



Managed and Operated by
Consolidated Nuclear Security, LLC

**Secure & Sustainable Disposition
of Security Sensitive Materials**

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Department of Energy Y-12 National Security Complex

Oak Ridge, TN

- 811 acres
- 343 buildings
- >5,000 employees



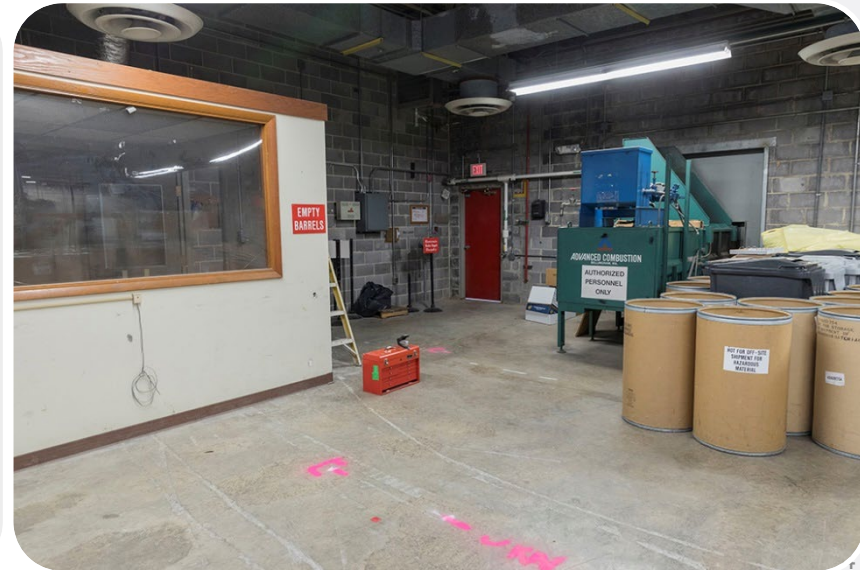
Secure and Sustainable Paper Disposition

- Decision to process all paper on-site at Destruction and Recycle (DAR) Facility
- **Challenges:**
 - Increased volume
 - Condition of existing equipment
 - Impact on Employees
 - Change management: collection, processing and disposition
 - Negative impact to landfill diversion



Functional and Operational Requirements

- Meet security specifications
- Reliably meet expanding demand
- Fit in existing footprint
- Increase efficiency and capabilities (i.e. books, manuals)
- Sustainable disposition options
- Benchmarking activities



Site Paper Usage

- Even though the Site has reduced paper usage by ~52% since 2008, Y-12 still purchased 15.3 million sheets of paper in Fiscal Year 2018
- Reduce paper usage by:
 - Only printing and copying what is needed
 - Duplex print and copy
 - Utilizing electronic methods when possible such as SharePoint, electronic signatures, online review system



Employee Awareness

- Project Communications Partner
- Communications Plan developed
- Plant Services support
- Announcements/Website
- Posters and Meetings
- Earth Day



[Sorting it all out](#)

Upcoming Changes

[Summary of changes](#)

[What's changing?](#)

[What's not changing?](#)

[Why are we changing?](#)

[What are the benefits?](#)

[What is the timeline for implementation?](#)

[FAQs](#)



DAR Modernization Communication Example

SORTING IT ALL OUT

UNDERSTANDING THE NEW Y-12
DESTRUCTION AND RECYCLE (DAR) FACILITY
PAPER RECYCLING PROCESS



WHERE DOES Y-12 OFFICE PAPER GO?

FY 2017

134,000 lb

SENT TO OFF-SITE RECYCLING VENDOR
(BLUE RECYCLE BIN PAPER)

198,000 lb

PROCESSED THROUGH DAR FACILITY
AND SENT TO LANDFILL



FY 2019

300,000 lb

RECYCLED INTO NEW PAPER PRODUCTS



FAST-FOOD BAGS, CUPS, PLATES
AND OTHER SOILED PAPER
PRODUCTS GO IN THE TRASH



DAR FACILITY A LOOK BACK, A LOOK AHEAD

FY 2018 & PRIOR



100% of disintegrated
paper to landfill



Only **sensitive**
paper disintegrated



Old, unreliable paper
disintegrator



Blue recycle bins for
nonsensitive paper that
goes to off-site recycler



100% reused to create
industrial fiber additives



100% of all office paper
to be disintegrated



New paper disintegrator
produces recyclable briquettes



Blue recycle bin paper and all
work-related paper go into
large, rolling carts



Y-12 PAPER FACT

Even though Y-12 has reduced paper usage by 50% since FY 2008, the site still purchased >15.9 million sheets of paper in FY 2017.

