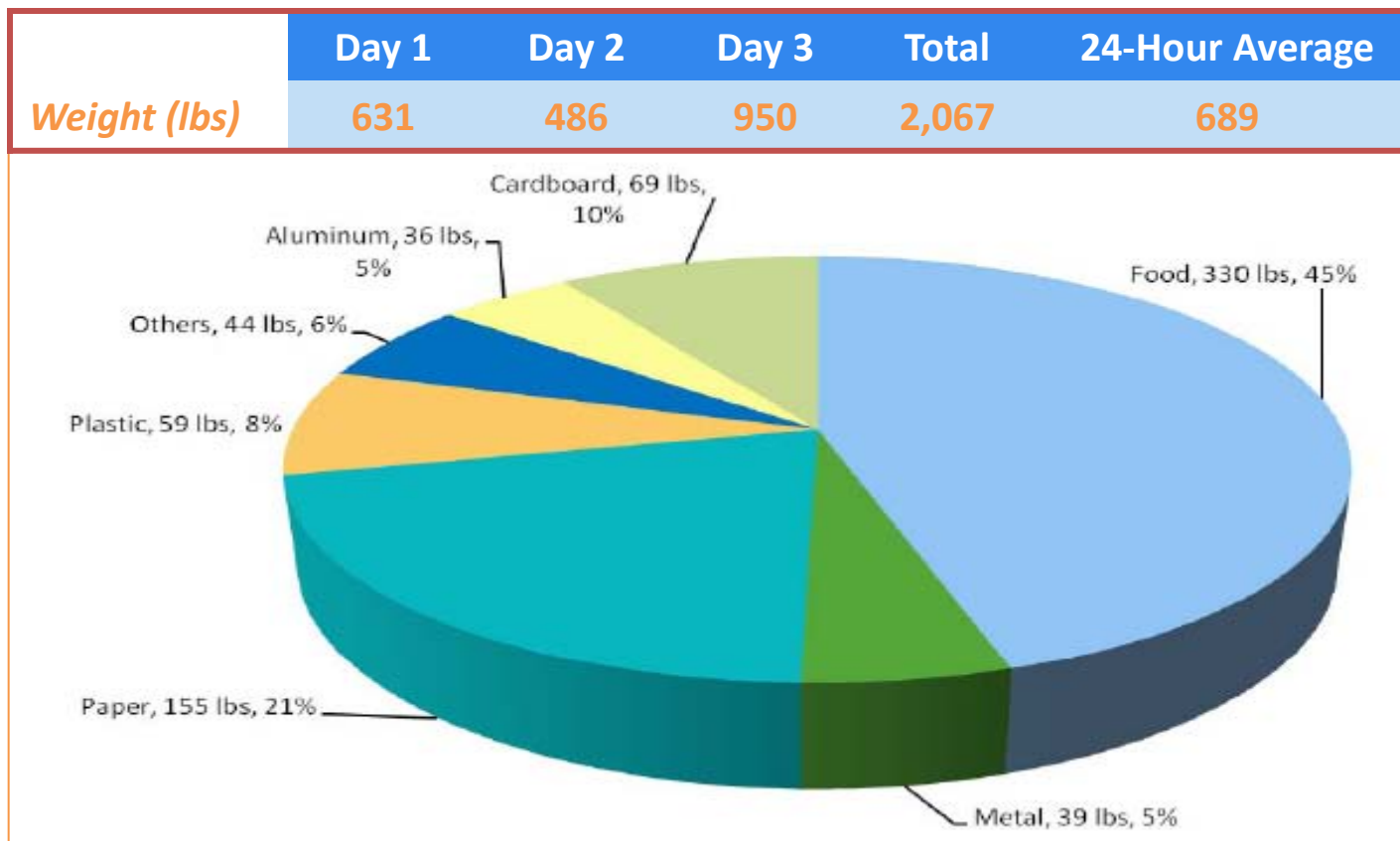
- Waste disposal is a challenge at sea
 - Strict international and domestic laws regarding discharge
- We develop profiles by measuring all waste created over 48-hour timeframes
- This information helps to identify project targets and waste management best practices



- Aircraft carrier with approximately 4,300 onboard crew
- All waste recorded for 48 hours



- Destroyer with approximately 275 onboard crew
- All waste recorded for 72 hours



WASTE STUDY INITIATIVES

Marine Biodegradable Waste Bag

Problem / Goal Statement

Problem: MARPOL Annex V and US Law prohibit plastic disposal at sea. Plastic waste is cumbersome to process and must be stored for off-load to shore.

Goal: Develop a high strength, lightweight, water-proof, marine biodegradable, and non-plastic waste disposal bag to significantly decrease the volume of plastic waste that must be processed and stored aboard.

