Transportation Logistics

Rob Williams

Air Traffic Management Logistics Manager

ITT Corporation

Overview

- Transportation fulfillment – 2 perspectives
- Communications – the critical link

Transportation Logistics

- 2 perspectives
  - Nextel building out national cell phone network of 24,000 sites
  - ITT building out national network of 800 sites
- Similar as both use same class of equipment
  - Heavy but "people handled"
  - Sensitive so air ride truck
  - Expensive
  - No hazmat other than batteries
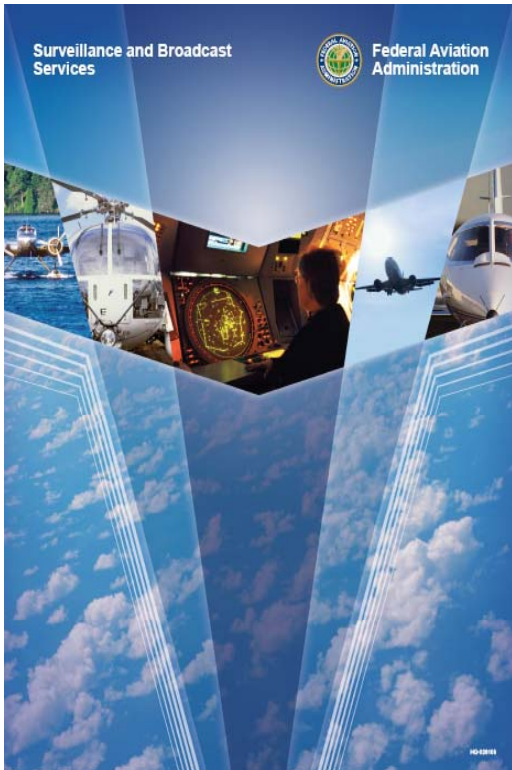
Transportation Fulfillment

- What matters: Reliable, reasonably priced, arrive undamaged, and arrive on time
- What shippers are willing to give – can tolerate "some" inconvenience as long as it's known up front but watch expenses
- Need pre-call since we sometimes have to fly someone in to meet shipment
- Both ship freight (new sites and modifications) and small packages (repair parts)

Nextel Transportation Fulfillment

- Nextel shipped everywhere from rural sites to dense urban areas
  - Some rural sites very challenging due to terrain and equipment being moved
  - City sites even more challenging as locations were usually least desirable – basements or rooftops
- Shipped 10x22 concrete shelters, towers, radio racks, reels of cable, and pallets of site materials

ITT Transportation Fulfillment

- Shipped everywhere but mostly rural sites and airports
  - Rural sites very challenging due to terrain and equipment being moved
  - Airports are sometimes challenging due to aircraft co-existence restrictions
- Ship telecom style cabinets, generators, radio racks, and pallets of site materials
  - Contractor brings all manner of hardware, cable and towers

ADS-B Automatic Dependent Surveillance Broadcast   TIS-B Traffic Information Services Broadcast   FIS-B Flight Information Services Broadcast

Surveillance and Broadcast Services

Traffic Information Service - Broadcast (TIS-B)
TIS-B broadcasts surveillance data to equipment in the aircraft and provides ADS-B equipped aircraft with position reports from secondary surveillance sources for non-ADS-B equipped aircraft.

Flight Information Service - Broadcast (FIS-B)
FIS-B Transmits graphical National Weather Service products, Temporary Flight Restrictions (TFRs) and special use airspace information.

Automatic Dependent Surveillance - Broadcast (ADS-B)

Automatic - Periodically transmits information with no pilot or operator input required

Surveillance - A method of determining position of aircraft, vehicles, or other asset

Dependent - Position and velocity vector are derived from the Global Positioning System (GPS) or a Flight Management System (FMS)

Broadcast - Transmitted information available to anyone with the appropriate receiving equipment

The ADS-B system is a crucial component of the Next Generation Air Transportation System (NGATS). It provides surveillance and situational awareness simultaneously to pilots and air traffic control facilities. ADS-B is designed to improve the safety, capacity and efficiency of the National Airspace System while providing a flexible expandable platform to accommodate future air traffic growth. ADS-B provides improved situational awareness with the following information in the cockpit:

- Heading
- Altitude
- Speed
- Aircraft category
- Call sign
- Distance

FIS-B display

TIS-B display

ADS-B display

Capacity and Efficiency
Airspace can be better utilized by providing the capability for both reduced separation as well as greater predictability in departure and arrival times. Benefits include:

- Radar-like separation procedures in remote or non-radar areas, possibly decreasing travel time
- Support for common separation standards (horizontal and vertical) in all classes of airspace
- Improved ability to manage traffic and aircraft fleets
- Improved air traffic controller ability to plan arrivals and departures for aircraft far in advance
- Infrastructure necessary to operate the National Airspace System at reduced cost

Benefits and Safety
ADS-B/TIS-B/FIS-B services provide several new or greatly improved operational capabilities. Service providers will use the new surveillance capability to enable enhanced Air Traffic Control (ATC) services. Users employ the surveillance and broadcast services capability to support flight operations. These services help to prevent accidents by providing increased situational awareness to air traffic controllers and pilots by providing:

- Air-to-air surveillance capability
- Surveillance to areas that do not currently have surveillance coverage
- Real-time, in-the-cockpit, traffic and aeronautical information (i.e. weather, Temporary Flight Restrictions (TFRs), and special use airspace information)

For further information, contact: Amy Durik   202-385-8394   Amy.CTR.Durik@faa.gov   www.adsb.gov

Aircraft report GPS position to radio sites

Why ADSB?

- Better resolution with 1 second updates verus 30 seconds for radar

- More airplanes in the routes

- More direct routes and lower routes with less fuel consumption and pollution

- Better tracking in more areas

- Better reliability with multiple radio sites tracking versus one radar

Transportation Needs

- Different equipment including weather stations, small server farms, and radio sites
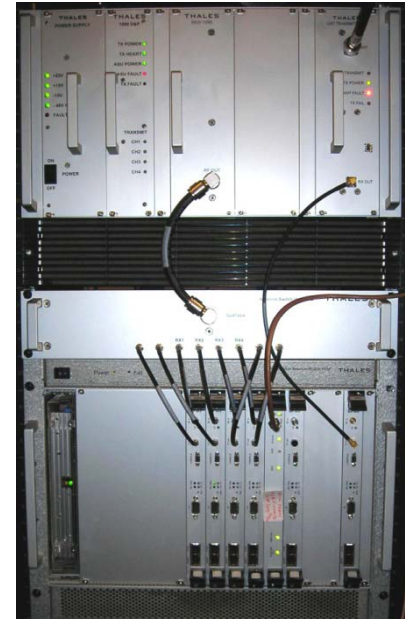
ITT Asset Tag Notes

Currently AWI is attaching ITT Asset Tags to 7 pieces of equipment.

The below table is data from the Eugene Island 215 installation

Item	Description	Model Number	Serial Number	ITT Asset Tag
1	CDP	3000	103	1202224
2	Rain gauge	6021-A	1659	1202232
3	Visibility sensor	8364-E	429	1202223
4	Wind Sensor	2040H	838009	1202233
5	MARS	8190-01	141	1202220
6	DCP	1190	564	1202222
7	Ceilometer	8339-FAA	262	1202221

Table 1. ITT Asset Tags assigned for EI 215 Installation
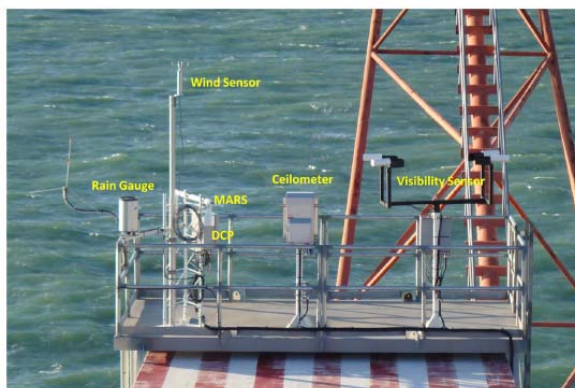

Figure 1. EI 215 Main sensor suite
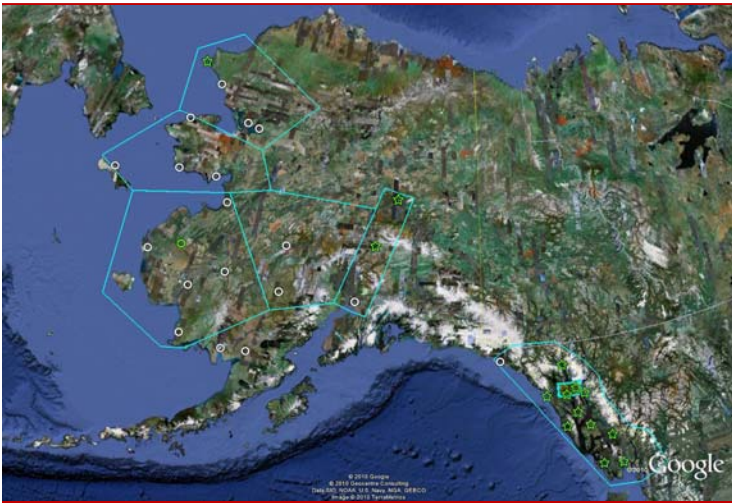
Challenge is getting there

