

Radio Frequency Identification Transportation System



Recognize the Reality

“When the rate of change inside an institution becomes slower than the rate of change outside, the end is in sight.
The only question is when.”

Jack Welch, former CEO, General Electric

Duplication is not Redundancy

Multiple Waste Management business systems exist across the Enterprise.

They are duplicated across contractors and more than often, do not exchange data elements between systems and/or contractors.

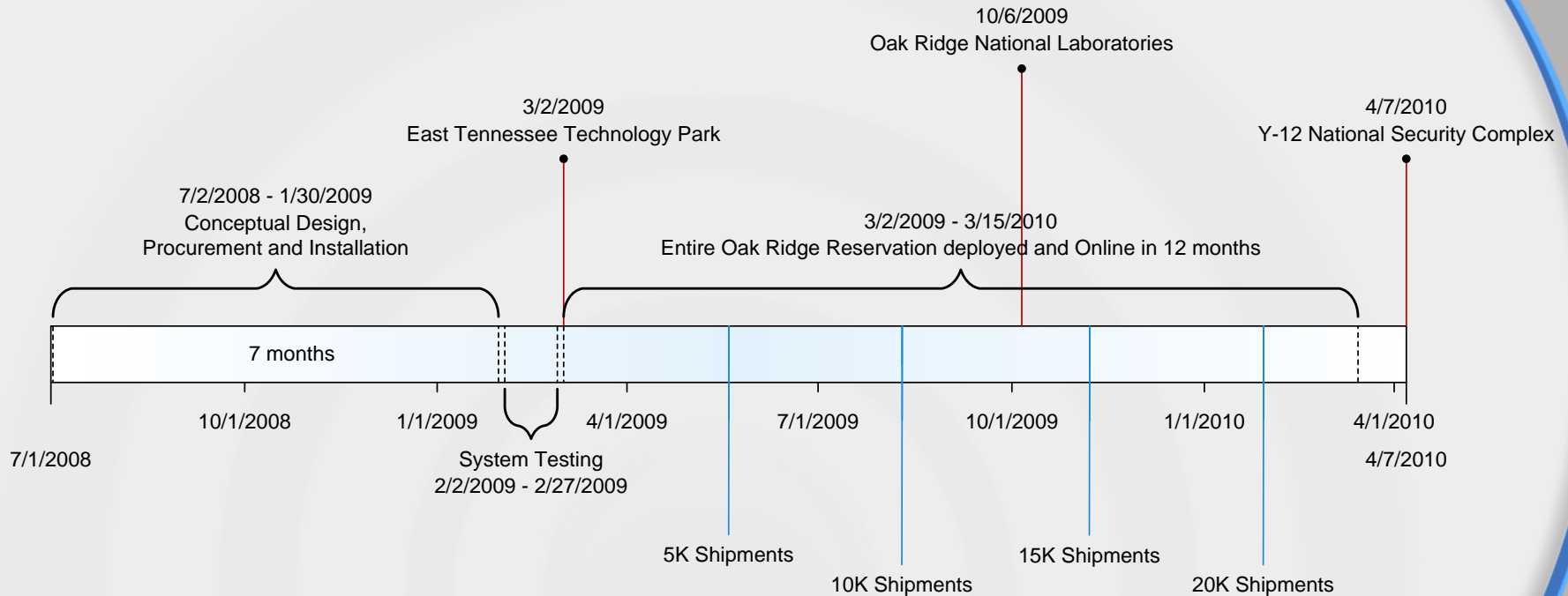
Different sites and contractors employ multiple processes and formulas to base business decisions associated with the handling, packaging storage, transportation and disposal of radiological and hazardous materials.

RFITS Overview

- RFID – Radio Frequency Identification
- Automated Identification Technology (Auto-ID) family
- Industry Standards - EPC Global
- Off the shelf hardware (Alien Technology and Motorola)
- Pharmaceutical, Defense, Logistics, Manufacturing
- Passive RFID Technologies
- Off the shelf software / Government Collaborated
- Innovative use of emerging technology
- Unlike 'traditional' uses of RFID technology
- Blount Island Command Case Study
- Active, Passive, GPS, WiFi, Bar-coding.....



