



Applying the ASME A17.1 Elevator Code to Elevator Modernization

This article focuses on the modernization and alteration requirements of the 2004 national ASME A17.1 Elevator Safety Code as defined in section 8.7. Each local jurisdiction may have different requirements based on different editions of ASME A17.1 or local requirements differing from A17.1. A secondary focus will be on modernizing elevators for facilities that demand a 24/7/365 usage situation.

The first step in understanding how to apply the Code is to understand the difference between a repair and an alteration, or modernization.

Alteration: any change to equipment, including its parts, components, and/or subsystems, other than maintenance, repair, or replacement¹. [For the purpose of this article, “modernization” shall be used in lieu of the phrase, “alteration”].

Repair: reconditioning or renewal of parts, components, and/or subsystems necessary to keep equipment in compliance with applicable Code requirements¹.

Examples of both conditions are presented in the following table:

Component	Is a Repair, when:	Is an Modernization, when:
Door Operator	New, but a direct replacement.	Upgraded control, AC to DC or VFAC.
Machine Room	No modernization permitted to diminish ventilation or requirements for temperature and humidity requirements of elevator manufacturer.	No reduction in headroom permitted below existing conditions, or as 2.7.4 requires.
Elevator Car or Hall Button Panel	New, but a direct replacement.	Non lighted buttons to lighted buttons.
Elevator Cab	Change in weight is less than 5% dead weight and rated load.	1. Change in dead weight and rated load by more than 5%. 2. Permanently close all side emergency exits.
Elevator Controller	Repairs to components, but keeping same operation.	Relay based to solid state Change in drive Part of larger modernization.
Elevator Control Valve	Repairs to components only.	Valve is of different type, special rules apply to speeds higher than 100 FPM.

¹ASME Section 1.3 Definitions

As you can see from this very short list in the table, an elevator modernization can quickly become complicated. Careful coordination of your building outside the elevator equipment itself is required. Therefore, before any elevator modernization, you must consider the following tasks:

1. Why are you thinking about modernizing your elevator?
2. Do I only need partial upgrades and repairs?
3. Is this all I need to do?

Unlike a new construction project, elevator modernizations are rarely designed by an architect or engineer planning the total building project. This means that an elevator modernization often causes problems for owners during the project and at times, after the elevator portion of the project is completed.

This is often due to the fact that the elevator Code requires more work than a typical elevator contractor is trained to do. Many of the common coordination issues likely to be encountered are outlined later.

Thinking about modernizing your elevator?

It is important to examine the reason a modernization is being considered and determine your goals in an elevator modernization. Do not simply trust your elevator contractor



Patrick J. Welch
President

Welcome to the first edition of our e-Newsletter. We are looking forward to showcasing our clients, projects, and company resources with each issue. In addition, we look forward to conveying information as appropriate, about emerging trends, new regulations, and programs that effect both the way we and our clients conduct business. We hope you will find this e-Newsletter both informative and enjoyable.

The focus of our first issue is to share some of our experience on complicated elevator modernization projects. Future editions will share advance information on the ASME A17.1 code changes and interpretations. Since I am a member of several key committees, this e-Newsletter will be a good source of code information for anyone associated with elevators and/or escalators.

We sincerely hope that you find this information helpful in your day-to-day activities. If there is something you would like to see in future editions, please e-mail me directly at pwelch@vtexcellence.com. 

who claims that your equipment is obsolete. Most of the time replacement parts can be purchased from many reputable sources, including the Original Equipment Manufacturer (OEM).

A careful review of your maintenance agreement should verify what is and is not included. We are often called to review elevator modernization agreements and find that up to half the value of their proposal includes work already included in the existing maintenance agreement!

This article is not intended to answer all conditions related to elevator modernizations, but will provide a few questions for consideration:

1. **Improved reliability?:** Covered repairs may get you what you need if you can enforce your current maintenance agreement.
2. **“Faster Elevators”:** You may not need faster elevators; you may need smarter elevators, using smarter dispatching technology. Remember though, if you don't have enough elevators to start with, modernization may not solve this problem.
3. **Obsolete elevators:** There are certainly obsolete, unreliable elevators that should be modernized.

Do I only need partial upgrades and repairs?

Now that you have carefully reviewed your elevator situation, you may determine that you only need to enforce the terms of the maintenance agreement you have with your elevator contractor. You may also determine that you need to only replace certain components to achieve your elevator improvement goals.

Is this all I need to do?

This is perhaps the most important question that requires consideration. Since elevator modernizations are complex problems, this article can only highlight the most common elevator modernization questions that you need to resolve before proceeding with an elevator modernization.

Assuming that you have resolved the scope of work and the goal of your elevator modernization, the following list includes the most common Code issues that require careful coordination and concern.

1. Is this elevator on emergency power now? How will it operate after the modernization?
2. Does the machine room now require air conditioning?
3. Is the present electrical system adequate for the new elevator drive system?
4. Is there any non elevator equipment in the elevator machine rooms that must be removed?
5. Are there any changes to the hoistway, pit, or machine room construction?
6. How is the elevator connected to the fire alarm system?

The acceptance test is a vital phase of your project that helps you ensure that your project complies with code and is ready to improve your facility operations.

A final note on elevator modernizations: Be wary of pre-engineered elevator systems. Those types of systems are not designed for the 24/7/365 environment a hospital encounters. They are good elevator systems – for department stores, apartments, and office buildings. 

Elevator Modernizations Tips:

1. Consider increasing the starts per hour ratings on the hoist motors, especially for hydraulic elevators.
2. Determine if VFAC drives are regenerative or non regenerative.
3. Obtain BTU ratings from bidders based on HP and starts per hour.
4. Get drawings for approval on any piping changes considered as part of hydraulic modernizations.
5. Consider a heavier duty elevator door operator; there is a Housing Authority model more appropriate for hospital use than department store models.
6. Add “Z” brackets to all hoistway and car doors.
7. Use vandal resistant fixtures.
8. Upgrade the class loading on elevators when laundry carts, X-ray machines, or other devices are going to be used. If you don't specify this, you will get a class A design prohibiting the loading of more than 25% of the elevator capacity in one load.
9. Consider defining “generic controllers” instead of the OEM standard.
10. Make sure that every step of your modernization is consistent with your overall goals.
11. Finally, remember that when you take an elevator out of service for modernization, the balance of the elevators will have to take that load. This means that they will probably breakdown more than they did before you started. It may get worse before it gets better when modernizing a bank of elevators. This makes the maintenance program a vital part of preparing for the modernization!

For further information on emergency power and grounding considerations for elevator modernizations, go to www.vtexcellence.com and go to the Technical Library. 

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