

El Dorado Engineering, Inc.

Propellant Disposal Technology



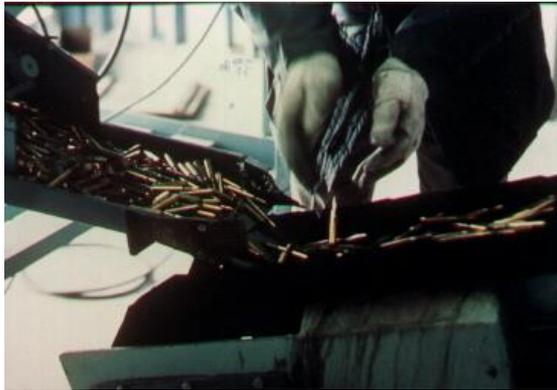
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Non-Open Burning Thermal Treatment Alternatives

- **Contained Burn**
- **Rotary Kiln Explosive Waste Incinerator (EWI)**
- Static Kiln
- “Tunnel” Furnace
- Co-firing
- Contained Detonation
- Car-bottom Furnace
- Transportable Furnaces



Rotary Kiln Explosive Waste Incinerators



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EL DORADO ENGINEERING INTERNATIONAL TURNKEY EWI SYSTEMS

Location

- Lubben, Germany (former East Germany)
- Kahosiung, Taiwan
- Elbasan, Albania
- Shoeburyness, England
- Republic of Korea
- Donetsk, Ukraine
- Zutendaal, Belgium

Client

General Atomics
Arsenal 203
NSPA/NATO
QinetiQ - formerly DERA
Kolon for ROK DOD
NSPA/NATO
Belgium MOD



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Albania EWI

- Turnkey EWI Facility in Albania
 - Client: NAMSA (PfP Trust Fund Project - to reduce regional stockpiles)
 - Facility has safely processing thousands of tons of ammunition

NATO Report (2006): The commissioning of the EWI at ULP Mjekës and its continuous operation is a major achievement of the project. By the end of this year, it is expected that the project will have demilitarized in excess of 6,000 tonnes of ammunition. With the continuous support from donors, demilitarization activities will continue throughout 2007 to meet the original objective to demilitarize 11,665 tonnes of ammunition and continue to improve Albania's demilitarization infrastructure. The management, engineers and workers of ULP Mjekës can be proud of the fact that their work with the explosive waste incinerator is one of the most productive and efficient operations of its kind anywhere in the world.



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Ukraine EWI

- Turnkey EWI Facility in Ukraine
 - Client: NAMSA (PfP Trust Fund Project)
 - Advanced Pollution Abatement System, including Mercury Removal