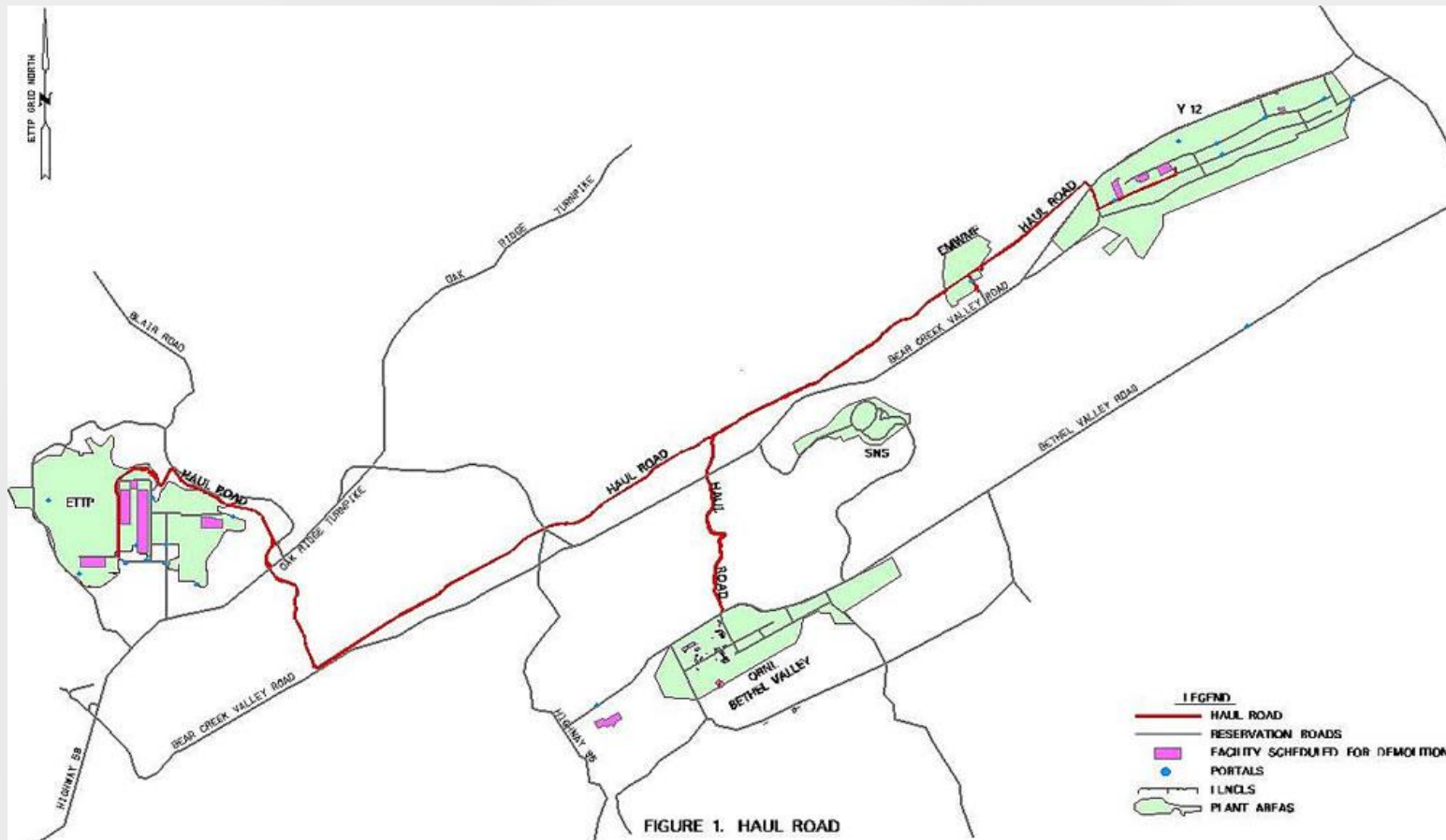
RFITS Timeline



**Teamwork
+ Determination
(Drive) × Passion =
Success**



DOE Enterprise Architecture



Department of Energy Collaboration

RFITS has enabled DOE ORO to establish a complex-wide initiative, supporting on-site electronic shipping and transportation of waste while utilizing industry best practices to develop and maintain a cost effective and sustainable logistics and inventory management system.

