

OEM Views on Emerging Contaminants

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Raytheon ... Who We Are



We are ...

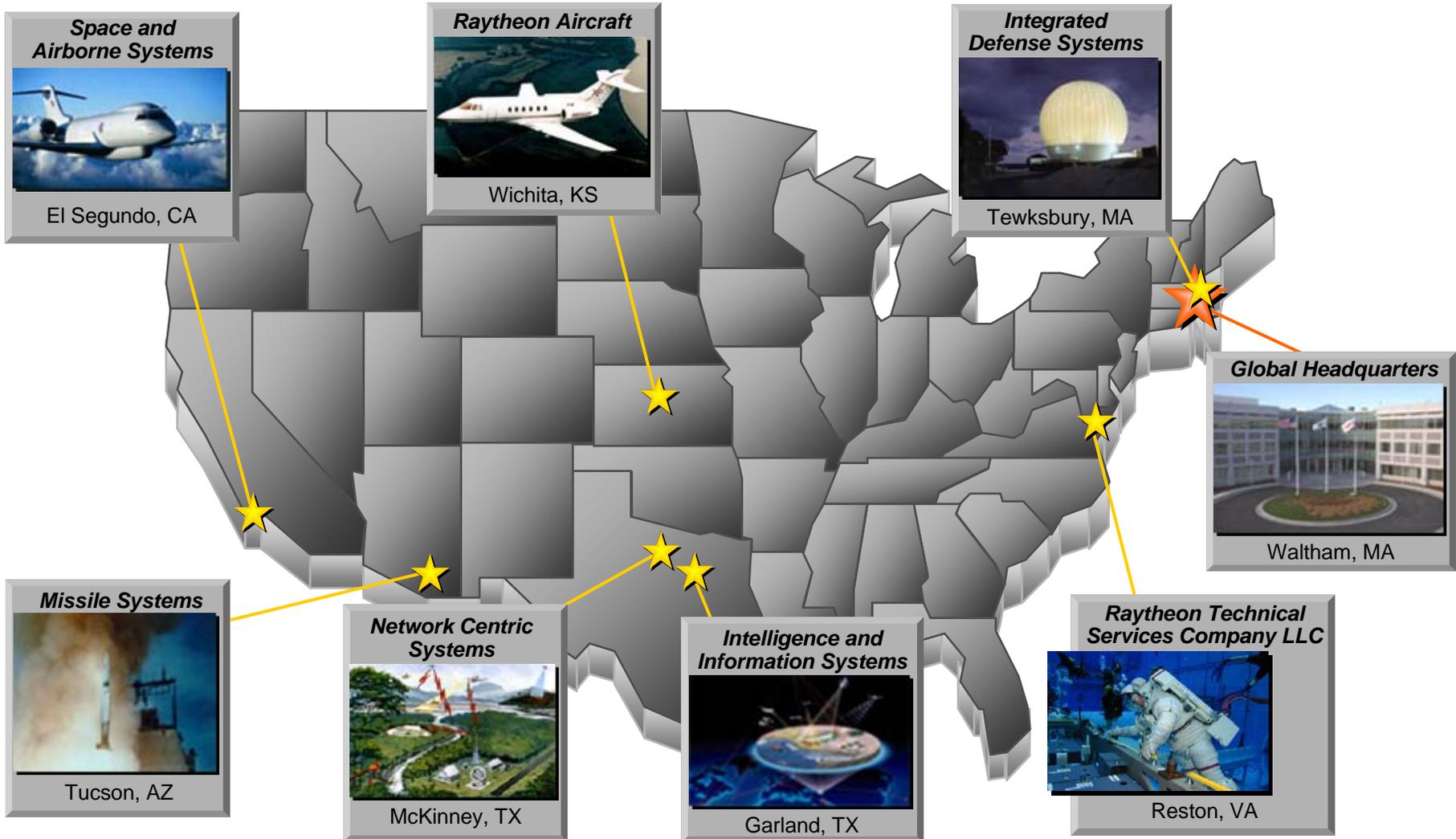
- A Customer Focused company that places the highest value on People, Integrity, Commitment and Excellence
- 2005 Sales: \$21.9 billion
- More than 80,000 employees worldwide
- Headquarters: Waltham, Massachusetts

Our Vision ...

- Be the most admired defense and aerospace systems supplier through world-class people and technology.