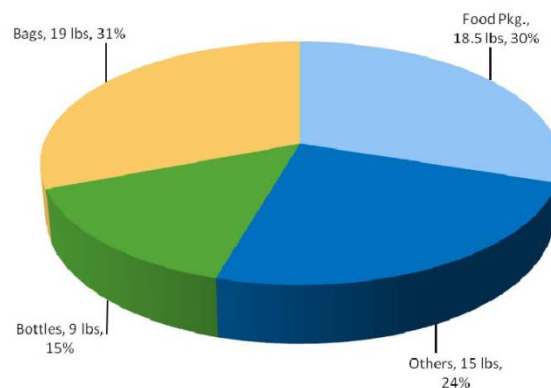
Business Impact

- ◆ Recent waste studies indicate that plastic trash bags can represent up to 30% by weight of the total plastic waste stream.
- ◆ Reducing plastic waste will decrease processing time requirements and free up valuable space normally used to store plastic awaiting offload.

SBIR Phase I

- ◆ Northern Technologies
 - ◆ Soy based paper coating to improve water resistance and maintain biodegradable properties
 - ◆ Successful coated samples developed
 - ◆ Phase II conditional on cost and commercialization estimates.
- ◆ KaZaK
 - ◆ Super hydrophobic nano-altered glass material
 - ◆ Coating capability still at R&D phase, not robust
 - ◆ Not a candidate for Phase II

Shipboard Plastic Waste Content



- Water bottle study
 - Investigated use of reusable water bottles aboard USS Churchill
 - 6-month effort to examine ship's store purchases



Liked and used by 77%
of the crew

20% fewer water bottles
purchased than control

PROCUREMENT DATA

- Numerous suppliers and databases used by the Navy
 - GSA, DLA, Combat Logistics Force Database
- Using all these sources to create order history of frequently purchased items by count and cost

DATA TITLE	SOURCE AGENCY	INFORMATION SUMMARY
HULL	NAVY	High Usage Load List – items that are used in large quantities and are available via Military Sea Lift Command restock during a deployment
Never-Out List	NAVY	List of common use items that always need to be available onboard the ship. Reorder happens before material is exhausted.
CLF Carrier Requisition	NAVY	Comprehensive requisition data from all aircraft carriers (CVN) from the 2008-2009 timeframe
FPDS Navy Data	GSA	Navy Top 300 Global Supply purchases by dollar amount 2010
Navy Orders	DLA	Navy Top 1000 DLA purchases by total dollar amount spent 2010

NSN	Nomenclature	U/I	PRIME Ranking	PRIME	Recycled	Resource Efficient	Bio-Based	Air Quality	Environmentally Preferable	Total	Source
7530-01-335-2623	PAPER, BONDED 8 1/2 X 11	BX	1	Out	In	Out	Out	Out	Out	In	GSA
7220-00-205-0389	DECK COVERING, NON SLIP	EA	IN	In	Out	Out	Out	Out	Out	In	GSA
7920-00-205-1711	RAG, WIPING	BE	IN	In	Out	Out	Out	Out	Out	In	GSA
7920-00-224-8726	MOP, WET (COTTON)	EA	IN	In	Out	Out	Out	Out	Out	In	GSA
8115-00-774-6562	BOX, SHIPPING (TRI-WALL)	EA	1	Out	In	Out	Out	Out	Out	In	GSA
8010-01-344-5322	ENAMEL, INT-EXT, WHITE, 5 GL	CN	2	Out	Out	Out	Out	In	In	In	GSA
8010-01-351-6122	ENAMEL, INT-EXT, WHITE, 5 GL	CN	2	Out	Out	Out	Out	In	In	In	GSA
7920-00-291-5815	BRUSH, WIRE, STEEL	EA	IN	In	Out	Out	Out	Out	Out	In	GSA
7920-00-291-8305	ROOM UPRIGHT	EA	IN	In	Out	Out	Out	Out	Out	In	GSA
8010-00-558-7022	ENAMEL, INT-EXT, WHITE, 5 GL	CN	2	Out	Out	Out	Out	Out	Out	In	GSA
8010-01-344-5100	ENAMEL, SOFT WHT, SEMI GLOSS, 5 GL CN	CN	2	Out	Out	Out	Out	In	In	In	GSA
8415-00-634-2418	ENAMEL, INT-EXT, WHITE, 5 GL	BX	1	Out	In	Out	Out	Out	Out	In	GSA
8010-01-441-6144	ENAMEL, INT-EXT, WHITE, 5 GL	CN	2	Out	Out	Out	Out	In	In	In	GSA
7920-00-926-5176	SPONGE, METAL, 4 X 2 IN	DZ	IN	In	Out	Out	Out	Out	Out	In	GSA
8540-01-055-6094	PAPER, 30 GL	BX	IN	In	Out	Out	Out	Out	Out	In	GSA
8540-01-055-6134	TOWEL, PAPER	BX	IN	In	Out	Out	Out	Out	Out	In	GSA
7350-01-263-6701	PLATES, PAPER	BX	IN	In	Out	Out	Out	Out	Out	In	GSA
8540-01-056-2897	NAPKINS, PAPER	BX	IN	In	Out	Out	Out	Out	Out	In	GSA
8010-01-441-6151	ENAMEL, GRAY, SHIP/BOAT EXTERIOR	CN	2	Out	Out	Out	Out	In	In	In	GSA
7930-01-183-8585	FINISH, FLOOR NONBUFF	CN	1	Out	Out	Out	Out	In	Out	In	GSA
8105-01-284-2924	BAGS, PAPER, 30 GL	BE	IN	In	Out	Out	Out	Out	Out	In	GSA
7930-01-436-7911	ECOLAB NEUTRALIZER (SOFTENING AGENT, LANDRY)	BX	2	Out	Out	Out	Out	In	Out	In	GSA
7930-01-418-1439	ECOLAB OXYBRITE (BLEACH, OXYGENATED, LAUNDRY)	BX	3	Out	Out	Out	Out	In	Out	In	GSA
7930-01-494-0913	ECOLAB CRYSTAL FUSION (RINSE AGENT, DISH WASHING)	BX	2	Out	Out	Out	Out	In	Out	In	GSA
7930-01-494-0068	ECOLAB SILVER FUSION (PRE-SOAK AGENT, DISH WASHING)	BX	2	Out	Out	Out	Out	In	Out	In	GSA
7930-01-494-0067	ECOLAB MAG FUSION (MANUAL DETERGENT, POT & PAN)	BX	2	Out	Out	Out	Out	In	Out	In	GSA

