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BEST PRACTICES: MULTI-TON COMPONENT REMOVAL/REPLACEMENT UTILIZING AIR CASTERS

John Massenburg
AeroGo, Inc.
Seattle, WA, USA

Terry Pitsch
AeroGo, Inc.
Seattle, WA, USA

Jesse Farmer
AeroGo, Inc.
Seattle WA USA

ABSTRACT

Power plants originally designed to be decommissioned at 20-30 years are extending their service life by removing/replacing major power plant components. This requirement is contrary to the original floor and workspace designs engineered for power plants. Feedwater heaters, casks, heat exchangers, and other very large (50' ±) and heavy (20-100 ton) components can overcome floor and space restrictions by using a combination of air casters and cranes. This proven methodology saves in excess of 75% the cost of a standard crane-only operation and significantly reduces the possibility of permanent floor damage.

Air caster transport systems are low profile and easily insert under industrial heaters, exchangers, transformers, etc. The casters raise components and carry them across the floor, spreading the multi-ton weight across the surface area without damage to the floor or component. Air casters are frictionless even with the heaviest loads, and significantly reduce ergonomic risk while also providing the benefit of requiring a reduced workforce to move the component across the floor. Controlled drive systems allow a single operator to easily move components omnidirectionally without wheels or rails, and into position within .5 inches/13mm accuracy. Proven effective in existing nuclear plants as noted in the ICONE paper presented by Tokyo Power.

Air casters, often coupled with cranes, significantly lower material handling costs associated with new installation and repair/refurbishment of components up to and over 5000 tons. Air casters operate on normal compressed air and have very few moving parts, resulting in low ongoing maintenance costs.

INTRODUCTION

Early prior research demonstrated the superiority of ceramics for bearings (1, 2) and the existence of elasto-hydrodynamic (ehd) lubricant films at ball and roller contacts (3), the calculation of which is now an accepted part of bearing engineering. These new concepts are now used in the design of lubrication systems with solid lubricants that operate in much more severe environments than oils and greases (4, 5). Proprietary computer codes and unique patented bearing configurations for optimizing the performance of bearing/solid-lubricant systems have been developed (6, 7 and 8). In this way, patented self-contained solid-lubricated all-steel and hybrid-ceramic ball and roller bearings are now available for environments that do not contribute to their lubrication, such as in air or vacuum.

NOMENCLATURE

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REFERENCES

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Easily Move 220-Ton Loads with Air Casters: a proven innovation in material handling.

AeroGo air caster transport systems prevent damage to concrete pads by providing nearly frictionless movement of heavy loads. Controlled drive systems allow a single operator to easily move and position storage casks within .5 inches/13mm accuracy. Proven effective in existing nuclear plants.

- Ultra Low Friction
- Omnidirectional Movement
- No Floor Damage
- Low Profile

AeroGo air casters can be purchased at a lower initial investment compared to crawler tractors used for typical nuclear applications. And air casters cost less over time, as they operate on normal compressed air and have very few moving parts. Add or remove individual casks in the storage area on a non-fixed travel path - unlike a wheel/rail system. AeroGo air casters are ISO 9001:2000 certified. For more information, email info@aerogo.com or visit www.aerogo.com.

ABOUT THE AUTHOR: JOHN MASSENBURG

John C. Massenburg is President of AeroGo, Inc. He has directed expansion of custom engineered solutions to develop a robust and reliable transporter set of products, used throughout the world to move transformers, feed water heaters, nuclear casks, ships, caissons and myriad projects up to 5,000 tons. Under his leadership, AeroGo has grown its international presence and distributor network. Massenburg previously served for seven years Custom Product Group Manager and Director of Sales and Marketing. Before joining AeroGo, Massenburg was President of TFE Construction, a property development firm; Senior Project Engineer at Flow International Corporation for five years and a Mechanical Engineer for Boeing Military Aircraft. Massenburg holds an M.S. and a B.S. in Mechanical Engineering from Washington

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ANNEX A

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