Time for an Upgrade in US Propellant Manufacturing

Teaming for Performance

Alliant Techsystems and Rheinmetall Nitrochemie
2011 NDIA Guns and Missiles Conference
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Presenter:
## Operational Environment

<table>
<thead>
<tr>
<th>WW II</th>
<th>Korea / Vietnam</th>
<th>Gulf War</th>
<th>GWOT</th>
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<tbody>
<tr>
<td>Volume (Quantity over Quality)</td>
<td>Increased investment in technology</td>
<td>Introduction of precision weapons</td>
<td>Precision</td>
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<tr>
<td>Large number or formations</td>
<td>Enemy: Soviet Sponsored States</td>
<td>Stand down of Armor units</td>
<td>Point Targets</td>
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<td>Area denial</td>
<td>Area targeting</td>
<td>Expectation of quick victories</td>
<td>Elimination of Collateral Damage</td>
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<td>Enemy: Large State Actors</td>
<td>10% of the population in Uniform</td>
<td>Enemy: Rouge States</td>
<td>Reduced reliance on Artillery</td>
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<td>Increase in simulation</td>
<td>Reduced reliance on Armor</td>
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<td>Increased reliance on drones</td>
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<td>Enemy: Rouge States and Non State Actors</td>
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<td>Less than 1% in Uniform</td>
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### Propellant Requirement

- Large volumes
- Not Sensitive to Variation
- Lower volumes
- Consistency
- Repeatable
- Sensitive to Variation
Bringing Advanced Propellants to the US DOD Market

Combining Nitrochemie’s Advanced Technology with ATK’s High Volume Manufacturing to Provide our DOD Customers with Key Requirements

Combining Nitrochemie’s modern world class propellant production capabilities with the US Army’s propellant production facility.
Reducing the Footprint

Maintaining the current US GOCO infrastructure is costly: electricity, steam, water, roads, buildings, equipment

By reducing the footprint, one can also reduce the environmental and utility impact

By implementing advanced safety technologies, energetics processing can be consolidated and co-located

Modernization Goals: safe, flexible, scalable, environmentally responsible with low operating costs, high quality product
Safe, Clean, Reproducible, Efficient

A premier aerospace and defense company

- Separate operator from product
- No detonation
  - Separation of production rooms from infrastructure
  - Light walls
  - Fast acting fire detection and deluge
  - Solvent detection and emergency ventilation
- Ventilation of rooms and at source
Nitrocellulose Improvements

- Current US manufacture of NC up to a month
- By implementing pressure boiling, process times can be reduced by 70% with a similar reduction in utilities
- Ability to handle alternative pulp sources – various tree types, various nitration levels
• Bar coding to prevent formulation errors
• Sealed mixing capability and robot addition of ingredients
• Advanced safety controls
• 80% reduction in man hours
Solvent Equilibration and Pressing
Strand Collection and Cutting

• Introducing automation and high speed cutting reduce labor costs by 80%
Modernization is on the horizon for the US Industrial Base

A successful modernization effort will focus on:

- Reducing the footprint and upgrading the infrastructure
  - Maintaining the level of safety and security
- Designing low cost/low labor processes
  - Operations that are scalable and flexible
- Implementing modern environmental practices
- Building a facility that manufactures a high quality product at a competitive price in the market
Thanks and Questions?

Thanks for your attention!

Questions???

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