As a result, RFITS reduces DOE's carbon footprint through improved operational efficiencies and supports investments in reusable technology while complying with environmental sustainability programs and produces measurable results supporting financial and environmental initiatives.



The Business Case

	BJC (ETTP)	LATA/Sharp (ETTP)	Y12
Cost Avoidance	\$8,700,000	\$572,323	\$528,750
Diesel Use Avoidance	11, 680 gallons	772 gallons	891 gallons
NOx Emissions Avoidance	4522 lbs	299 lbs	276 lbs
CO2 Emissions Avoidance	258,243 lbs	17,067 lbs	15,768 lbs
Sheets of Paper Saved	284,867	23,533	26,960



Award Winning Implementation

2010 FEC Silver Award - The Department of Energy
East Tennessee Technology Park

2011 FEC Gold Award - The Department of Energy
East Tennessee Technology Park

2011 E-Star Best in Class Award – The Department of Energy
Office of Environmental Management



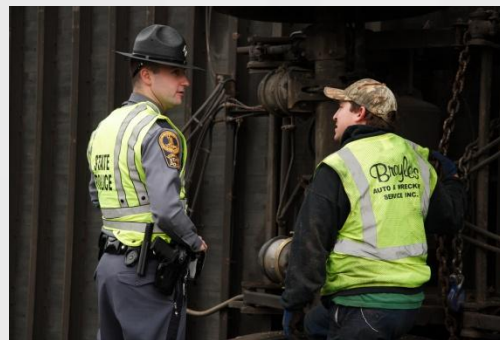
Bill to Reduce Largest Environmental Paperwork Burden Passes Committee

“Replacing the current paper-based waste tracking system with a highly efficient and reliable electronic one would remove a tremendous paperwork burden, assist states in receiving data more quickly, and allow first responders to get data in real-time in the event of contamination”

“this e-manifest system will improve how the federal government tracks the shipment of hazardous waste. It will lessen the paperwork burden on regulated entities, and improve record keeping and federal oversight over hazardous waste transportation, saving \$60 - \$80 million a year”



'Intelligent' Response



TURNKEY
Transportation Services, LLC

The Power of Data



Data Last Refreshed: Monday, June 14, 2010 at 15:52:49 Current View: Generic Dashboard

Select Trucks Select Subproject Select Waste Lot Clear Filter Clear Alerts Add Note to

ETTP Routes EMMWF Dashboard

Show: ☒ Loading Station ☒ Outbound CLA ☒ Outbound ETTP Scale ☒ Outbound EMMWF ☒ Inbound ETTP Scale ☒ Inbound CLA

Truck ID	Subproject	Waste Lot	Alert	Loading Station	Outbound CLA	Out ETTP
10801056	ETTP Zone-1 RA	4.12		Jun 14 14:43:44	1080-1056-100614-14	6
10801028 H28	ETTP Zone-1 RA	4	ERG: 163	Jun 14 14:44:11	1080-12-100614-14	6
10801050 H50	ETTP Zone-1 RA	4	Proper Shipping Desc: UN2915, Radioactive material, Type A package, 7, fissile excepted, solid/oxide (Cs-137, Co-60, K-40, Tc-99, Th-232, U-234, U-235, U-238) Total Activity 3.23E-04 TBq	Jun 14 14:40:10	1080-13-100614-14	6
10800010	K-25 Building D&D	6.999		Jun 14 14:36:25	1080-10-100614-14	6
10800012	K-25 Building D&D	6.999		Jun 14 14:35:26	1080-1045-100614-14	6
10800013	K-25 Building D&D	6.999		Jun 14 14:39:29	1080-32-100614-14	6
10801045 HT145	K-25 Building D&D	6.999		Jun 14 14:32:38	1080-4-100614-14	6
10800032	K-25 Building D&D	6.999		Jun 14 14:38:27	1080-20-100614-14	6
10800004	K-25 Building D&D	6.999		Jun 14 14:31:55	1080-1054-100614-14	6
10800020	K-25 Building D&D	6.999		Jun 14 14:26:08	1080-27-100614-14	6
10801054 HT154	K-25 Building D&D	6.999		Jun 14 14:31:55		6
10800027	K-25 Building D&D	6.999				6

SmartTrack!

