# Material Handling Opportunity Charging

# Stanley Black and Decker (Kannapolis DC)

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# Safety and Environmental Stewardship Is = Stanley Black and Decker's "Right To Operate" In The Communities We Serve

## For Our PEOPLE

*We* empower every employee to embrace safety, recognize their peers for positive habits, and address at-risk behavior

## For Our LOCATIONS

Reduce workplace accidents by implementing and institutionalizing injury reduction practices

## For Our OPERATIONS

Operate within a sound environmental, health and safety management system that defines our commitment and monitors our progress

## For Our PRACTICES

Provide training and upskilling to assure compliance with all Stanley Black & Decker programs and practices

**…..For Those Who Make The World**

# Agenda

- Background
- Material Handling in a Distribution Center
- Material Handling @ Kannapolis DC
- Opportunity Charging @ Kannapolis DC
- Benefits So Far and Going Forward
- Questions & Open Discussion

## Background

- Kannapolis DC was built in 1995.
- Currently about 960,000 sq. Ft.
- Anywhere between 300 to 400 employees.
- Receiving Stanley Black and Decker branded tools and processing them to fulfill customer orders.
- Located in Concord, NC. Cabarrus County.
- Certified ESI Steward since 2015.

# Material Handling in a Distribution Center


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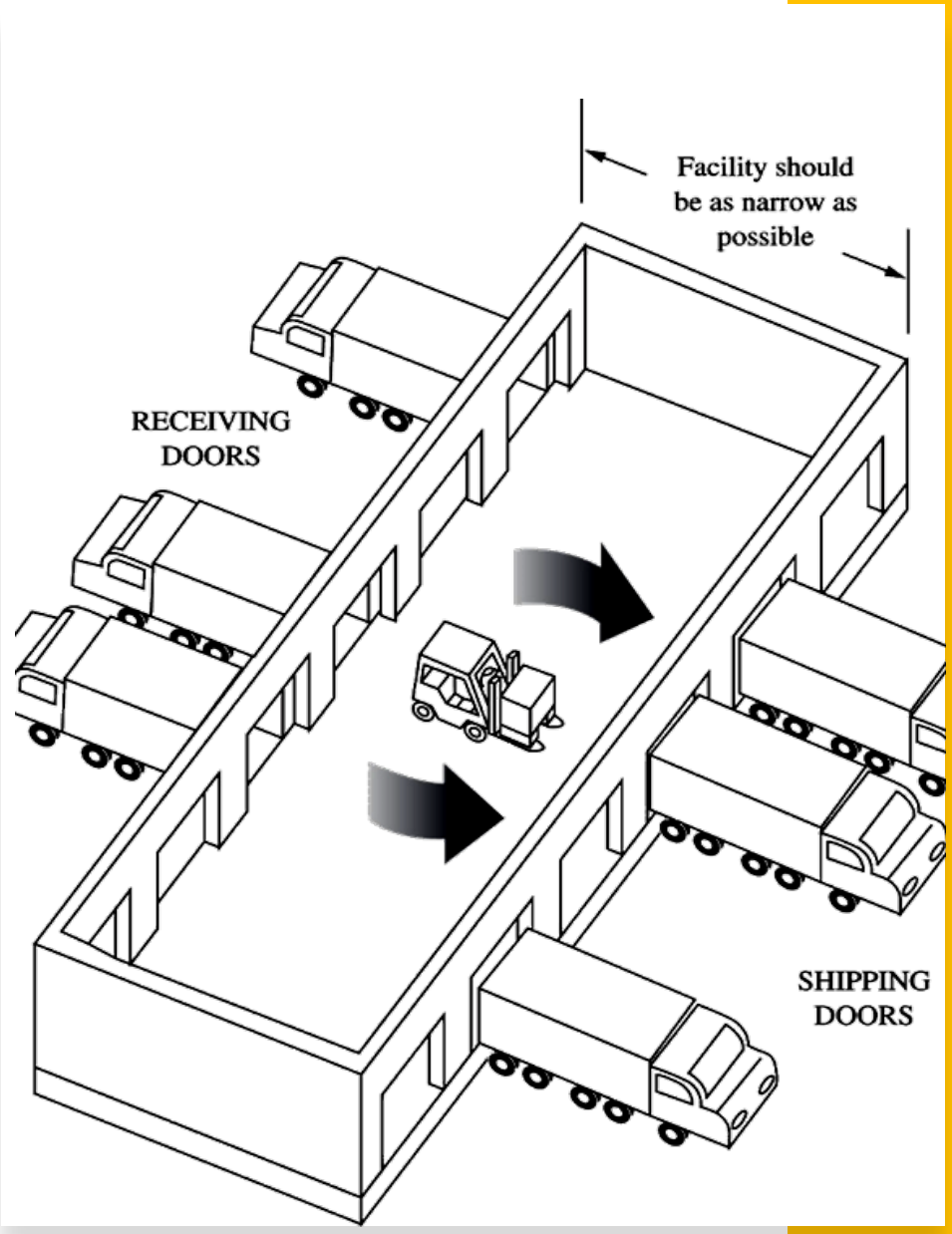
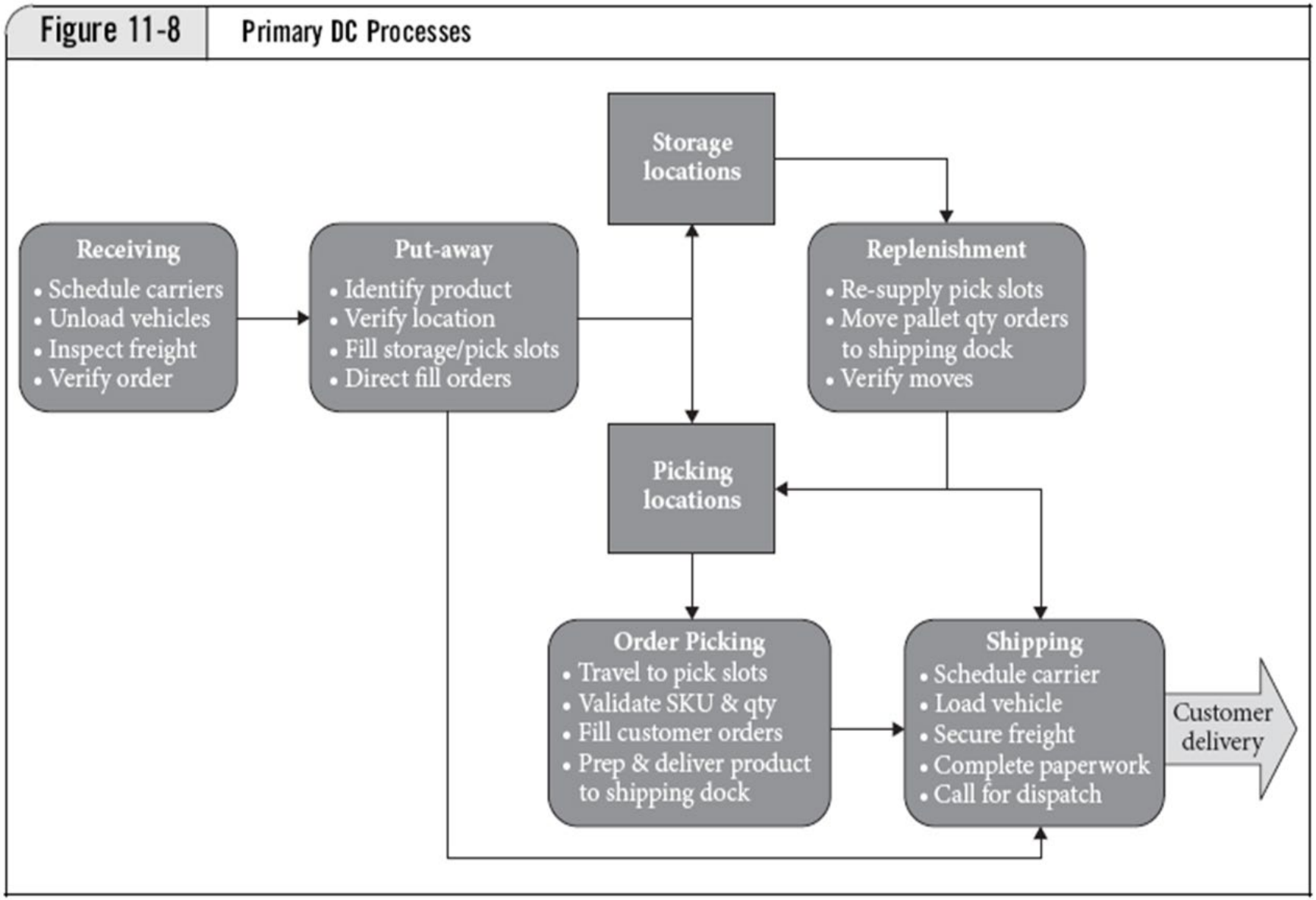
# Material Handling In A Distribution Center (DC)

- A DC is a location where stocks of material are held on their journey through supply chains.
- Functions of Distribution Center include
  - Transportation consolidation
  - Product mixing
  - Docking
  - Service
  - Protection against contingencies



# Material Handling In A Distribution Center (DC) (cont.)



# Material Handling In A Distribution Center (DC) (cont.)

- A critical component of a DC operation is having a material handling system for moving goods around the facility.
- Material handling – Movement of materials for short distances generally within the DC.
- Some actions requiring material handling;
  - Moving goods to bulk storage areas and holding them in stock until needed.
  - Moving materials from bulk storage to smaller picking locations.
  - Unloading and loading Vehicles.
  - Cross-docking
- Aims of Material Handling?
  - Moving materials around the DC as required.
  - Moving materials quickly while reducing the number and distance of movement.
  - Reducing cost by using efficient operations.

