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TOPICS

- RSW & BHS HISTORY
- PROJECT NEED / OVERVIEW
- CBIS RECAPITALIZATION / OPTIMIZATION
- PROJECT DEVELOPMENT
- DESIGN
- CONSTRUCTION
- CHALLENGES
- LESSONS LEARNED
- PROJECT STATUS
RSW HISTORY

- New 28 Gate Midfield Terminal opened in 2005
- One of 1st automated in-line BHS systems post 9-11
- Initial installation cost = $28M
- In peak periods – handle 2,000 bags/hour
RSW TODAY

- 46 Nonstop Destinations
- 5 International Destinations
- 15 Different Air Carriers
- 7.9M Passengers in 2014
- Jan. 2015 Traffic up 9.9%
BHS HISTORY

- 9/11 - Congress mandated that all passenger baggage be screened at US airports.

- Sixth post- 9/11 automated outbound in-line Baggage Handling System (BHS) in the U.S. to be installed and become fully operational.

- Didn’t have luxury of learning from others mistakes when it came to designing, operating and maintaining such a system.

- Hired a full time maintenance company, Elite Line Services (ELS), to help operate and maintain the system throughout the systems operational life.
BHS PREVIOUS MODIFICATIONS

- **06/07 - $13M Enhancements**
  - Added capacity for 20% increase

- **08/09 - $2.3M Enhancements**
  - Outbound Line Load Balancing
  - Replace Vertical Merge
  - Change pre-screening Merge Logic
  - Maximize delivery/throughput
  - Increased bag speed
  - Greater fail safe controls
  - Greater long term capacity

- **11/12 - $160k Enhancements**
  - Security
  - Relocate photo eyes
  - Add purge logic to incline conveyor
As the BHS approached 7+ years of age in 2012, it was considered one of the “Legacy” systems, and was in need of periodic upgrades to keep up with evolving BHS technologies.

TSA is responsible for reviewing the screening systems at each airport based on the following criteria:

- Number of system downtime incidents
- Length of time of each incident
- Age of system equipment

TSA gives each piece of equipment within the system a priority ranking.

When more than 50% of the equipment within a system has been placed in the high priority ranking for recapitalization, TSA moves to replace all the equipment within the system.
RECAPITALIZATION – TSA OBJECTIVES

- Replace aging inventory of Inline Screening Devices (ISD’s) to meet increasing airport capacity needs.

- Newer and more sophisticated versions of ISD’s are capable of processing bags at higher and more efficient rates than in the past.

- Ultimate number of ISD’s required to process bags is reduced.

- RSW has 7 legacy ISD’s (L3 6000’s) divided in 2 pods
  - East Pod: 4 ISD’s
  - West Pod: 3 ISD’s
  - 1 Stand alone L3 6000 – Oversized bags & CBRA overflow
OPTIMIZATION – TSA OBJECTIVES

- BHS modifications that are changes beyond what is required to support the Recapitalization program.

- TSA Optimization efforts include:
  - Improving system performance
  - Increasing efficiency
  - Enhancing Safety & Security
  - Reducing operating costs
  - Personnel considerations of existing screening areas

- Optimization is typically considered for airport locations where a cost effectiveness analysis shows a 10 year return on the investment for the federal government.
August 2011 - TSA performed an operational review of the BHS at RSW and determined that certain system upgrades should be made in order to ensure a more secure and efficient system.

November 2012 - TSA notification consideration for Recapitalization/Optimization of the system.

March 2013 - LCPA contracted design for system wide upgrades including Recapitalization & Optimization.

December 2013 - Design completed/bid advertised.
RSW PROJECT DEVELOPMENT

FUNDING

- Typically TSA funds between 90% to 100% of costs associated with a Recapitalization & Optimization project.

- RSW Total Project Budget = $7.7M.

- TSA OTA of $7.1M for Construction & PM/CA/CM.
DESIGN FACTORS

- Planning Guidelines & Design Standards (PGDS) version 4.1
- Growth Projections
- System Demand
- System Size
- System Efficiency
- Area Restraints
- Maintenance
RECAPITALIZATION – RSW OBJECTIVES

- Replace 7 legacy ISD’s with 4 new more efficient ISD’s
- New upper & lower level control system hardware
OPTIMIZATION – RSW OBJECTIVES

- Increase Report Server database capacity
- Change PLC Sortation
- New report servers – PGDS compliant reporting
- New graphics servers - Cure excessive PLC scan time
- Cure high error rates in tracking zones
- Mechanical layout changes – better manage pre-ISD bag orientation
- New reinsertion conveyor from CBRA
- New Baggage Inspection Tables (BIT) & Baggage Removal Points (BRP) and hand scanners
- Improve security zone tracking logic
DESIGN ELEMENTS

MECHANICAL

- Replacing pre-ISD decline conveyors for better bag orientation
- Replacing incline belts with updated compliant belts
- Replacing CBRA room TSA tables with new “No Lift” tables
- New reinsertion line from CBRA
DESIGN ELEMENTS

CONTROLS

- Re-control BHS system
- Adding new Programmable Logic Controllers (PLC)
- Replace the aging and obsolete controls hardware
- Adding new Sort, Report and Graphics servers
- Upgrading to compliant tracking and reporting in CBRA
- Optimizing ISD throughput for the new efficient L3 machines
DESIGN ELEMENTS

STRUCTURAL

- Upgrading fire sprinkler systems in CBRA and Checked Baggage Inspection System (CBIS) to code
- Adjust CMU wall opening for BHS conveyor clearance
- Build floor slabs for new ISD’s to raise their relative position to existing conveyors
CONSTRUCTION SCHEDULE

- Phase I Construction
  Start March 2014

- Phase II Construction
  Start April 2015

- Phase II completion
  Expected Fall 2015

- Construction Cost - $5M

- Key construction factors included:
  - Season Constraints
  - Testing Durations
  - Mitigation Practices
  - Contingency Planning
CONSTRUCTION CONSTRAINTS

- November to April (Peak) – Passenger traffic increases exponentially compared to off-season.