EMMWF Vehicle Tracking

Currently Showing: 2010-06-16
Data For:

ETTP Shipments Completed 2010-06-16

Shipment Number	Last Seen	Transit Time	Trip Count	EMMWF Time	Time Reten Trips
1080-1003-100616-08	9:55 AM	67 min.	1	23 min.	Not Applicable
1080-1014-100616-08	9:55 AM	69 min.	1	21 min.	Not Applicable
1080-1028-100616-08	10:01 AM	69 min.	1	26 min.	Not Applicable
1080-1055-100616-08	10:07 AM	64 min.	1	19 min.	Not Applicable
1080-1050-100616-08	9:56 AM	79 min.	1	21 min.	Not Applicable
1080-1046-100616-08	9:55 AM	81 min.	1	20 min.	Not Applicable
1080-1044-100616-12	1:56 PM	59 min.	3	15 min.	111 min.
1147-4-100616-07	10:12 AM	113 min.	1	75 min.	Not Applicable
1080-1039-100616-08	10:02 AM	70 min.	1	26 min.	Not Applicable
1080-12-100616-12	2:05 PM	69 min.	2	17 min.	165 min.
1080-25-100616-13	2:19 PM	69 min.	3	26 min.	103 min.
1080-26-100616-10	11:57 AM	60 min.	2	20 min.	63 min.
1080-29-100616-13	2:15 PM	55 min.	3	16 min.	118 min.
1080-10-100616-12	1:58 PM	58 min.	2	17 min.	166 min.
1080-16-100616-12	1:57 PM	62 min.	2	21 min.	132 min.
1080-18-100616-10	11:59 AM	52 min.	2	18 min.	52 min.
1147-4-100616-07	11:54 AM	61 min.	9	18 min.	41 min.

Map: Map Satellite Hybrid

EMMWF OUT: 7
EMMWF IN: 17

ETTP IN: 61
ETTP OUT: 0

ORNL OUT: 0
ORNL IN: 0

Shipment Overview

Shipment Number: 1080-1003-100616-08

Last Updated: 6/16/10 9:55 AM

Subproject: ETTP Zone-1 RA

Vehicle: Dump Truck

Type: Vehicle

ERG Number: 163 - Radioactive Materials (Low to High)

Shipment Contents

Waste Lot: 4.12

Gross Weight: 60340.00

Tare Weight: 29080

Net Weight: 31260.00

Disposition: Unavailable

Special Handling: ERG Number 163 - Radioactive Materials (Low to High)

Complete Details For Shipment

Shipment Time Line

Loading Time: 6/16/10 8:27 AM

Outbound Scale: 6/16/10 8:48 AM

Inbound EMMWF: 6/16/10 9:10 AM

Outbound EMMWF: 6/16/10 9:34 AM

Making Data Useful

Radio Frequency Identification Transport System (RFITS) - Dashboard - Windows Internet Explorer

http://fts.bechteljacobs.org/DashboardGeneral/Default.aspx

Radio Frequency Identification Transport System RFITS

Data Last Refreshed: Thursday, January 28, 2010 at 15:28:23 Current View: Generic Dashboard Records Returned: 50 Shipments - Today: 125 Total: 30,512 (Log Out)

Select Trucks Select Subproject Select Waste Lot Clear Filter Clear Alerts Add Note to Old Shipment Show All Rows View Fixed Header Dashboard All Routes EMMWF Dash

Show: ☒ Loading Station ☒ Tag Integrity Check ☒ Outbound CLA ☒ Outbound Scale ☒ Inbound EMMWF ☒ Cell Operation ☒ Outbound EMMWF ☒ Inbound Scale ☒ Inbound CLA ☒ Inbound to Loading Station ☒ Inbound Truck Yard ☒ Outbound Truck

