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CONVEYANCE SECTION POLICY #8

Single-bottom Hydraulic Cylinder Mitigation

Effective October 1, 2011

Revised February 1, 2012 and May 13, 2013

DISCUSSION

As hydraulic elevator cylinders age they are susceptible to corrosion and leaks due to exposure to soil and water. If the hydraulic system has a catastrophic loss of fluid due to failures in the single-bottom cylinder (commonly installed prior to 1974), the elevator will fall out of control with the potential for injury and death to the riders. Therefore, the Division of Oil and Public Safety (OPS) Conveyance Regulations (7 CCR 1101-8) require owners of hydraulic elevators that have a hydraulic cylinder buried in the ground to determine if the cylinder has a single-bottom, and if so, to complete one of the following mitigation actions by January 1, 2012 with potential extension until December 31, 2013:

1. Retro-fit the elevator with car safeties (brakes), or
2. Retro-fit the hydraulic cylinder with a plunger gripper (device that stops movement of the hydraulic piston), or
3. Replace the hydraulic cylinder with one that is equipped with a safety bulkhead (double-bottom), or
4. In lieu of conducting mitigation activities as described above, the owner may cease operation of the elevator by making the elevator dormant or removing the elevator from service according to Conveyance Regulations Sections 2-10 and 2-11, respectively.

A historical summary of regulation, policy and code requirements regarding hydraulic single-bottom cylinder mitigation is as follows:

- Elevator code ASME A17.1-1971 edition - Requires all newly installed hydraulic elevators to have hydraulic cylinders with safety bulkheads.
- Elevator code ASME A17.1-2000 edition - Requires all existing hydraulic elevators to have hydraulic cylinders with safety bulkheads.
- January 1, 2008 - Elevator and Escalator Safety Act becomes effective, which adopts 2007 edition of code, and regulations promulgated in April 2008.
- January 1, 2010 - Amendment to the Conveyance Regulations requires existing single-bottom hydraulic cylinders to be mitigated by January 1, 2012. In May 2011, notification of this requirement was sent to all owners of buildings with conveyances.
- October 1, 2011 - OPS Policy #8 was developed and sent to all owners of buildings with conveyances. The policy allowed owners to request an extension up to December 31, 2013 to mitigate the hydraulic cylinder, based on budgeting constraints and only if the status of the hydraulic cylinder was verified and a mitigation plan was submitted to OPS by January 1, 2012.
- May 13, 2013 - OPS Policy #8 was revised and sent to all building owners that potentially own elevators with single-bottom hydraulic cylinders. This revision

eliminates the allowance for an extension request and requires mitigation activities to begin by December 31, 2013.

POLICY

Verification of hydraulic cylinder status

The owner of a building that has a hydraulic elevator installed prior to January 1, 1974 must verify that the hydraulic elevator does or does not have a single-bottom cylinder. The OPS will accept verification documentation such as, a County Assessors' document that states the building was built on or after January 1, 1974, documentation that the elevator was installed on or after January 1, 1974, or documentation from a conveyance contractor that mitigation of the cylinder was previously completed. The building owner may also submit other information to OPS that indicates the status of the hydraulic cylinder(s) and request that OPS make a determination as to whether mitigation of the hydraulic cylinder(s) is necessary. Submittals indicating to OPS that the elevator does not have a single-bottom cylinder are as follows:

1. A letter from an elevator contractor stating that the elevator does not have a single-bottom cylinder.
2. A page from the county assessors web page indicating that the building was erected after January 1, 1974.

Mitigation of the problem

If the verification action described above indicates that the hydraulic cylinder has a single-bottom (does not have a safety bulkhead) or if OPS determines that the documentation is not sufficient to indicate otherwise, one of the actions below must be completed:

1. **Mitigate the single-bottom cylinder by December 31, 2013** via one of the options discussed above and as listed in the [Conveyances Regulations Section 2-7(4)].
OR
2. **Cease operation of the elevator** by making the elevator dormant or removing the elevator from service according to Conveyance Regulations Sections 2-10 and 2-11, respectively.

Enforcement

If the conveyance owner has not completed mitigation actions as described above by **December 31, 2013**, a Notice of Violation (NOV) will be issued by OPS to the owner according to Article 5 of the Conveyance Regulations. This NOV will include a monetary penalty and require the owner to verify the status of the hydraulic cylinder according to the provisions listed above and submit this documentation to OPS within 30 days from the date of the NOV. If the elevator does have a single-bottom cylinder, a hydraulic pressure relief test must be immediately performed according to Conveyance Regulation Section 2-3-2(1)(a). If the test successfully passes, mitigation of the cylinder must be completed within 180 days from the date of the NOV. If the test fails, the elevator shall be removed from service immediately. Per statute and regulations, the owner will be afforded the opportunity to discuss the violation with OPS during an informal conference which will result in a Settlement Agreement that will include required mitigation actions.

If actions required in the NOV or in a Settlement Agreement are not completed, the OPS will issue an Enforcement Order to the owner that will include:

1. A monetary penalty of up to \$1,000 per day of violation; and
2. Shut-down of the elevator.