

RFID Journal Live! 2006

May 1-3, 2006
MGM Grand Conference Center
Las Vegas, Nevada



Putting RFID to Work

May 3, 2006



Case Study: Using Auto ID Technologies to Facilitate "Track and Trace" at Dow Chemical

J. Craig Casto

The Dow Chemical Company

RFID • GPS • Auto ID • Technology Center



Putting RFID to Work

May 3, 2006



Perspective



- RFID/GPS and associated sensor technology has the potential to significantly improve the way our industry does business
- In order to meet the needs of the future, we need to rethink fundamental supply chain processes and strategies – challenging the status quo, benchmarking and leveraging to achieve our goals:
 - Low cost to serve
 - Defect-free service
 - Safe, secure and sustainable supply chains
- RFID/GPS and associated sensor technology will play an important role in enabling many of these changes – it has the potential to dramatically change the way people and IT systems interact across the entire supply chain

Background



- **Company:**
 - \$46 billion in annual sales
 - 42,000 employees
 - Broad range of products to customers in more than 175 countries
- **Supply chain:**
 - Two million product shipments each year (~60% in N. America):

	<u>Shipments</u>	<u>Volume</u>	<u>High Profile Cargo Ton-Miles</u>
Truck	85%	43%	9%
Rail	9%	29%	90%
Bulk marine	1%	26%	1%
Other	5%	2%	--

- We are the largest bulk chemical shipper in N. America, both by rail & truck
- About 20% of our product shipments involve international border crossings
- Carriers handling Dow products average 2 hazardous material accidental release incidents per every million shipments -- our ultimate goal is zero

Approach



- More than a decade of experience using RFID technology
- An integrated RFID / GPS strategy to guide our efforts moving forward:
 - Built on our RFID experience and ongoing pilots
 - Implemented through a multi-generational plan that addresses near-term and longer-term opportunities
 - Delivering value to Dow and our customers and helping us meet increasing security requirements
- We view RFID and GPS as additional tools in our Auto ID toolbox that will enable our deployment of “Most Effective Technology” solutions for our Supply Chain and Manufacturing work processes

Opportunities



- Maintenance
- Asset Management
- Manufacturing Process Optimization
- Product Inventory & Warehouse Management
- Container & Product Tracking
- Logistics & Transportation Optimization





RFID Experience and Current Pilots



Putting RFID to Work

May 3, 2006



Access Control



Application:

- Dow employee and contractor badges
- Security access control to Dow facilities
- Monitoring of limited exposure areas

Value:

- Automated gate entry
- Automated monitoring
- Improved safety and security
- Deemed export control compliance



Product Use



Application:

- Dow AgroScience in-ground termite traps
- Utilizes RFID tag to allow exterminator to monitor traps with RFID reader
- RFID tag becomes active when termites eat conductive paper sandwiched between wood
- If tag is active, bait tube is inserted



Value:

- Productivity - exterminator can monitor more homes in a day with this approach
- Environmental benefits

Consumer Products



Application:

- Preparing to meet customer requirement to label all cartons / pallets of Great Stuff® Foam with RFID enabled labels

Value:

- Condition of doing business
- Potential to leverage technology to gain work process improvements in production, inventory and warehouse management



Field Collection of Data

Application:

- Utilizes existing railroad RFID tags
- Implemented at two sites and scheduled for four additional sites
- Utilizes a hand held scanner to capture data from railroad RFID tag and through bar code scanning of site logistics menu board



Value:

- Automated field data collection
- Automated transactional reporting to internal systems

Monitoring Remote Employees



Application:

- Emergency monitoring of pipeline employees over 4000 miles of Gulf Coast pipeline
- Mapping employee location
- Emergency contact
- Vertical indicator

Value:

- Emergency response
- Workforce deployment



Cylinder/Small Container Tracking



Application:

- Global tracking at individual cylinder level
- Technology agnostic solution; capable of handling bar codes, RFID and GPS
- Supply chain network includes manufacturing locations, contract warehouses and distributors



Value:

