Cargo Optimization and The Cold Chain

Power Solutions for Refrigerated Transport

“Power Pool Plus is the World Leader in the Manufacture of Power Solutions to the Refrigerated Transport Industry Since 1990.”

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Topics of Discussion

• Pressures on the Cold Chain
• Various Power Solutions Throughout the Cold Chain
  • Their Advantages and Disadvantages
• Case Studies
Market Realities

• **Panama Canal Widening** – Bigger ships adding additional pressure to the entire cold chain

• **Pressure to ‘Go Green”** – Seeking alternative fuel infrastructure to reduce carbon emissions such as; electrification.

• **Seasonal Spikes in Imports** – Forecasting production and demand and investing limited resources to meet these spikes puts continued pressure on aging infrastructure

• **Port Expansion** – Pressures to increase throughput causing infrastructure upgrades or a move to outward to inland ports.
Fundamental Problem Statement

Keeping refrigerated / frozen cargo connected to reliable, affordable power, is a challenge to all partners within the Cold Chain.

The pressure of new construction, larger ships, and traditional seasonal spikes makes the problem even tougher to manage!
Ground Power

Advantages:

- Once installed can be inexpensive ($0.05 – 0.07/kW hour)
- Minimal Maintenance
- Safe with little exposed power supply

Disadvantages:

- Fixed Outlets – at times can never be exactly where you want them.
- Not Flexible – 300 plugs, but you need 301!
- Some regions have reliability / cost issues
- Very Expensive Installation Cost
Power Packs

Advantages:
• Very inexpensive to purchase and / or rent
• Highly flexible solution which is easily moved anywhere in the port
• Ideal for seasonal spikes and during port construction projects
• Shipboard Capability

Disadvantages:
• Fuel burn around 20 gph for 40 reefers
• Require maintenance
• All plugs (30-60) in ONE location

Ensure a quality purchase, NOT price!
This machine is protecting YOUR COLD CHAIN!
Clip-On / Underslung Gen Sets

Advantages:
- Readily available for “Grab and Go”
- Rugged construction
- Designed for reefer power
- Power exactly where it's needed

Disadvantages:
- HIGH operating costs
  - Burns 1 gph / 40 Reefers = 40 gph!
- PM Service for multiple units
- VERY few manufacturers to work with
- Low fuel storage – 48 hours max.
  - Impractical for ship board use
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Mobile Reefer Yard

Advantages:
• LOWEST operating cost per plug
  • Only 36 gph for 100 plugs
• No extension cords needed
  • Plugs can be set close to reefer stacks
• Rapid deployment

Disadvantages:
• Not valid for shipboard use
• Requires a load schedule that keeps the generator working at all times
• Care needed to protect cables
Unique Applications

Case Studies Highlighting

- Barge Power
- Temporary Power During Port Expansion Projects
- Reefer Traffic Through Inland Ports
Specialized Power Solutions - Barge

• **PROBLEM:** Overcrowded port which has adjacent facility with additional available capacity. However, not cost effective to truck cargo to nearby facility.

• **SOLUTION:** Barge cargo to adjacent terminal using dual engine power pack to maintain Cold Chain during transit.

• **BENEFIT:** Operator was able to handle additional cargo, and better leverage all its available capacity.
Winning Contracts - Power During Construction

Scenario:
• Fruit producer wanted to save money by changing where its cargo was being received, potential port did not have the 300 plugs available to support the new business.
• Port needed to install 300 plugs to its terminal, however construction would take **18 months to complete**!
• Port rented Power Packs and Mobile Reefer Yards in order to meet the short term need, while permanent plugs were installed.

Everybody Wins:
• Fruit producer reduced its freight costs
• Port won new business **without having the necessary infrastructure in place**!
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**Overcrowded Ports – Reefer Power for Inland Ports**

**Scenario:**
- Pressure on existing real estate at ports and terminals due to larger ships is forcing more cargo to shift inland for staging.
- Existing area for reefer allocation is limited on terminal.
- Typical inland ports are nothing more than open gated yards with no infrastructure to support electrical needs for reefers.

**Strategy**
- Use untapped inland ports for reefer cargo.
- Try Power Packs/Mobile Reefer Yards as temporary solutions for inland port projects until a business model makes sense for more capital infrastructure.
In Summary

• Global reefer traffic is predicted to continue to grow over the next 5 years lead by the meat and exotic fruit sectors.

• As reefer traffic grows, the canal expands, and new ships come online, the need for more reliable, cost effective, power will continue to grow and ports must be creative in moving reefer cargo and utilize all means necessary to power these loads.

• There are a variety of solutions to address this demand, each with its own advantages and disadvantages . . . One size does not fit all!

“Reliable, cost effective power is critical to protecting YOUR valuable Cold Chain Cargo!”
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Thank you.

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