## Material Handling In A Distribution Center (DC) (cont.)

- Material handling equipment can be broken down into 4 main categories
  - Storage and Handling Equipment
  - Engineered Systems (AR/RS, Conveyor systems, Robotic Delivery systems, automatic guided vehicles).
  - **Industrial Trucks (Powered industrial trucks or Vehicles, PITs or PIVs).**
  - Bulk Material Handling Equipment (Conveyors and Stackers)

## Focusing on Industrial Trucks (Powered industrial trucks or Vehicles, PITs or PIVs).

- Used move large materials or large quantities of materials.
- Utilized to efficiently load (or unload) heavy objects onto delivery trucks.
- Several types;
  - Hand Trucks
  - Pallet Jacks
  - **Pallet Trucks**
  - Walkie Riders
  - Platform Trucks
  - **Order Pickers**



## What is the Opportunity with Electric Forklifts?


- Commonly used indoors in warehouses.
- Electric forklifts produce zero emissions.
- Run more quietly than internal combustion forklifts.
- Powered by large lead-acid batteries.
- **Batteries must be routinely charged.**
- Designated area for battery charging.

## So What If Any, Is the Problem?

- Conventionally, electric PIVs are operated for one shift and then charged on the next shift or overnight.
- Because batteries heat up during charging, they will need to cool down for another 8 hours before being used again.
- Conventional charging is ideal for single-shift operations.
- To not experience downtime, additional batteries must be purchased for each shift (at least 2 batteries per truck).
- Employees changing batteries between shifts, a potential chemical hazard.
- Environmental concerns such as dropping the battery or spilling electrolyte.
- Impacting productivity negatively.
- Potential higher repair costs.
- Expensive battery changing equipment.

# Opportunity Charging

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# Opportunity Charging-A Wise Alternative?

- Involves charging a battery at available opportunities throughout the shift.
- Work Breaks, Scheduled Lunches, Shift Changes etc.
- Downtime that provides a chance for the battery to be plugged in for at least 10 mins can be used for opportunity charging.

# The Sales Pitch on Opportunity Chargers

- Batteries take an average of 4-6 hours daily to fully recharge.
- Good choice for extended or multi-shift operations.
- More equipment use per shift.
- Reduced maintenance.
- Less time and effort required due to elimination of battery switch-out process.
- Reduced downtime.
- Reduced number of batteries and equipment needed for work.
- More space availability due to not needing battery changing space.
- Extends the run time of aging (older) batteries.

## What the Other Guys Say.

- Opportunity chargers are normally set to charge a battery up to 80%-85% SOC throughout the day and back to 100% only once a day (during night hours).
- Shorten a battery's useful life (The more charging, the more degradation).
- Operators must be aware of what needs to be done when forklift is not in use.
- Battery monitoring identification is recommended.

