Vertical Transportation eXcellence
Elevator and Escalator Consultants

Momentum

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Sustainable Design – New Elevator Technology

In recent years, there has been greater emphasis on using sustainable design practices. Sustainable design is a philosophy that includes earth-friendly techniques, involving sustainable site selection/ development, water efficiency, material selection, indoor air quality, waste recovery while improving energy performance and maintainability.

VTX takes pride in incorporating new ideas such as sustainable/"green" design and energy conservation into our projects, where appropriate. We are an active proponent in the principles of sustainable design and have incorporated this philosophy on projects and in our core business practices. We continue to demonstrate commitment to designing high-performance, energy-efficient, and environmentally friendly projects.

Our dedication to implementing sustainable technologies and systems focuses on improving personal performance through an improved working environment using more efficient and cost-effective elevator systems. Informed decision-making and design thinking must continue during all phases of the project to guide the design team or building operators through the sustainable considerations.

One of the bases of sustainable-building practice is equipping a facility with energy-efficient technologies. Not only does this make certain the facility will comply with mandatory building standards that require reduced energy consumption, it also enables building owners and operators to optimize energy performance.

Machine-Room-Less Technology

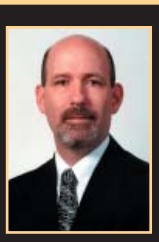
Machine-room-less (MRL) technology fits the ecologically sustainable design principle and has literally changed the history of elevator technology through innovations that are friendly to the environment. MRL technology incorporates smaller, gearless or highly efficient geared machines, typically using variable-speed and variable-frequency drives with the latest digital technology. These smaller and more efficient machines represent a significant improvement in power consumption by as much as 60 percent over hydraulic elevators.

The MRL elevator manufacturers are promoting easier and quicker installation times while benefiting from a smoother, quieter ride as compared to a hydraulic elevator. With elevators accounting for up to two percent of energy consumption in a building, a customer can gain significant energy savings using MRL vertical transportation solutions.

Hydraulic Elevators

Many say MRL technology is going to eliminate hydraulic elevators from the market. Hydraulic elevators have a shorter life expectancy than traction elevators and are subject to repair and/or improvements that are not applicable to traction elevators.

Hydraulic elevators pump hydraulic fluid to a cylinder/plunger assembly that results in vertically moving the piston that raises the elevator cab up and lowers it back down. The conventional cylinder/plunger assembly resides in a well hole directly beneath the elevator and years ago these assemblies



David P. Hansen, Q.E.I.
Vice President

Friday, April 22 was Earth Day, so what can we do in the elevator industry to help improve and protect our environment? Each and everyone one of us needs to be sensitive of the impact that our professions have on today's environment. This is our Earth, our Community, and our Future.

This issue will address current technology being implemented within the elevator industry that incorporates designs that improved elevator efficiency and maintainability. In recent years, many elevator manufactures have developed various designs of "Machine-Room-Less (MRL)" elevators.

While emphasizing the benefits of the MRL technology, this article will also review potential drawbacks when evaluating the application for your building(s).

We sincerely hope that you find this information helpful in your day-to-day activities. Feel free to e-mail me directly at dhansen@vtexcellence.com.

were installed with little or no protection from the subsurface elements. Without the ability to inspect the assembly beneath the surface, the possible damage to the cylinder that would ultimately result in a hydraulic fluid leak goes unnoticed. When this condition occurs, it typically results in the contamination of the soil and possibly groundwater.

The repair of the elevator is not covered by any maintenance contract and the cost for the cylinder/plunger assembly including required remediation of contaminants can be as little as $30,000 and in some instances greater than $100,000. Cost will vary greatly due to the unknown condition of well holes and their ability to incorporate PVC liner protection that would require costly drilling.

Keep in mind that hydraulic elevators need to be provided within a controlled environment requiring additional heating and in some instances air conditioning. Remote piping running underground is another potential problem for temperature control as well as potential leakage.

Traction Elevators

Traction elevators are driven by a machine that incorporates steel hoist cables that ride over a drive sheave and are typically affixed to a counterweight assembly and car crosshead. In the case of overhead traction elevators, you need to provide for a penthouse structure that encloses the elevator equipment and supports the elevator loads. MRL elevator equipment is typically rail mounted and transfers loads to the elevator pit. MRL elevator design usually incorporates a lower overhead requirement and allows for designers to provide the desired sleeker roof line appearance.

With the avoidance of a machine room, you can reduce heating and cooling loads typically required. Standard steel hoist cables require lubrication and some MRL elevator manufacturers use innovative rope and belt designs that eliminate the lubrication requirements.

LEED® (Leadership in Energy and Environmental Design)

LEED certification distinguishes building projects that have demonstrated a commitment to sustainability by meeting the highest performance standards. By design, MRL elevators save space and energy, reduced waste, and is basically oil free. A natural fit for those concerned with sustainable building. Even if facility owners are not interested in developing a LEED-certified project, they are still interested in learning how they can save energy and money. MRL technology allows them the benefits of lower operating costs.

Benefits

MRL technology delivers higher energy efficiency located within the hoistway resulting in a reduction of electrical consumption, lowers lifecycle costs, eliminates the need for overhead penthouse construction, minimizes heating and cooling requirements, improves durability and maintainability while eliminating the need for soil/water contaminating hydraulic fluid that serves to protect our environment. The cost of MRL elevators fall between that of a hydraulic elevator and an overhead traction elevator.

Draw Backs

Unlike the commonly acceptable hydraulic and traction elevator standards, sizing and space requirements differ amongst the various MRL manufacturers. These differences are in hoistway plan and elevation footprints. These various footprints make it difficult to provide a design that enables participation of each MRL elevator manufacturer. While there are constraints with footprints the various manufacturers of MRL elevators have limitations to travel, openings, capacities, and speeds.

At this point in time, MRL technology is highly proprietary. This situation results in a forced long-term relationship for preventive maintenance between the owner and MRL elevator manufacturer. "Customizing" elevator designs is extremely limited to manufacturer's standard options for car enclosures, entrances, and operating/signal fixtures. VTX

ASME Code Corner

By: Patrick J. Welch

This column is intended to discuss new or existing rules and interpretations that may affect the operations or planning of your vertical transportation systems. The rules within the A17.1 Code are intended to be clear and unambiguous, but there are sometimes unintended consequences to the rules that leave the reader confused as to the intention of the Code.

Each subcommittee of A17.1 addresses interpretations at their regular meetings to help assure a prompt and responsive clarification. This is particularly important when new rules come out each year; it is not unheard of for a rule to confuse either a designer or an inspector within a jurisdiction trying to figure out what the intent of a new rule was.

I encourage anyone with a question to a particular requirement's meaning to contact me directly, or write to ASME A17.1 requesting a formal interpretation. The format for the inquiry is clearly stated in the first section of A17.1.

There are a few important issues to understand:

1. A new rule is always intended to be clear and precise, but can fall short.
2. The subcommittee gets the request for interpretation from the Standards Committee and is charged with investigation and to propose a response.
3. The Standards Committee makes the ultimate decision, not the subcommittee.
4. Check previous interpretations for potential resolutions brought by others before you.
5. Finally, request an interpretation yourself if you cannot determine the intent of a particular rule.

We at VTX deal with code issues on a regular basis. It is very likely that your question is not new to us, and we can help quickly. It is not uncommon for us to bring a request for interpretation for our clients before A17.1. Just remember that ASME wants the requirements to be clearly understood, so get it clarified, it could dramatically affect your project or operation! VTX