SERVICE BULLETIN

Title: **TS–384 Rigging Pedestal Certification**
Models Affected: **19C, 19EA, 17/19FA**

Number: **C9319**
Date: **12/10/93**
Supersedes:
Date:

Purpose:

To communicate the guidelines under which the TS-384 Rigging Pedestal is to be used.

File: Compressor–Motor–Drive–Gears

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Background:

The BSS field organization utilizes an adjustable caster frame gantry with a manual hoist to remove compressor components. The manufactured gantry, which carries rating labels indicating its lifting capacity (typically 4,000 lbs @ 14 ft. span and 6,000 lbs @ 10 ft. span), can't always reach across a compressor and its base so a pedestal has been developed which allows one end of the gantry to be bolted to the bearing inspection flange of various centrifugal chiller compressors.

In accordance with the requirements of the Occupational Safety and Health Administration (OSHA) 29 CFR 1910.179 (b) (3) "cranes may be modified and rerated provided that such modifications and the supporting structure are checked thoroughly for the new load by a qualified engineer...".

This bulletin summarizes the review of the modified gantry including the performance of load testing in accordance with OSHA guidelines.

Existing Gantry System

General:

The adjustable gantry purchased by the BSS field organization is used to perform field service work. It is a standard gantry that is manufactured similar to B.E. Wallace Products Corporation's model number 1-408151. This gantry is rated at a capacity of 4,000 pounds (2 tons) at a span of 14 feet and 6,000 pounds (3 tons) at a span of 10 feet.

Gantry Modification:

The BSS field organization modifies the four legged "A" frame gantry to allow the gantry to be positioned over closely spaced equipment that would otherwise be inaccessible to the four legged system. The modification involves the removal of one of the "A" frame support legs at an end of the gantry beam and the attachment of this free end to a vertical structural steel pedestal (rigging pedestal) that is fastened to the bearing inspection flange of the compressors from which components are to be hoisted.

The gantry beam is fastened to the pedestal by 1/4 inch thick clamping plates. The pedestal is made adjustable in height by the use of two pipe sections sized such that an inner pipe slides within a slightly larger diameter base pipe. The pedestal is positioned to the appropriate height in 2 inch increments using a 3/4 inch diameter pin. The maximum extension of this pedestal is approximately 48 inches.

The base plate of the pedestal is pre-drilled to fit the bolt patterns on all of the compressor bearing inspection flanges. At least four bolts are used to attach the pedestal to any of the bearing flanges.

Proposed Use:

The gantry is used by the BSS field organization to remove components of various Carrier centrifugal chiller compressors including rotors or stators. The maximum load that is lifted with this modified gantry is slightly less than 3 tons (the 19C XX stator weighs approximately 5900 lbs).

Evaluation

General:

This section presents an engineering analysis of the rigging (pipe) pedestal. Since the capacity of the gantry beam and the "A" frame support legs are unaffected by the placement of the rigging pedestal at one end, the engineering analysis focuses on the rigging pedestal and its connections. This section will show that the capacity of the rigging pedestal is capable of supporting the end reaction of the gantry beam when the system is utilized within the posted capacity limits of the gantry defined as 4,000 pounds at a 14 foot span and 6,000 pounds at a 10 foot span.

Engineering Analysis:

The engineering analysis of the rigging pedestal is based on several conditions that exist with the system:

- The rigging pedestal is not required to resist any lateral loads as the gantry is supported at one end by the caster wheeled "A" frame.
- The trolley on the hoist is not capable of resisting loads parallel to the gantry beam, and therefore, no longitudinal loads are induced to the rigging pedestal by the hoist.
- The bearing inspection flange of the centrifugal chiller compressors are capable of withstanding the vertical loads that the rigging pedestal exerts to the housing.

Given these conditions, the theoretical load capacity of the pedestal extended to the maximum height of 48 inches is calculated to be in excess of 9,500 lbs (4.75 tons).

Load Testing:

In accordance with 29 CFR 1910.179, the modified gantry must be tested at 125 percent of the desired rating capacity. On 24 September, 1993, Carrier Corporation set-up the modified gantry in the Syracuse, NY, facility in a manner that simulated its use in the removal of components from chiller compressors in the field. A certified weight of 8,000 pounds was positioned below the hoist. The hoist was then used to lift the weight after which the trolley was moved from the center of the span towards the rigging pedestal.

No adverse deflections, strains, or other movements were visually detected during the lifting of the 8,000 pound load which induces a vertical load in excess of 125 percent of the maximum specified weight (1.25 x 5,900 lbs = 7,375 lbs).

Based on the results of this engineering analysis and on-site testing, the gantry crane utilizing the rigging pedestal can retain its current rating of 4,000 pounds at 14 feet and 6,000 pounds at 10 feet provided the following conditions are maintained:

- The gantry crane and rigging pedestal are erected and utilized by personnel experienced and trained in their use.
- Lateral loads should NOT be induced into the assembly by any means including, but not limited to, the use of blocking to prevent the movement of the caster wheels, the use of a motorized trolley, and the use of cables to restrain movement.
- Use of the assembly for purposes other than those intended as described in this bulletin should not be conducted until they are reviewed by a licensed structural engineer.

Procedure:

Hard copies of this bulletin will be mailed to all BSS service offices along with two Certification Labels. Please attach two labels to each TS-384 rigging pedestal the office owns. Place the labels on opposite sides of the outside pipe, between two of the four vertical columns of holes such that it is visible at all times during use. Do not place the label over the holes.