Truck ID	Subproject	Waste Lot	Alert	Loading Station	Tag Integrity Check	Outbound CLA	Outbound ETTP Scale	Outbound ORNL Scale	Inbound EMMWF Scale	Inbound EMMWF	Cell Operation	Outbound EMMWF	Outbound EMMWF Scale	Inbound ORNL Scale
10801044	K-25 Building	6.999		Jan 28 14:46:55		Jan 28 14:48:29	65560		Jan 28 15:08:06	Jan 28 15:18:05	Jan 28 15:27:57			
10801044	HT144			1080-1044-100128-14		14:51:48	39160		Jan 28 15:07:13	Jan 28 15:26:41				
1080101	K-25 Building	6.999		Jan 28 14:44:46		Jan 28 14:46:17	64280		Jan 28 15:06:55	Jan 28 15:13:19	Jan 28 15:24:43			
10801048	K-25 Building	6.999		Jan 28 14:42:10		Jan 28 14:44:11	44440		Jan 28 14:35:02	Jan 28 15:03:03	Jan 28 15:17:36			
10801009	ETTP Zone-1	4.12		Jan 28 13:55:40		1080-1009-100128-13	43820		Jan 28 14:29:19	Jan 28 15:01:29	Jan 28 15:15:41			
10800032	K-25 Building	6.999		Jan 28 14:07:33		1080-32-100128-14	43980		Jan 28 14:31:27	Jan 28 14:59:03	Jan 28 15:11:20			
10801046	ETTP Zone-1	4.12		Jan 28 13:47:25		1080-1046-100128-13	62540		Jan 28 14:18:37	Jan 28 14:55:02	Jan 28 15:09:45			
10800013	K-25 Building	6.999		Jan 28 13:55:11		1080-13-100128-13	68320		Jan 28 14:14:42	Jan 28 14:53:56	Jan 28 15:07:12			
10800102	K-25 Building	6.999		Jan 28 13:50:07		1080-102-100128-13	44580		Jan 28 14:13:07	Jan 28 15:08:30	Jan 28 15:19:42			
10801051	ETTP Zone-1	4.12		Jan 28 13:41:20		1080-1051-100128-13	58560		Jan 28 14:12:34	Jan 28 14:51:29	Jan 28 15:01:18			
10801047	K-25 Building	6.999		Jan 28 13:46:45		1080-1047-100128-13	45260		Jan 28 14:09:55	Jan 28 14:40:32	Jan 28 15:22:02			
10801002	ETTP Zone-1	4.12		Jan 28 13:24:50		1080-1002-100128-13	42200		Jan 28 14:14:16	Jan 28 14:52:54	Jan 28 15:05:32			
10801028	K-25 Building	6.999		Jan 28 13:45:07		1080-1028-100128-13	64180		Jan 28 14:09:35	Jan 28 14:38:32	Jan 28 14:50:56			
10801054	K-25 Building	6.999		Jan 28 13:44:12		1080-1054-100128-13	45720		Jan 28 14:04:57	Jan 28 14:36:43	Jan 28 14:49:39			
10800007	K-25 Building	6.19		Jan 28 13:43:09		1080-7-100128-13	45320		Jan 28 14:11:06	Jan 28 14:43:52				
10801030	ETTP Zone-1	4.12		Jan 28 13:29:36		1080-1030-100128-13	46600		Jan 28 14:03:28	Jan 28 14:35:38	Jan 28 14:45:25			
10800028	K-25 Building	6.19		Jan 28 13:41:59		1080-28-100128-13	39860		Jan 28 14:03:18	Jan 28 14:30:45	Jan 28 14:42:13			
10800012	K-25 Building	6.19		Jan 28 13:40:34		1080-12-100128-13								

