

New Minnesota Elevator Code Requirements



New Minnesota Elevator Code Requirements-Existing Buildings

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Retroactive Requirements



Retroactive Requirements For Existing Buildings

- New Elevator Code – MN Rule 1307 adopted by the State of Minnesota effective **January 29, 2007**
- Governs the design, installation, maintenance, repair, replacement, modernization and demolition of vertical transportation equipment
- Unlike previous code adoptions, the new version of Minnesota Rule 1307 – Elevators and Related Devices; includes provisions for replacement of specific components deemed unsafe by the code

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Retroactive Requirements For Existing Buildings (CONT.)

- Retroactive provisions include time delay of up to 60 months for enforcement
- Minimum safety testing requirements-annual and five year cycle
- Mandates minimum level of safety equipment for all existing units
- First code revision to require detailed maintenance system/record keeping data base

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Retroactive Requirements with Enforcement Delay-All Existing Buildings

- Replacement/Modification of all single Bottom Hydraulic Cylinders - 60 month enforcement time delay
- Restricted Opening of Car and Hoistway Doors on Passenger Elevators – 60 month enforcement time delay
- Fireman's Service Operation - 60 month enforcement time delay
- Escalator Step/Skirt Performance Index Test and Loaded Gap Test – 36 month enforcement time delay for modifications
- Maintenance System/Record Keeping database – Required upon adoption

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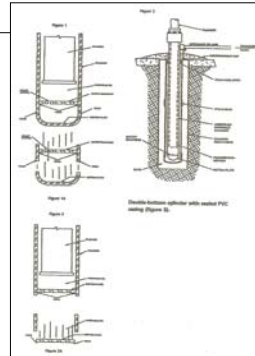
Replacement/Modification of All Single Bottom Hydraulic Cylinders

- ❑ All hydraulic cylinders manufactured prior to 1972, which were designed with single bottom construction, will require replacement or modification on or before **January 29, 2012**.
- ❑ Effective **January 29, 2008**, Owners of all non compliant hydraulic cylinders must submit a notarized statement verifying the unit has passed all code required safety tests and an oil usage log is being properly utilized on each unit.
- ❑ A copy of the test report must be submitted with the statement. (ASME A17.3 2002 4.3.3)

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Single Bottom Hydro Cylinder



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Plunger Gripper



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Existing Hydraulic Elevator Check List

1. What is the manufacture date of each hydraulic elevator in your facility?
2. Has the hydraulic system been modified or upgraded since installation?
3. Has a "Plunger Gripper" or similar device been installed on your hydraulic system?
4. Has the hydraulic system been last tested within the last year?
5. Has the hydraulic system test report and accompanying notarized statement been sent to the State?

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Restricted Opening of Car and Hoistway Doors - Passenger Elevators

- ❑ Effective **January 29, 2012**, Code Compliant door restricting devices will be required on all passenger elevators.
- ❑ These devices prevent unauthorized personnel from exiting the elevator cab between floors. (ASME A17.3 2002 2.7.4)
- ❑ Several different types of door restrictors are available, installation dependant on current door equipment design.

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Existing Elevator Door System Check List

1. What is the manufacture date of each elevator in your facility?
2. Does your current passenger elevator system include a device which prohibits the car doors from being opened outside of the unlocking zone (+/- 18" from the floor)?

NOTE: Door restrictors were required on all new and modernized equipment effective with the 1996 code. Many of these devices have been disabled, removed or are not in working order. If your elevator equipment was manufactured after 1996, door restrictors should have been provided.

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Fireman's Service Operation

- Effective **January 29, 2012**, all elevators must conform to the requirements of ASME A17.1 1987 Rules 211.3 through 211.8 or later edition for Fireman's service operation. (ASME A17.3 2002 3.11.3)
- Exception – Existing elevators are exempt if the following conditions are met:
 - Elevators with less than 25 feet of travel above or below the designated (egress) level. Or,
 - Elevators with less than 35 feet of travel above or below the designated (egress) level which were installed with Phase I and without Phase II and include recall of the elevator from a smoke detector at each landing, the elevator equipment room and the Phase I key switch at the designated landing.