➤ Final product is a list of high usage items with their corresponding environmental characteristics.

➤ This wealth of information can then be parsed into a number of useful tools and lists

DATA INITIATIVES

- **Plastics Removal in Marine Environment (PRIME)**
 - Items are packaged in biodegradable packaging to facilitate waste processing at sea
 - ~850 items already in the program
- By analyzing the data, we have been able to create purchasing recommendations to maximize the use of these items
- Also identified 168 additional items with high chance of success for inclusion in the program



- **Populate With**
 - High Demand Green Items
 - Green Alternatives to High Demand Brown Items
 - Suggestions/Training Aides to Fill in the Gaps
- **Categories** (16-24 Products/Category)
 - Cleaning
 - Galley/Cooking
 - Office
 - Painting
 - Housing
 - Tools
- **Targeted Audience**
 - Purchase Card Holders
 - Contracting Officers



Tomorrow at 1pm, John Bendick will be presenting additional details on how we developed the Green Item Catalog

GREEN PACKAGING

WHY PACKAGING?

- It touches every product
 - Everything then has a sustainable factor
- Several **Sustainable** elements apply
 - Recovered Material 
 - Bio-based products 
 - Environmentally Preferable Products 
- Great target candidates for **Sustainable** materials
 - Plastics
 - Foams
 - Aluminum Foils
 - Kraft Paper
 - Tapes and Adhesives
 - Fiberboard Boxes, etc....



➤ There are several commonly used packaging materials that are excellent candidates for **Greening**

- Polyethylene Sheets: A-A-3174
- Barrier Materials: MIL-PRF-121
- Aluminum Foil: QQ-A-1876
- Kraft Paper: A-A-203
- Chemical Neutral Paper: MIL-DTL-17667
- Tapes and Adhesives: Varies



KEY IDEA IS THAT GREEN ALTERNATIVES DON'T HAVE TO BE MORE EXPENSIVE THAN THEIR COUNTERPARTS!

- Work with material suppliers about delivering **Green Materials**
 - They may already have products that are **Green** but are not covered by the existing contract or NSN
- Begin revision and incorporation of **Green Language** into various material specifications
 - Need to determine what is reasonable to expect and to request
- Work with DLA and GSA to make sure Navy activities can order **Green Packaging** products and materials
 - New designators or identifiers

**GREEN PACKAGING MUST NOT COMPROMISE
PROTECTIVE CAPABILITY**

- Data acquisition is not easy but crucial to ongoing **Green** initiatives
 - Requires joint service effort
 - We have identified what goes in and what comes out of the shipboard environment
- Always on the lookout for more data, success stories, and best practices
- Let us know your thoughts on **Green** initiatives and new technologies that may benefit the Navy

THANK YOU!

Trey Kunkel

john.kunkel@navy.mil, (717) 605-6638

Now go forth and be GREEN.