50080
ACM
Overweight
Apr 28
13:50:33

41940
Apr 28
14:26:35

42980
Apr 28
14:19:25

37260

ACM Overweight: Net=22120

Transportation Infrastructure Integration and New Technology Development



Creating “Smart” Shipping Documents



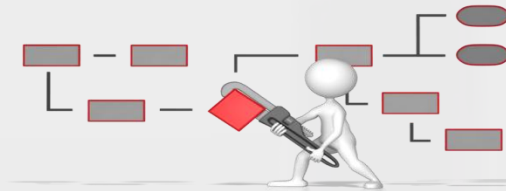
BILL OF LADING SHIPPER Oak Publishing 1111 NW Columbia Dr Gresham, OR 97030 Shelly Lowry, 512-546-0430, P: 512-546-0450				BOI, NO: DME5161984 Carrier: Midwest Motor Express Pickup Date: 11-17-1988 Origin Terminal DEST NO: P: 512-914-1214 P: 511-95-1522 Destination Terminal 11/18/88 P: 402-591-4571 P: 402-593-4141 22 Broker: (714)	
COMMENTS Superior Printing 1111 Weaver Dr Omaha, NE 68102 Bob Nelson, 402-441-4122, F:					
SHED PARTY BILL TO: Bill Fegand/Thad Ewary to Curves LMC 1111 Weaver Dr Omaha, WA 95353					
Special Instructions:				Freight Recd: Recd: _____ Collected _____ 3rd Party _____	
Accessorial:					
Qty	Type	Weight (M)	WGT	Item Description	U/L
2	PAKAGE	1150	31570	MACHINES OF SWEDISH/DA	
2	1150	GRAND TOTAL:			
When the value is reported in pounds, use imperial units specifying in writing the system or incident area (the pounds in Kilob). The agent is cleared of all liability for damage to the goods in transit.					
Commodity: _____		Incoterms: _____		Rate: _____	
Remit DDD to: _____		Customer check acceptable: _____		DD Amount: _____	
Note: Liability limitations for loss or damage to this shipment may be applicable. See 48 USC 5612(a)(1)(A) and (B).					
Insured subject to following:		Trailer: _____		Weight: _____	
Covered subject to following:		Covered subject to following:		The carrier shall not make delivery of this shipment without payment of all other bills due to carrier.	
1. Fire, theft, and damage to the goods in transit.		1. By Shipper _____		1. By Shipper _____	
2. Fire, theft, and damage to the goods in transit.		2. By Other _____		2. By Other _____	
Shipper Signature/Date		Carrier Signature/Date		Carrier Signature/Date	
I hereby declare upon inspection that the goods are as described, and that the goods are in conformity with the description appearing in the applicable regulations of the BIL.		I hereby declare upon inspection that the goods are as described, and that the goods are in conformity with the description appearing in the applicable regulations of the BIL.		I hereby declare upon inspection that the goods are as described, and that the goods are in conformity with the description appearing in the applicable regulations of the BIL.	
Shipper: _____		Carrier: _____		Carrier: _____	

Strategic Uncertainties

- Currently there has been no “right” strategy to clearly define how we move forward
- Pressure to use proprietary, corporate and or licensed business systems
- Growing need for unencumbered access to data
- Access to resources and information in a timely manner
- Competitive uncertainties – is it intellectual property or will it “raise the tides” – “wasn’t developed here” mentality
- Risks – funded-to-fail, can you still deliver?
- Mobility in the workforce – moving to the edge
- “Smart” Vendor products

Streamlining Efficiencies

- Identify “Best Practices” - quickly
- Look at commercial best practices as it relates to technology
- Talk to leaders in other industries
- Look for policy or procedure best practices from the field
- Change internally before external conditions result in change
- Look at internal business systems that are not connected
- How much re-work exists in your supply chain
- Share physical and cyber security solutions/lessons learned
- Use other sites as resources for technical solutions
- Look for areas for automation and elimination of paper



Enterprise Architecture

Consolidating these systems and their associated infrastructure allows a flexible spending model to eliminate program delays and over-runs.

Consolidated and commoditized IT spending facilitates the ability to move more rapidly to adopt strategic sourcing solutions.

DOE can effectively coordinate or consolidate the procurement of IT-related goods and services while aggregating demand for waste operations commodities.

DOE can effectively negotiate for volume discounts and improved service levels for goods and services at the site level.