- ITT has radio sites all over the country including Gulf of Mexico and Alaska

Manufacturing And Assembly Facilities

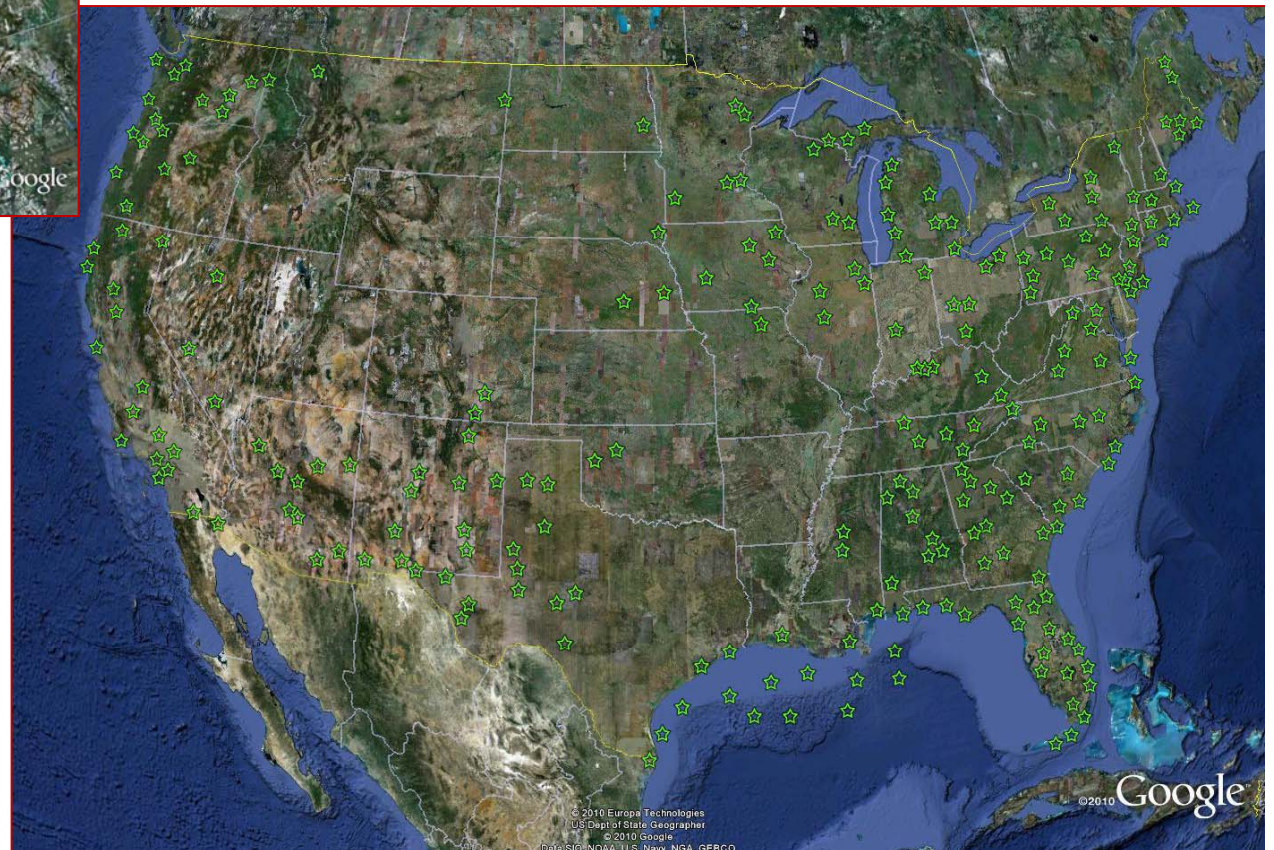Site Materials Assembly Facility and AT&T Router Coding

ITT Deployment

Phase One feasibility demonstration with sites all around the country

Phase Two full deployment around the rest of the country and airport sites

Multi-Lateration deployment to supplement coverage Colorado Mountains at 6-10k feet

Travel is the challenge

- Gulf of Mexico requires space available travel on oil company ships as their guests
  - Time critical, special training, oil operations first
- Travel to Alaska is just as challenging
  - Air freight too expensive so ship goes up by barge in the summer only
  - The weather is fickle, transportation limited, and the natives don't welcome you with open arms so bring cash and be prepared to pay
  - Wildlife sometimes disagree that humans are top of the food chain