Working as One Company Focused on Customer Success

Raytheon Business Headquarters



80,000 employees; 2005 Revenue: \$21.9B

2007 Top EHS Objectives

- *Proactively identify and eliminate risks from operations*
 - Ergonomic risk assessments; computer workstations and industrial processes
 - *Industrial hygiene qualitative risk assessment*
- Actively manage compliance status using the next generation web-based enterprise-wide compliance RPM management system
- Partner with GHR to mature our company culture from injury free to safe & healthy lifestyle

Focused approach to assessing risk

Development of IH Qualitative Risk Assessment Tool (IH QRA)

- Missile Defense Agency Assurance Provisions (MAP)
 - Used as a blueprint for risk assessment approach
 - Ergonomics
 - Industrial Hygiene (IH)
 - Includes risk ranking matrix and metrics for measurement
- Evaluating all process and uses of targeted, high risk substances
 - Once targeted chemical is identified, data is readily available
 - Proactive rather than reactive to regulations
 - Targeted substances include:
 - Asbestos
 - Carcinogens as defined by OSHA
 - Lead
 - Chrome
 - Cadmium
 - Benzene
 - Methylene Chloride
 - Beryllium
 - Cyanides
 - Mercury
 - Hydrofluoric Acid

IH QRA Tool Uses

- Catalogue of known targeted chemical uses and quantities used
- Catalogue of facilities containing targeted chemicals
- Better prepared to discuss issues and concerns with regulatory agencies as regulations are emerging.

If it can't be engineered out, mitigate the risk!

Is this the right direction??

- Benchmarked other industry leaders
 - Intel
 - Johnson and Johnson
 - Ford
- All are focused on developing tools for up-front risk assessment
 - Lower safety statistics
 - Raytheon Lost Workday Injury Rate 0.2 – one of the best in aerospace industry
 - Intel Lost Workday Injury Rate 0.02 – 10X better!
 - Intel's recordable injury rate is higher because they encourage people to report to identify high risk areas
 - Higher employee satisfaction

Industry and Government Partnerships

- Ozone Depleting Substances (ODS)
 - Successful industry / government / military partnership
 - International Cooperative for Ozone Layer Protection (ICOLP)
 - Easy access to regulators
 - Ability to influence regulations
 - Joint meeting in Brussels led to white paper addressing industry concerns on DoD drawing change approvals for alternatives in a timely manner
 - Ultimately created JGAPP
- JGAPP successful and led to SPI development
 - Historically industry driven
 - JGAPP was responsible for advancing technology changes but needed administrative vehicle for drawing changes - SPI
 - Joint success in multiple drawing changes for solvents and paints
 - Currently participation primarily government with little industry involvement unless it is an older initiative

Industry and Government Partnership

- Single Process Initiative
 - Historically successful
 - Example of change for paint process
 - Needed to change 6000 drawings at an estimated cost of \$1500/drawing = \$9M
 - Utilized first “block change” to significantly reduce the cost to implement
 - Current state?
 - No DoD infrastructure to support SPI
 - Management Councils no longer existent
 - Raytheon has 3 SPIs in work – industry still desires to use the vehicle
 - Quality
 - ESD (electrostatic discharge)
 - *Soldering – includes address no lead solder*
 - Making little to no progress

Many successful models have been used

Operational Model

- Most opportunities are leveraged from previous networks
 - Example: Recently shared information on Lead Free initiatives (parts and processes) with the Joint Council on Aging Aircraft
 - Relied on historical contacts to make the connection – difficultly without the network
 - Information dissemination is ad hoc using the networks
- Little connectivity with academia

Not efficient or effective

Opportunities for teaming

- Emerging European regulations
 - RoHS (Restrictions of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment)
 - Purpose: Reduce environmental impacts by prohibiting certain metals and flame retardants in products
 - Effective July 1, 2006, new electrical and electronic equipment sold in EU can not contain:
 - Lead
 - Mercury
 - Cadmium
 - Hexavalent Chrome
 - PBBs, PBDE – flame retardants
 - Additional materials can be added
 - Initial interpretation that military items are excluded
 - Country by country implementation changing views
 - Industry has hired legal counsel in an effort to stay informed

Recap / Refurb Activities

- Extending life cycle of currently fielded products
- Changing the role of the OEM
- Industry needs to change culture
 - Historically only “new build”
- Fielded equipment is returning
 - “Contaminants” present in returned items
 - ITAS full of sand
 - Clouded a factory
 - Bloody handprint on returned unit
 - Obscenities written on returned units
 - Bugs and dust causing grievances with bargaining units

Examples of returned items



Examples of returned items



Impacts of Mixing Processes

- Equipment manufactured with “old” processes using different chemicals
 - Tin-lead solder vs. Lead free solder
 - Not discernable visibly
 - Any compatibility issues??
 - Tin Whiskers
 - ODS solvents vs the new solvents
 - Compatible with the components??
- Suppliers are changing processes without changing the part numbers
 - Example: parts now made with lead free solder has same part number as parts manufactured with tin lead solder.
- Supplier questionnaires surfacing again on hazardous substances – requesting companies to “certify” to various criteria
 - Asking about part number conversions and hazardous material use

Long term effects unknown

Summary

- Many examples of successful industry / government / DoD partnerships
- Ample opportunities to partner
 - Example: Cleaner, Sustainable, Industrial Materials and Processes (CSIMP) Workshop
 - Known as Solvent Substitution Workshop during ODS phase out
 - Used as a great “sharing” mechanism
- Partnership is an ideal way to approach sustainability and risk assessments and must involve all parties:
 - Regulators
 - DoD and the Depots
 - OEMs
 - Academia

Partnership is the only cost effective methodology!