- Construction split into 2 phases during the off-seasons of 2014 & 2015 to limit impact on daily operations.

- 5,000 Pax off-season / 20,000 Pax peak season.

- 4x the amount of Pax checking bags during peak season.

- Typical nighttime work window (last flight thru 4am) varied.

- Live system – daily switch back of code (new to old).
CONSTRUCTION – PHASE I

- Start Phase I - April 2014

- Replaced 3 ISD’s (L3 6000’s) with 2 higher efficiency ISD’s (L3 6700’s)

- Demolition & re-routing of conveyors

- Electrical installation & testing

- BHS Fire Sprinkler demolition & re-installation/code compliant

- CBIS/BHS Re-control

- 2 New PLC’s (West Pod)/Reports & Graphic Servers
CONSTRUCTION – PHASE I

- CBRA Room Upgrades
  - Installed new “No-Lift” BIT’s
  - New acoustical ceiling installation
  - Upgraded TSA stations with new monitors & controls

- Testing
  - Internal Testing (A/E)
  - TRR testing (Raytheon)
  - ISAT testing (Battelle)

- System “GO LIVE” - Feb 12, 2015

- “Blackout Period” until start of Phase II – No Code Changes!
CONSTRUCTION – PHASE I

West Pod of 3 EDS machines to be replaced during Phase I construction
NEW ISD’s DELIVERY
NEW ISD’s DELIVERY
OLD ISD’s (WEST POD)
CONVEYOR DEMOLITION
REMOVAL OF OLD ISD’s (WEST POD)
REMOVAL OF OLD ISD’s (WEST POD)
NEW ISD’s INSTALLATION
NEW ISD’s INSTALLED
NEW ISD’s OPERATIONAL
CBRA ROOM
CEILING INSTALLATION

BEFORE

AFTER
CBRA ROOM
NEW TSA CONTROLS & TABLES
CONSTRUCTION – PHASE II

(ORIGINAL PLAN)

- Anticipated start – Post Peak Season (Mid-April 2015).
- Replace East Pod of 4 EDS (L3 6600’s) machines with 2 new, higher efficiency machines (L3 6700’s).
- Construct concrete pads to raise new EDS machine heights
- Electrical installation & testing
- Demolition & re-routing of conveyors
- BHS Fire Sprinkler demolition & re-installation
- Add Reinsertion Line from CBRA
- Testing
  - Internal Testing (A/E)
  - TRR testing (Raytheon)
  - ISAT testing (Battelle)
- System “GO LIVE”
East Pod of 4 EDS machines to be replaced during Phase II construction
CONSTRUCTION CHALLENGES

- CONTRACTOR ISSUES:
  - Unforeseen construction issues
  - Personnel reassignment
  - Ability to meet testing criteria
  - Programming/Programming
  - Contractor Delays

- TSA ISSUES:
  - ISD efficiency changes (L3 6700 ES)
  - Availability of EDS Upgrade Kits
  - TRR/ISAT Testing scheduling/availability over holidays
  - Alternate Screening Procedures (ASP) approvals & limitations
  - Coordination of TSA/Battelle’s “Quick Look Report” Findings
  - Upgrade of legacy machines/training for new CBRA equipment
CONSTRUCTION CHALLENGES

- **Owner Issues:**
  - Construction OTA awarded at 30% Design
  - TSA Design review delays (70%/100%)
  - Airline Coordination/Baggage Hygiene
  - Timely Baggage delivery
  - Response to TSA modifications (ISD’s, UPS, CBRA function/training)
  - Timely approval of changes (TSA allocable costs)

- **Project Delays**
- Resource Burden – “All hands on deck “
- De-Mything “Programming Wizardry”
- Contracts held by different parties
PROGRAM TEAM CHALLENGES

- Many team members
- Many moving parts (LITERALLY)
- Effective Communication
- Personnel Changes
- Availability of experienced or badged workers
- Ownership of problems
- One step forward – two back
LESSONS LEARNED

➢ Recapitalization not as simple as “One-for-One”
➢ Managing expectations of Legacy System performance
➢ Conservative Contingency Planning
  • Power Loss
  • CBIS Mechanical Failures/Dieback
  • CBIS Communication/Control Failures
  • Short Term/Long term
  • Other
➢ Mitigation Practices
  • Manual Portering
  • Alternate Routing
LESSONS LEARNED

- Constant & effective communication
- “Team” Collaborative Effort
- Early TSA project coordination and communication
  - Alternate screening
- Familiarity & uniqueness of project (Customization)
- Buy-in of system’s baseline prior to project
- Contractor abilities & responsiveness
- “Programmer” vs. “Programmer”
- Outline responsibilities early on
- Understanding admin procedures
LESSONS LEARNED

- Ensure FSD is engaged and informed
- TSA funding constraints – allocable costs
- Unforeseen project issues
- Varied nighttime short window
- Scrutiny of contractor’s readiness for TRR/ISAT testing
- Live Performance vs. Testing Performance
PROJECT STATUS

- 2 New ISD’s in operation
- Legacy system & new ISD’s - capacity/performance issues
- Construction “Blackout” period thru April 2015 or later
- Project team currently working on:
  - Addressing “Quick Look Report “ items
  - Re-scoping/Re-phasing project
  - Quantifying unexpected extra $$$
  - Scheduling & contingency planning for next phase or phases
  - Assessing risks
  - Addressing project delays
  - Coordination with TSA on allocable costs/budget
QUESTIONS???