Pallet Rack Safety and Maintenance

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Why the Sudden Interest?

- More collapses occurring today
- Taller systems
- Increased use of used rack and “blending”
- Worker health and safety
- Liability concerns
Your Worst Nightmare!
Why do collapses happen?

Who is involved in the process?

- Integrator, distributor or consultant
- Warehouse operations
- Manufacturer
Integrator/Distributor/Consultant
(specifies system)

- Miscommunication of design parameters
- Incorrect design of the system
- Incorrect truck clearance
- Reduced rack capacity to decrease price
- Incorrect use of repair kits

Warehouse Operations

- Rack damage
- Incorrect load weight
- Altering of configuration
- Change in operation
- Incorrect use or misuse of equipment
Warehouse Operations

- Pallet maintenance
- Change in equipment and or operators
- Reducing rack capacity to reduce price
- Lack of driver training
- Mixing components from different manufacturers

Manufacturer

- Designed incorrectly
- Poor craftsmanship (AWS/CWS standards)
- Non existent and or poor welding procedures
- Inconsistent welds by non certified welders
- Lack of clarity on design parameters
Acceptance by Building Code

Storage Rack referenced standard in the - International Building Code (IBC)

We are now PART of the building code

International Building Code

1. IBC has been adopted as the basis for building codes in all 50 states.
2. Different states use different IBC editions.
3. States adopt “model” code with modifications are law.

IBC references specifications that become part of the governing state law are enforced. This includes RMI for rack structures.
OSHA

Now that the RMI/ANSI 16.1-2008 is mandated by law; OSHA is becoming active in rack safety inspections

If you have properly a documented system, along with an active inspection and maintenance system in place you can minimize your exposure to citations, fines, and liability.

What Should I Do?

- Take control of the situation
- Contact professionals to conduct a safety audit
- Develop a driver-accountability strategy
- Develop ongoing rack safety audit program
- Install and maintain capacity plaques
Steps in Audit

- Locate initial design drawings and calculations
- Document existing elevations and layouts
- Perform structural inspection for damage, anchorage, rack lean, signs of distress
- Determine the extent of damage if present
- Develop a plan for repairing the rack
- Keep a set of current configuration drawings on hand

Steps in Audit

- Proper documentation is your best defense against claims and OSHA / Building inspector mandated fines and facility shut downs
- Without proper documentation the company has undefined liabilities and YOU can be personally responsible if serious injury or death occur
- Always consult with the manufacturer prior to re-slotting to ensure feasibility
Steps in Audit

- Doubling the vertical shelf spacing can reduce the frame capacity by 75%!
Starting Fresh

- Develop the best material handling solution
- Ensure that all lift truck clearances are approved by the lift truck vendor
- Generate elevations for **ALL** potential slotting configurations
- Develop an impact protection strategy

Starting Fresh

- Generate a set of concept drawings for owner review and approval
- Consider fire protection, egress, lighting, etc. in the system design
- Consider appropriate clearances for safe and productive operation
Maintenance

- Ensure that the racks are inspected for damage on a periodic basis
- Develop repair criteria for damage
- Ensure that all re-profiling is reviewed by vendor's engineering department
- **DO NOT** utilize repair kits unless approved by original rack manufacturer

Maintenance

- Insist on driver training certification for all new operators, and recertification for existing at appropriate intervals
- When damage occurs, immediately unload bay until repair is completed
- RMI: “Any damage must be repaired or replaced”
Repair Kits

- The design of the repair kit needs to be done with the approval of the original manufacturer.
- The bracing system has to be designed in conjunction with the original frame.
- The liability for any failure may rest on the owner.
Designing for Durability

- Material – structural vs. roll-formed
- Horizontal spacing
- Boxed or double columns
- Rub rails / heavy horizontals at the floor
- Post protectors / bull noses
- Multiple anchors
- Bolt in pallet supports

Safety Accessories
Protect Your Rack System

Post Protectors and Bull Noses

Column Boxing
Safety Accessories
Protect Your Employees

Row end Protectors

Safety Accessories
Prevent Frame Damage

Rub Rails
Frame Design Solutions

Unique frame options designed to prevent rack damage and improve productivity

Severe Cant Leg Frame Double-Deep Rack

The severe cant leg, swept back 36" from the rack face to a shared rear base plate, allows clearance for fork lift base legs on either side of the floor level pallet - reducing required bay width from 102" to 96"
Cant Leg Frame
Push-Back Application

The Severe Cant Leg Frame maximizes space for fork lift turning area without increasing aisle width.

This application designed for floor level pallet storage below 3-deep pushback

Severe Cant Cripple Leg

The addition of the cripple leg to the severe cant frame, allows for an additional shelf elevation below the bend of the cant leg column, increasing the number of pallet positions.
Side Mounted Drive-in Rub Rail

Row end protectors are used as a continuous rub rail and pallet guide – preventing frame damage and improving driver accuracy/productivity.

Severe Cant Leg – Monopost Frame

The frame/monopost severe cant-leg design is an economical alternative to the typical frame/frame deep reach configuration. It utilizes a mono-post on the aisle column that is swept back 36” from the rack face.

This design eliminates 1 column per frame-line and 1 shelf beam per level thus reducing the steel required.
Bridge Leg

A bridge leg frame within a double deep system creates needed space for fork lift outriggers within a standard 96” bay opening.

Double-Boxed Frame with Base Runner

A boxed rub rail is used to form a base runner vs. traditional base plates for added fork lift abuse resistance.

Column boxing on both front and rear columns of the frame.
Set-Back Frame

Set-back frame for the overhead dock storage system.

The frame was placed into a pit located on either side of the docking station, allowing easier access to motor controls for the dock doors located in the front of the frame.

Recessed I-Beam Frame – Deep Reach

This heavy duty design removes the bottom portion of the front column allowing the outrigger legs to slide under the I-Beam reducing the required beam width and creating additional pallet positions.
Case Flow Knuckle Frame

This case flow knuckle frame incorporates an interior support column within the frame depth to help support heavy duty case picking of wine.

The interior support column allows for a knuckle shelf tray to be added.

Seamless Tube Upright – Grape Rooms

Standard column boxing on the front column is replaced with a sealed tube to prevent the seepage of corrosive gases needed to kill insects.
The initial cost of a rack system is 3% of the total cost of operating a dry warehouse facility over its 30 year life.

- Sysco Foods

Peace of mind comes with a more durable, safe and efficient rack system investment along with a preventive maintenance program.