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What is Fireman's Service Operation?

- Fireman's Service Operation is a two part system (Phase I & Phase II) which removes the elevators from public service during an emergency for use by emergency personnel
- Phase I – Recall: A Key switch located at the main egress landing hall call station or, in certain buildings, the fire command center when activated, captures and returns the elevators to the lobby
- Phase II – Fireman's Operation: A key switch inside each car which allows the elevator to be operated by trained emergency personnel during emergency situations

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Existing Fireman's Service Check List

1. What is the original installation date for each elevator in your building?
2. Has the elevator control system been modified since installation? If so, what is the date of the modification and the scope of work conducted?
3. How far does the elevator travel, up or down, from the designated (egress) level?
4. Does your existing system include Phase I (main landing) and Phase II (in car) operation?

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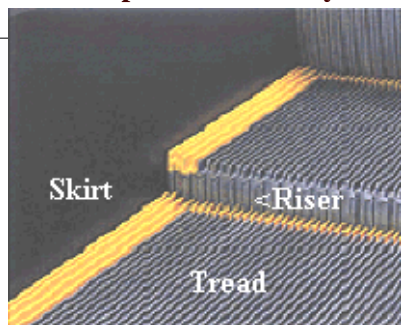
Escalator Step/Skirt Performance Index Test and Loaded Gap Test

- Effective **January 29, 2007**, Step/Skirt Performance Index - Loaded Gap testing is required on an annual basis for all escalators designed for passenger traffic.
- Where an existing escalator requires alteration to be compliant, all work must be complete by **January 29, 2010**. (ASME A17.3 2002 5.1.11)
- Limits clearance between step and skirt panel
- Limits skirt deflection
- Requires skirt panel to be in good condition

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Escalator Step Skirt Assembly



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Escalator Step/Skirt Index Check List

1. Has a Step/Skirt Performance Index – Loaded Gap test been successfully conducted on each escalator in your facility within the last year?
2. Has the required test report been forwarded to the State?
3. Do you have a copy of the latest test report on file?

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Maintenance Records

- Effective **January 29, 2007** a written Maintenance Control Program shall be in place to maintain all equipment in compliance with Section 8.6 of the elevator code. (ASME A17.1 2004 8.6.1.2.1)

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Elevator Maintenance Program Minimum Standards

- Minimum Maintenance Program requirements shall include but not be limited to the following:
 1. A record of maintenance tasks and completion dates
 2. Description and dates of examinations, tests, adjustments, repairs and replacements
 3. Description and dates of call backs or reported malfunctions and any corrective action taken
 4. Written record verifying testing of fireman's service operation as required by code.
 5. Cleaning, lubrication and adjustment of applicable components
 6. Monthly monitoring of hydraulic oil usage

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Elevator Maintenance Program Minimum Standards (CONT.)

7. The maintenance procedures and intervals shall be based on:
 - a) Equipment age, condition and accumulated wear
 - b) Design and inherent quality of equipment
 - c) Usage
 - d) Environmental conditions
 - e) Improved technology
8. Instructions for locating the Maintenance Program records shall be posted in or on the controller along with instructions for reporting any corrective action required to the responsible party
9. Maintenance records shall be kept at a central location and be accessible to elevator personnel

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Minimum Required Safety Equipment – Existing Installations

1. Non contact door re-opening device's required. Mechanical safety shoes which require contact are prohibited
2. Emergency telephone or communication system required inside the car. i.e., ADA compliant hands free telephone
3. A work light and GFCI protected outlet is required on the car top, bottom and pit
4. A Pit ladder is required in each elevator hoistway
5. Emergency hoistway door unlocking device required for all elevators with keys stored in an approved lockbox
6. Minimum lighting level in machine room of 19 foot candles at floor level

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Minimum Required Safety Equipment – Existing Installations (CONT.)