# Opportunity Charging @ Kannapolis DC




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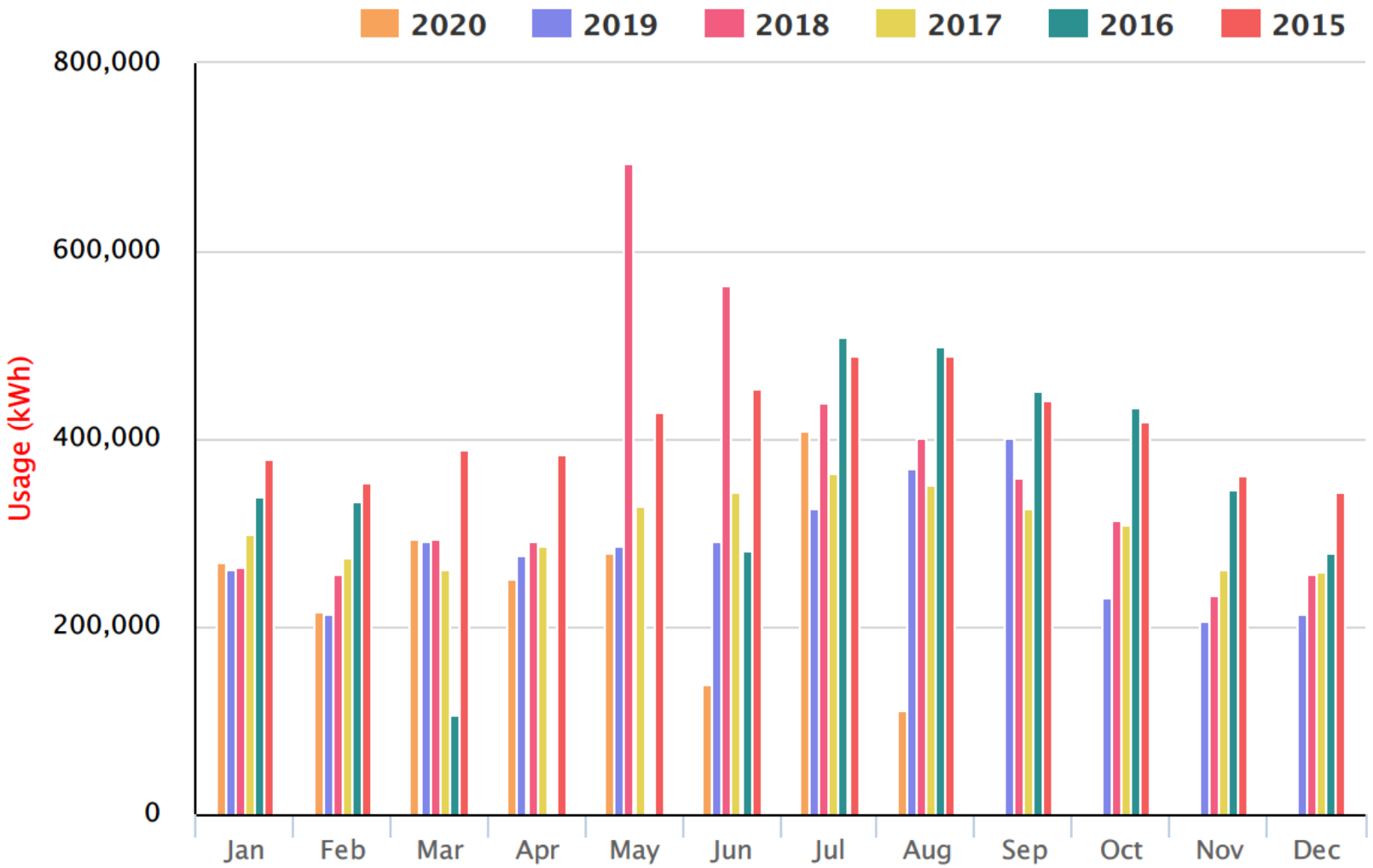
# We Decided to Find Out for Ourselves.

- Since 2015 till date the site has installed **50 Opportunity Chargers.**
- The total cost of installation **$150K**


## How Opportunity Charging Has Benefitted Us.

| | 2015 | 2020 | % Decrease |
|---|---|---|---|
| Number of Electric PIV | **114** | **84** | **26** |
| Number of Lead Acid Batteries | **265** | **149** | **44** |

# ...More Results-ELECTRICITY USE



# ...More Results-ELECTRICITY USE (Cont.)

| | Electricity Usage Average (kWh) | Total Cost ($) |
|---|---|---|
| 2015 | 411,833 | 481,176 |
| 2019 | 281,886 | 297,901 |

38%

## Impact on Tier Two Reporting

The purpose of a Tier Two Hazardous Chemical Inventory Report is to provide State and local officials and the public with specific information on hazardous chemicals present at your facility during the past year.

This information is used by local Fire Departments for personnel training, hazmat pre-planning and local/regional response to spills and releases.

The annual update and accurate information in a Tier II can help firefighters and hazmat technicians respond to your facility with the correct personal protective gear and spill response equipment, preventing injury or death.

Ability to reduce the amount of Extremely Hazardous Substances (EHSs) and all other Hazardous Chemicals from a facility is beneficial as a whole in protecting life.

# Impact on Tier Two Reporting (cont.)

- Lead Acid Batteries are used for Electric PIV Operation.
- The 2 major chemical component of Lead Acid batteries are **Lead** (45-60% by weight) **and Sulfuric Acid** (15-20% by weight).
- Lead is classified as a Hazardous Chemical with a minimum reporting threshold of 10,000 pounds (or 4.540 kg).
- Sulfuric Acid id classified as an Extremely Hazardous Substance (EHS) , with a reporting threshold of 500 pounds (or 227 kg.)

# Reduction in Tier II Reportable Quantities

| | 2015 | 2019 |
|---|---|---|
| **Number of Lead Acid Batteries** | **265** | **149** |

| **Tier II Reportable Quantities** | | |
|---|---|---|
| | **2016** | **2020** |
| **Sulfuric Acid** | 133,162 lbs | 74,872 lbs |
| **Lead (Lead Compounds)** | 310,712 lbs | 174,702 lbs |

## ...and there you have it.

- Lower Electricity Consumption.
- Less number of spills reported in the past 5 years.
- Lower cost of maintenance and servicing of batteries.
- Increased productivity & Efficiency.
- Ability to invest in other continuous improvement projects.

# THANK YOU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