- Product stewardship and security
- Asset utilization

Intermodal Container Tracking



Application:

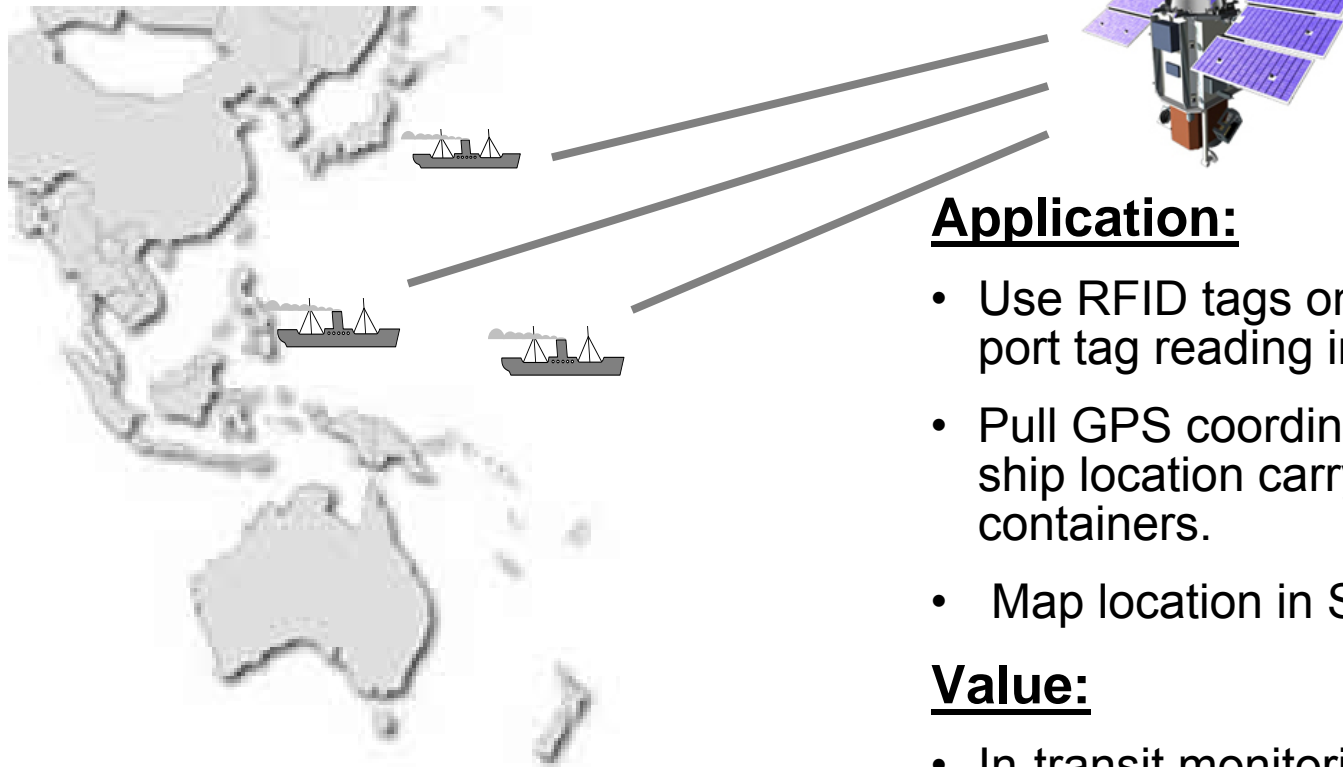
- RFID / GPS tracking of Intermodal containers

Value:

- Inventory visibility of in-transit product
- Secure trade lanes
- Container level security monitoring
- Greater visibility
- Customs clearance



Enhanced Intermodal Container Tracking



Application:

- Use RFID tags on containers with Savi port tag reading infrastructure
- Pull GPS coordinates from carriers on ship location carrying Dow Intermodal containers.
- Map location in Savi ASP

Value:

- In-transit monitoring of floating inventory
- Flexibility in diverting in-transit inventory to meet customer needs
- Improvement in knowing what's where