7. Equipment room signage posted for all machine rooms and equipment rooms in buildings without 24 hour security or maintenance staffing
8. All machine rooms shall be provided with natural or mechanical means to maintain temperature for safe operation of the elevator
9. All keys used to operate elevator equipment shall not operate any other device in the building and shall be grouped for security as required in ASME A17.1 2004 8.1 All keys required for elevator operation shall be stored in an approved lock box in the machine room
10. Fire Extinguisher is required in each elevator machine room
11. A permanent code data plate shall be provided on the main line disconnect or controller indicating the Code to be used for inspections. The data plate shall indicate the Code and version in effect at the time of installation and the Code in effect for any alterations.

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Case Study



Case Study-Building Description

- ❑ Four story commercial office building
- ❑ Elevator control system - 1978 vintage relay control, duplex operation
- ❑ Motor Control – DC hoist motor/Generator drive
- ❑ Total rise 38', 4-stops
- ❑ Fireman's Service – Phase 1 only

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New Code Requirements for Case Study

- ❑ Door Restrictors
- ❑ Fireman's Service
- ❑ Maintenance Records
- ❑ Minimum Safety Equipment
- ❑ Inspections And Tests

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Door Restrictors

- ❑ Existing door operators do not have restrictor device.
- ❑ Code compliant restrictor devices will have to be installed or door operators will have to be replaced as part of modernization
- ❑ If modernized, door operators will require new door clutches and pick-up rollers at each landing
- ❑ Existing hoistway door panels are not labeled for fire rating.
- ❑ Estimated Cost: New restrictors only - \$3,000.00 per elevator
- ❑ Estimated Cost: New door operators, new restrictors, new clutches and rollers - \$25,000.00 per elevator

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Fireman's Service

- ❑ Existing control system does not have Fireman's Service Phase II operation – required for building rise over 35 feet
- ❑ Estimated cost to retrofit existing relay logic controls with Phase II operation: \$25,000.00 - \$35,000.00 per elevator based on 1987 code or 50,000 to 60,000 based on 2004 code
- ❑ Complete controller modernization with new motor controls recommended; Modernization project includes replacement of the controller, motor generator, hoist motor, all operating fixtures, hoistway switches and associated wiring
- ❑ Estimated cost: \$180,000.000 per elevator - plus related building work

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Maintenance Records

- ❑ A Code compliant written Maintenance Control Program is not in place
- ❑ Maintenance program will have to be implemented
- ❑ Machine room logbooks/documentation required
- ❑ Estimated cost: Can be incorporated into a maintenance contract
- ❑ Maintenance cost may increase

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Minimum Safety Equipment

- ❑ GFCI protected outlets required in machine room, car, and pit
- ❑ Pit ladder required for elevator 2
- ❑ Equipment room signage and second emergency key box required
- ❑ Machine room temperature control system required
- ❑ Estimated cost: \$20,000.00 - \$50,000.00

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Inspections And Tests

- Monthly testing of Fireman's Service, emergency communication system required; Tests can be performed by "authorized personnel"
- Five year full load and annual no-load test of traction elevators required... "Elevator personnel" must perform these tests.
- Estimated cost: Can be included into maintenance contract - Pricing may increase

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Case Study Conclusion

- At a minimum, this project will require installation of the following equipment:
 - Door restrictors
 - Fireman's Service '87 or '04 compliant
 - GFCI outlets, pit ladder, signage and key box
 - Implementation of a Code compliant maintenance program.
 - Estimated Cost: \$120,000.00 - \$250,000.00
- The new retroactive code requirements do not require the entire installation to be brought up to current code standards, however, the cost effectiveness of upgrading obsolete equipment which has exceeded its designed useful life is a judgment call which must be made by the Owner.

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Case Study Conclusion

- In this particular case, VDA recommended consideration be given to conducting a complete modernization of the entire control system as the most cost effective solution for providing full code compliance and long term dependability for this equipment.
- Typical modernization budget for this type of elevator system would be between \$325,000.00 and \$375,000.00 plus any building code related upgrades required as a result of the elevator work.