Big Data and Business Intelligence

- Allowing Federal Agencies unencumbered access to key data elements will be critical to success.
- Integrated operations will reduce the overall cost of collecting data.
- The fixed costs of monitoring performance and predicting supply and demand as well as the collection of business intelligence can be distributed across the enterprise.
- We don't share lessons learned with each other often enough, our business systems are – at times - inefficient and ineffective.
- We should be able to instantly identify the most cost effective solution defined by historical data and performance metrics.



Contractor to Contractor Collaboration

The ability to reduce DOE's baseline budget by consolidating systems allows the reduction of operational costs by combining key business systems into a centralized enterprise application following the methodology that as contractors change, the tools they use to manage DOE's assets do not.



Supply Chain Management



Integration of electronic manifesting creates a unique tracking number which is associated with multiple carriers as it traverses through the supply chain.

Human Capital Sustainability

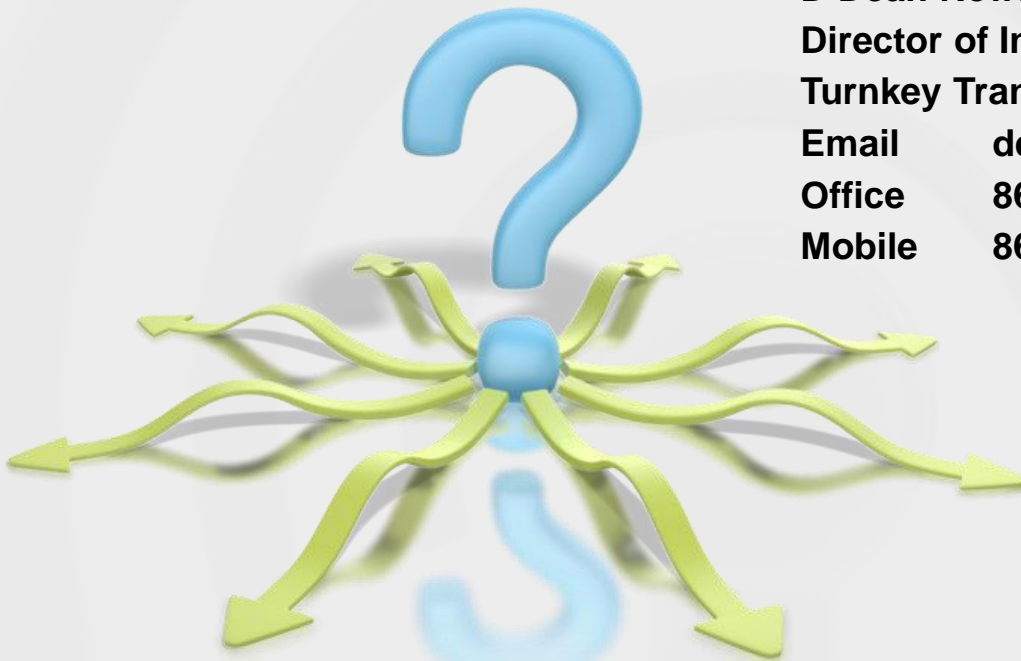
Subproject	Shipments
K-25 Building D&D	19377
ETTP Zone-1 RA	6905
ETTP RA Soils	6865
K-33 Building Demo	5528
Clean-Fill Generators	5411
Y-12 Salvage Yard	1534
Bldg 9211	1005
Legacy Removal 9201-5	661
Main Plant Area Facilities D&D	656
Poplar Creek -1	282
Bldg 9769	207
2000 Complex West	179
Bldg 3026 C&D Wooden Superstructure	168
ORNL Small Facilities Complex	124
K-27 Pre-Demolition (ARRA Funded)	122
Poplar Creek -3	110
General Maintenance Facilities	69
ETTP Other Defense Facilities S&M	20
Balance of Site D&D - Utilities Group	20
K-27 Area D&D	12
2000 Complex East	8
SE Contam Lab Complex	7
Poplar Creek Facilities D&D	4



In Summary

- Eliminate creation of physical shipping documents
- Centralized viewing of all shipments
- Efficiencies through Time-in-Motion data
- Increased awareness in physical security
- Increased visibility and access to data
- Increased performance
- Increased accountability
- Reduce bottlenecks
- Reduce errors

Questions?



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