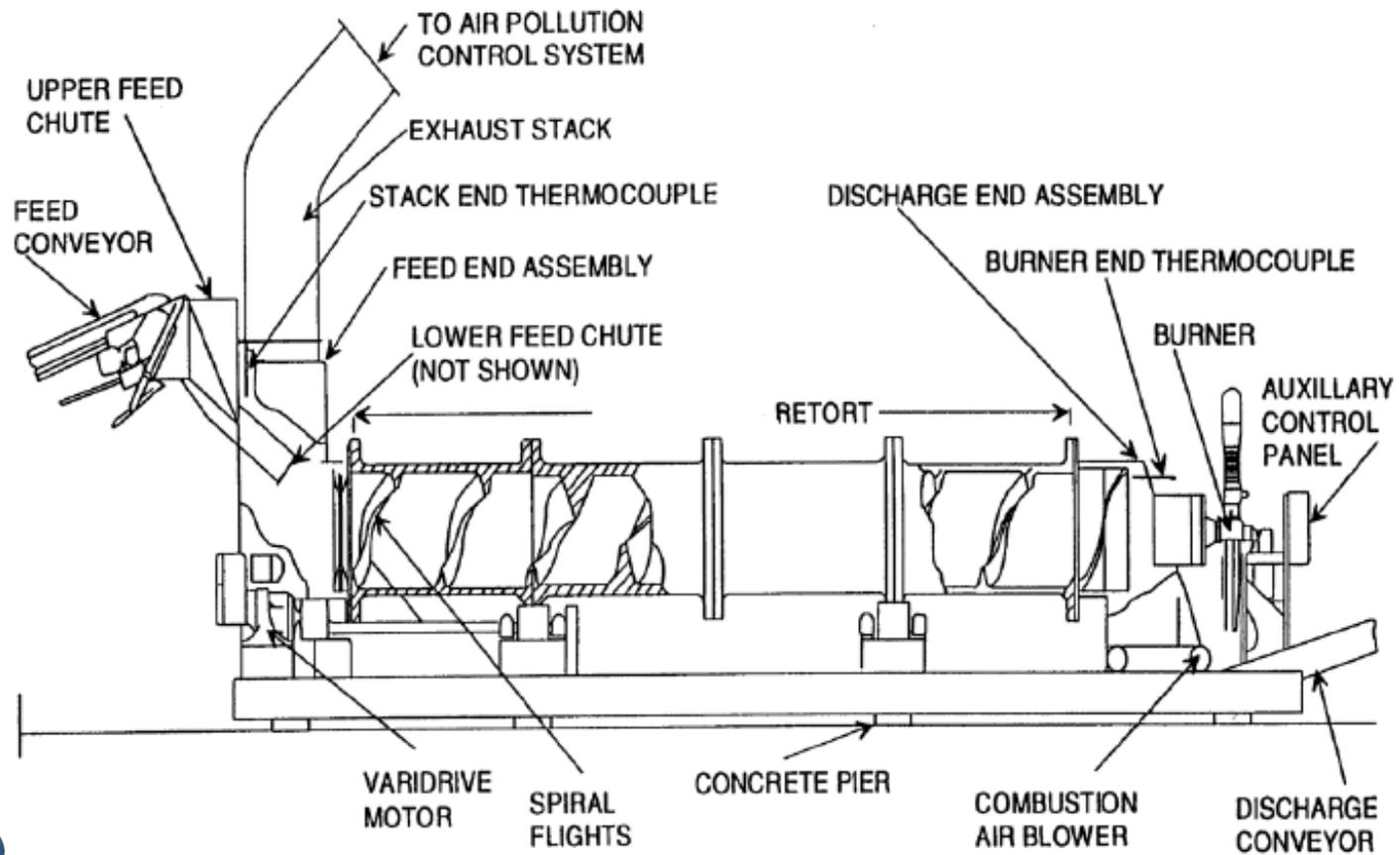


System Elements

- Feed Systems:
 - Conveyor for Configured Munitions
 - Positive Feed System for Bulk Propellants and Explosives
- Armored Rotary Kiln
 - Internal Flights Convey Materials
 - Provide Charge Separation
- Discharge System
 - Separate and Collect Steel/Brass/Lead/Dust
- Pollution Abatement System
- Controls

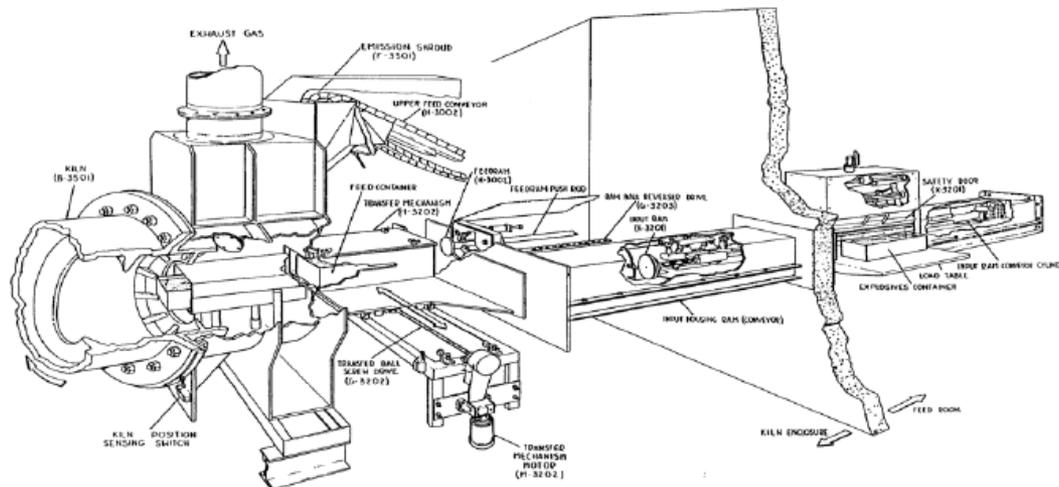


Rotary Kiln



Positive Feed System Designed Specifically for Bulk Propellants

- 5 lb TNT Eq. maximum per feed (safety limit)
- No line of sight
- Controls lock operator out until ready for next feed
- Feed controls only allow one feed per flight
- 2-3 feeds per minute



Throughput

- Highly Versatile
- Small Arms Ammunition: > 20,000 rounds per hour
- Bulk Propellants and Explosives
 - Max. Theoretical up to 500 Pounds/hr
 - Max. Practical Feed Rate Depends on Material Configuration
 - Typical is 150 – 350 Pounds per Hour for Nitrocellulose Propellants



Pollution Control

- Designed for Chemistry of Workload
- Applicable Federal and Local Regulatory Standards
- Stack Emissions Monitored
- System Modules
 - Secondary Combustion Chamber (Afterburner)
 - Gas Cooler
 - Cyclone
 - Baghouse
 - ULPA/HEPA
 - SNCR
 - SCR
 - Carbon Bed Filtration
 - Sorbent Injection
 - Wet Scrubbers



ALBANIA

APCS



TAIWAN APCS



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ENGLAND APCS



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BELGIUM EWI



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BELGIUM Rotary Kiln EWI

- Ran M6 Propellant (155mm charge)
 - Red Bag
 - Lead
 - Potassium Nitrate Flash Reducer
 - Black Powder
- EDE Advanced Pollution Control System
 - Cyclone/ Gas Cooler/ Baghouse / HEPA
 - Fuel Oil Fired High Temperature Afterburner
 - SCR
- Easily Met Most Stringent EU Stds. (BACT/MACT)
- Measured Values when running M6 (3-11-13)
 - Avg. CO: < 1.9 mg/Nm³,
 - Avg. TOC: < 0.5 mg/Nm³ (ND – same as zero)
 - Avg. NO_x: < 0.5 mg/Nm³ (ND – same as zero)
 - Avg. PM: < 0.5 mg/Nm³ (ND – same as zero)



Lessons Learned: Talon Cleanup

Hazardous Mess



Safe and Clean