5 TIPS TO REDUCE PAPER USAGE

- 1 Think before you print or post: Could this be emailed rather than printed?
- 2 Print only the pages you need from a large document.
- 3 Use digital signatures.
- 4 Print or copy documents double-sided.
- 5 Reduce margin settings to print less paper.



WHERE DO PAPERMAKING MATERIALS COME FROM?

33% WOOD CHIPS &
SCRAPS FROM
SAWMILLS



33% WHOLE TREES &
OTHER PLANTS

33% RECYCLED PAPER

Source: Technical Association of the Pulp and Paper Industry (TAPPI)

HOW MUCH PAPER DO WE USE IN THE U.S.A. EACH YEAR?

69,000,000 TONS OF PAPER &
PAPERBOARD

2 BILLION BOOKS

350 MILLION MAGAZINES

24 BILLION PUBLISHED NEWSPAPERS

Sources: EPA's Advancing Sustainable Materials Management: 2014 Fact Sheet and Technical Association of the Pulp and Paper Industry (TAPPI)



Ensure all paper is properly destroyed!

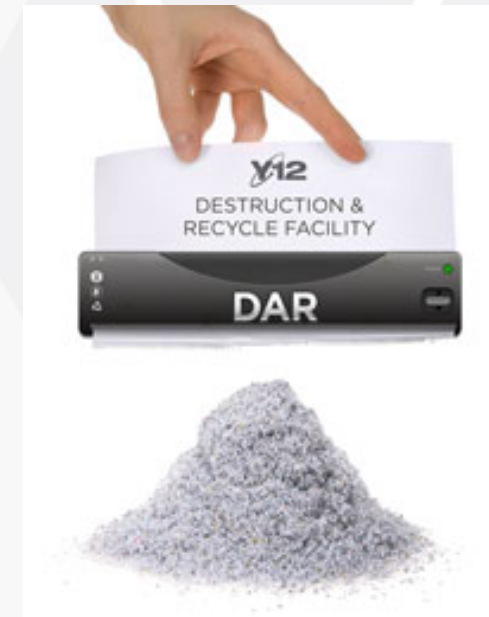
Paper Collection, Processing and Disposition

- **Determined facility collection container needs**
- **Eliminated deskside containers and facility paper dumpsters**
- **Distributed locked carts for collection of all paper**
 - Increased efficiency
 - Reduced anomalies
- **Developed collection schedule**



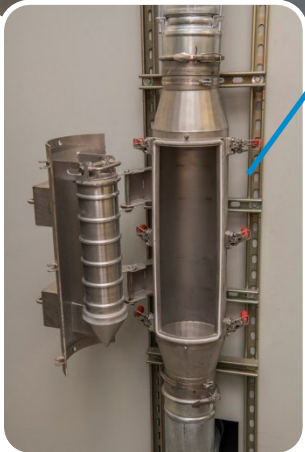
Reuse/Recycle Market Identification

- **Not eligible for traditional paper recycle**
- **Evaluated feasibility of reuse/recycle options for disintegrated paper**
 - Direct to mill – intact paper
 - Disintegrated paper
 - Loose
 - Briquettes
- **Samples**
- **Reuse/Recycle options impact on equipment selection**



New Equipment Selection

- Dual-stage Disintegrator with in-line briquettor



5S for Optimum Facility Layout and Material Flow

5S: Sort, Set in Order, Shine, Standardize & Sustain



Material Packaging and Transportation

- **Increased transportation efficiency with briquettes**
 - ~34,000 lbs. per load
- **Expanded market opportunities**
- **Vendor provides:**
 - Used Gaylord boxes for collection
 - Semi-trailer
 - Transportation to end user
- **Reuse excess pallets**



Paper Disposition

- Disintegrated paper transitioned from a waste to a commodity
- Briquettes reused to make an industrial cellulose fiber additive for construction products such as asphalt sealants, roofing cement, driveway coatings, etc.



Briquettor results in a 90% volume reduction

DAR Modernization Benefits



before



after

- ~300,000 lbs. of paper will be securely diverted from landfill disposal each year
- New LED lighting installed
- Obsolete equipment- reused or recycled
- Improved processing efficiency
- Reduced potential security risks posed by direct off-site recycling

Keys to Success

- Team
- Security and Sustainability are not mutually exclusive
- Employee engagement
- Relationships with recycle vendors





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