Enhanced Railcar Tracking



Application:

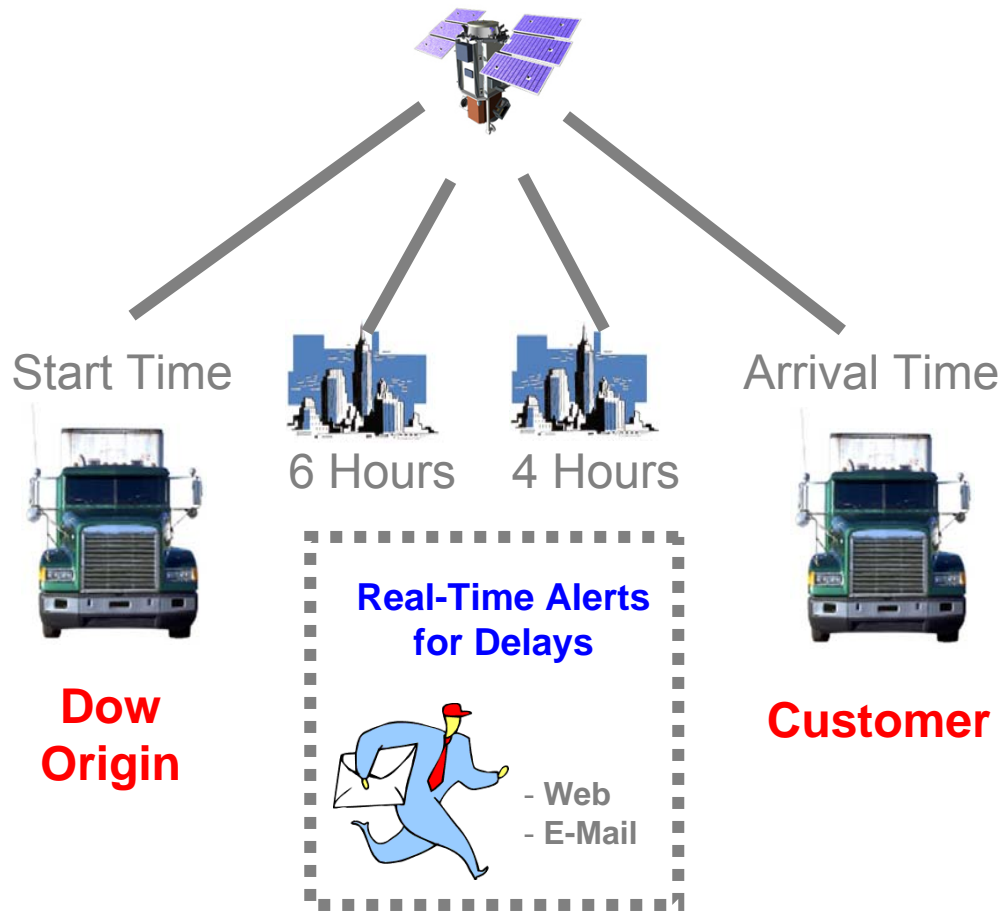
- Tracking of hazardous products moving in rail equipment
- On demand location monitoring with GPS tracking
- Route monitoring
- Environmental conditions monitoring
- Security monitoring



Value:

- Product stewardship and security
- Railcar fleet management

Tank Truck Tracking



Application:

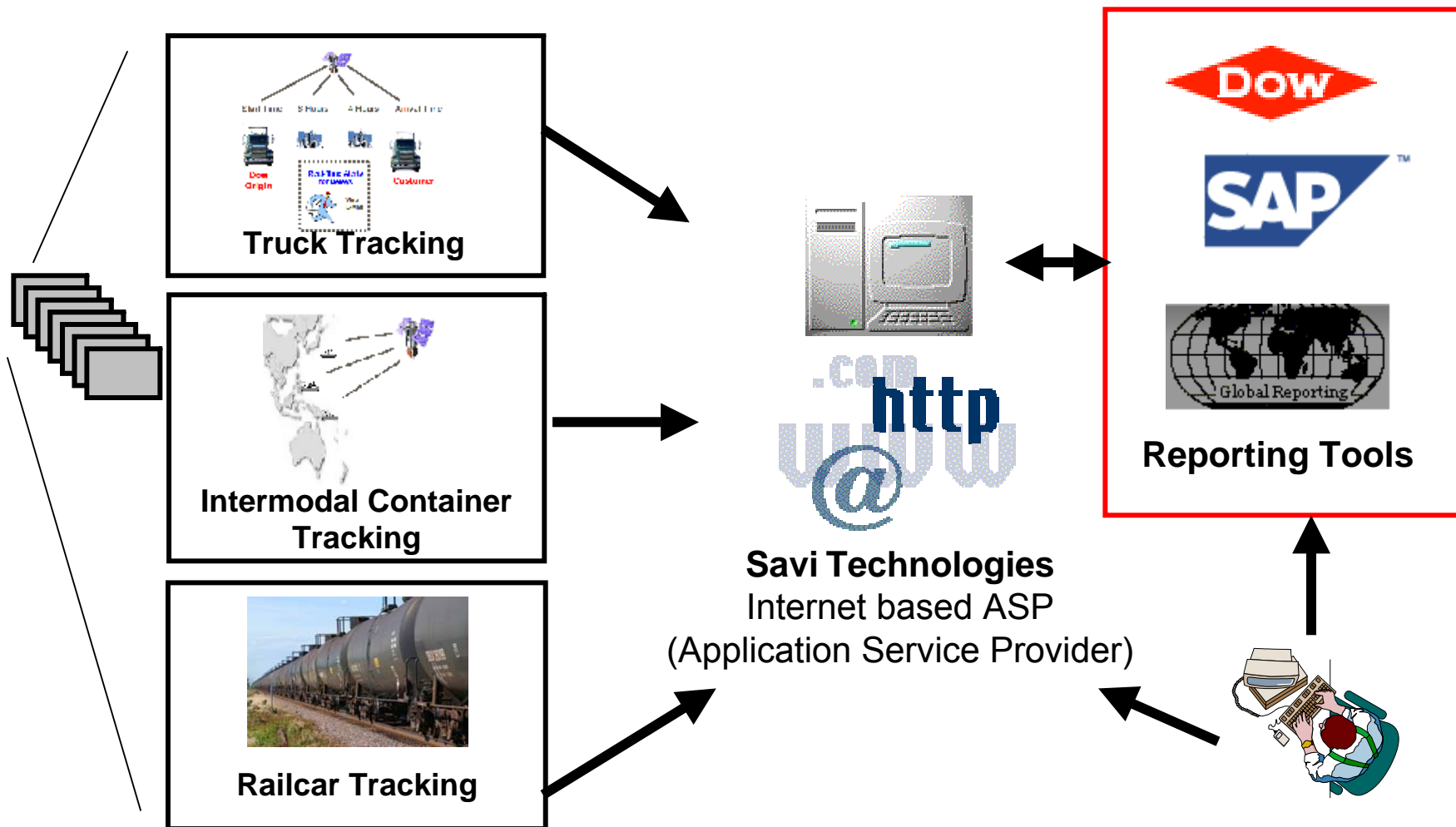


- Use existing GPS data from carriers and Geofence origin and destination coordinates
- Monitor in-transit times to predict delays en route
- Monitor actual arrival time when GPS coordinates hit customer Geofence
- Monitor departure from customer

Value:

- Product stewardship and security
- Provide accurate product delivery information

“Track and Trace” at 50,000 Feet





Summary of Benefits

- Improved labor efficiencies
- Improved data quality
- Improved supply chain visibility:
 - Real-time tactical decision making
 - Identification of trends, process inefficiencies and problems
 - Highly responsive supply chain processes
- Improved supply chain reliability:
 - Increased speed to market
 - Reduced inventories
 - Improved customer service
 - Lower demurrage costs
- Improved safety and security
- Improved compliance