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Inspections, Tests, Permits, Certificates of Operation



Inspections/Safety Tests To Be Conducted On Vertical Transportation Equipment

1. Periodic Test Requirements – Category 1 – Annual testing required
 - a) Annual testing for all traction elevators
 - b) Annual testing for all hydraulic elevators
 - c) Step Index Testing for all escalators
2. Periodic Test Requirements – Category 5 – Testing required every 5 years
 - a) Five year full load safety test for all traction elevators
3. Annual emergency power test, were applicable
4. Monthly fireman's service test, Phase I and II
5. Monthly emergency communication device test

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Inspection/Safety Test Check List

- Have the required tests been conducted and reports forwarded to the State?
- Do you have copies of all required safety test reports on file?
- Do you have a current Certification of Operation on file for each elevator?
- Has your elevator contractor obtained a permit for repairs/alterations conducted on your equipment?
- Do you have a copy of the permit on file along with final acceptance by the Elevator Inspector?

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Dormant Installations

- New Code requirements governing the abandonment and/or removal of existing equipment
- Existing equipment which will be out of service for extended periods of time will now be classified as temporarily dormant
- Power must be disconnected and the main line disconnect locked off and tagged by the elevator inspector
- Annual safety inspections shall continue during the temporary dormant period for a maximum of three years

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Dormant Installations (CONT.)

- Elevator equipment which has been temporarily dormant for three years shall be classified as dormant and placed out of service per ASME A17.1 2004 8.11.1.4.
- Units placed out of service must be permanently disabled and/or barricaded
- Annual safety testing will not be required on dormant equipment however, dormant equipment which is being returned to service must successfully complete all safety testing required by the local inspector

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Dormant Installations (CONT.)

- All elevator equipment being removed from a building must be removed by trained elevator personnel unless the building is being demolished
- All elevators in existing building which are being demolished must be removed from service by trained elevator personnel by lowering the car and/or counterweights to the pit
- If a hydraulic cylinder is removed as part of the building demolition, trained elevator personnel shall removed all hydraulic oil and the well hole must be sealed per MPCA requirements

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New Equipment Requirements & New Technology



New Equipment Requirements

- 2006 IBC building code requirements, as amended, inserted into new elevator code 1307
- Hoistway venting
 - Dependant on occupancy type and rise
 - Required for buildings with overnight sleeping
- Minimum cab size
 - 24" X 84" clear interior required - emergency stretcher
 - Star of life identification required
 - Typically, larger hoistway required
- Sprinklers prohibited in machine rooms, hoistways and pits

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New Equipment Requirements (CONT.)

- Pit drains
- Machine room access through bathroom prohibited
- Hoistway door unlocking devices now permitted on all floors, must be locked with key in lockbox
- Hoistway access key operation required for units operating at 30 fpm or above
- Emergency telephone – separate line required for each car. Consolidators no longer allowed
- Accessibility must comply with MN Rule 1341
 - Building floor numbering requirements 1, 2, 3 ascending -1, -2, -3 descending
 - Star of life identification required

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New Technology

- MRL's – Machine Room Less Elevators
 - Permanent magnet motors
 - Smaller
 - Traditional machine room not required
 - Less expensive
 - Unproven – Potential issues with reduced life expectancy
 - Alternate Suspension Means - Not approved in MN
 - Flat belts – Otis Gen 2
 - Kevlar ropes – ThyssenKrupp Isis
 - Only MRL's approved for installation in MN
 - Schindler, Kone, Independents (MCE, Global Tardif)

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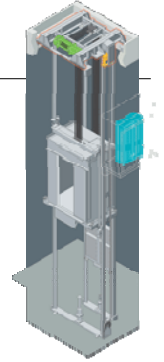


MRL's



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Gearless Hoist Motor



Typical MRL Installation

Q & A



Thank You