Alaska transport points

- We're not at the top of the food chain
- It cost 10 times what you think it will
- It takes twice as long
- Weather changes hourly so be prepared to camp out
- Everyone carries guns in Alaska
- They don't take credit cards so bring cash and see the above point
- No hotels and your sleeping bag in the corner of the village gym is $300 per night
- Food you're on your own – granola bars

Typical Alaska Delivery

- Truck from CO and VA to Seattle
- Barge from Seattle to Alaska major city
- Bush plane or helicopter to site or staging point
- Snowmobile, dog sled or other means to site

- Helicopter may not wait – if weather comes they leave and you may be stranded

Radio Site Delivery – Alaska style
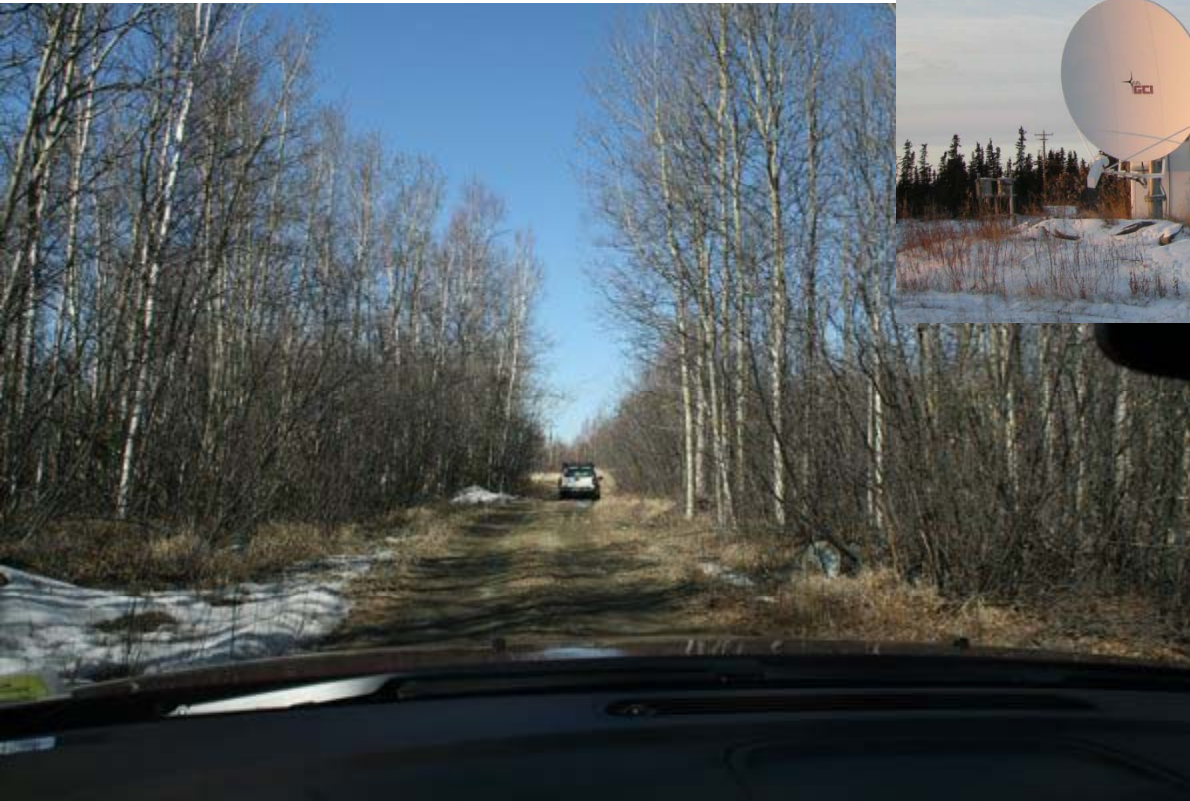
Alaska – Getting there's half the fun

Not the end of the world but you can see it from here!

Gulf of Mexico

- Helicopter or boat to get there
- At the convenience of the oil company
- Special training required – evacuating the platform and safety on the platform
- Weather can be an issue

Oil Platforms in GOMEX

Even CONUS Sites are fun

Communications – critical link

- Schedules for both are critical and delays can be very costly
  - Tower climbers are expensive with remobilization fees of $2,500 - 3,500 plus time on the ground
  - Delays of lost revenue also add up

- Need to be on-time and meet the schedule and get it done in ONE TRIP!

Summary and Questions

- It's challenging, expensive but also very intersting
- Questions?