U. S. Department of Labor
Occupational Safety and Health Administration
Directorate of Science, Technology and Medicine
Office of Science and Technology Assessment

OSHA Safety Hazard Information Bulletin on Improper Support of an Elevator Car During Installation

June 22, 1995

MEMORANDUM FOR: REGIONAL ADMINISTRATORS

THROUGH: JIM ROBERTS
Acting Director
Office of Field Programs

FROM: CHARLES E. ADKINS
Director
Directorate of Technical Support

SUBJECT: **Hazard Information Bulletin**[1] - Improper Support of an Elevator Car During Installation

OSHA investigated a fatality involving an elevator car sling and platform (these are also known as platforms, car frames and platforms, car slings, car frames, safety planks) which was improperly supported during the erection and installation of a traction elevator. At the time of the incident, an employee was constructing overhead protection on top of the car sling. There was a free fall of the car sling and platform of approximately 60 feet to the bottom of the shaft resulting in the employee's death.

During the course of the investigation it was learned that proper safety procedures and equipment were not utilized. It was discovered that three other similar incidents (at different sites) had occurred where the elevator car platform dropped/fell due to improper securing when it was in an elevated position in the shaftway prior to the car being "roped" (that is, prior to the elevator car being attached to its permanent hoist ropes).

The elevator car can be assembled and then roped at either the top or the bottom of the hoistway. Diagram No. 1 (see attachment) is an illustration of a roped up governor for a car sling and platform. In some cases, including this incident, the car sling is assembled at the bottom of the hoistway and then is hoisted to the top to be roped. However, in these cases, the car must be positively supported at this level and backup systems must be used to insure that there is no support failure which results in the platform being dropped.

There are specific safety procedures and equipment which are required by the elevator construction industry to prevent this type of incident[2,3]. Those procedures and equipment are listed below:

1. The governor must be roped up and the car's safeties (e.g. "wedges" or "safety jaws" which act as rail brakes which grab the elevator's guide rails) made operational prior to hoisting the car sling. In the event of a safety failure (e.g. failure of a support sling(s)) or a drop in the platform the governor is designed to mechanically actuate the car's safeties, which are part of the car sling and platform. When the safeties engage, the car stops prior to falling to the bottom of the shaft, thus preventing a "free fall" of the car sling.

2. All employees working in the hoistway at a level greater than 6 feet above the bottom of the shaft must use fall protection consisting of a body belt/harness and lanyard connected to an independent lifeline.

3. When the car sling and platform is raised/hoisted to the top of the shaftway to be roped, it must be positively secured by setting the car's safeties ("wedges") at this elevated level. In addition, one or a combination of the following must be completed: 1) a deck or platform of sufficient strength must be built immediately below the car platform to support the platform in the event of a safety failure; 2) the car sling must be positively secured by placing bolts through the car guide rails so the "safety jaws" rest on these bolts; and 3) from the investigation one other common practice which is not referenced in the training materials is the top member of the car sling (commonly referred to as the "cross head") must be lashed to the rails and/or the division beams using at least one wire rope sling of sufficient strength per rail. To prevent deterioration of the slings, padding or other means of protection must be provided at the points where the slings contact the structural members.

In the case of this fatality, the elevator car sling and platform were assembled at the bottom of the hoistway and then raised by means of a hoist line from a temporary winch to the top of the shaftway in order to be roped. The governor was not roped prior to the car sling being hoisted to the top of the shaft. The car safeties were then apparently set by hand at this elevated level and a secondary backup 5/8" wire rope sling was used to attach the top member of the car sling, the crosshead, to one of the elevator rails and one of its rail brackets. The sling was not padded or otherwise protected at its contact points on the crosshead or the rail bracket. The hoistline from the temporary winch was disconnected to facilitate the placement of structural beams in the machine room. It has not been determined if the safeties were actually set or if they were only partially set. The wire rope sling failed due to the force imparted to it during the initial drop of the platform. Evidence showed that the wire rope sling was not cinched tight around the support members. The slack in the wire rope appears to have equated to an impact loading of the sling when the platform dropped, resulting in the failure of this secondary support.

In sum, there was a failure of the secondary system, and with the governor not roped prior to the car sling being raised there was no primary safety system in-place to prevent the car from entering into a free fall.

The safe work procedures and equipment which need to be utilized in order to work safely on elevated car platforms have been developed over the years by the elevator construction industry. The two groups which represent this industry and have documents related to this subject matter are the National Elevator Manufacturing Industry, Inc. (NEMI), also known as the National Elevator Industry, Inc. (NEII), and the National Elevator Industry Educational Program (NEIEP).

Compliance and consultation personnel should be aware that the improper support of elevator cars during construction of traction elevators can and has caused death and serious injuries. Additionally, they should be aware that the industry has specific procedures and equipment it utilizes to positively control this hazard.

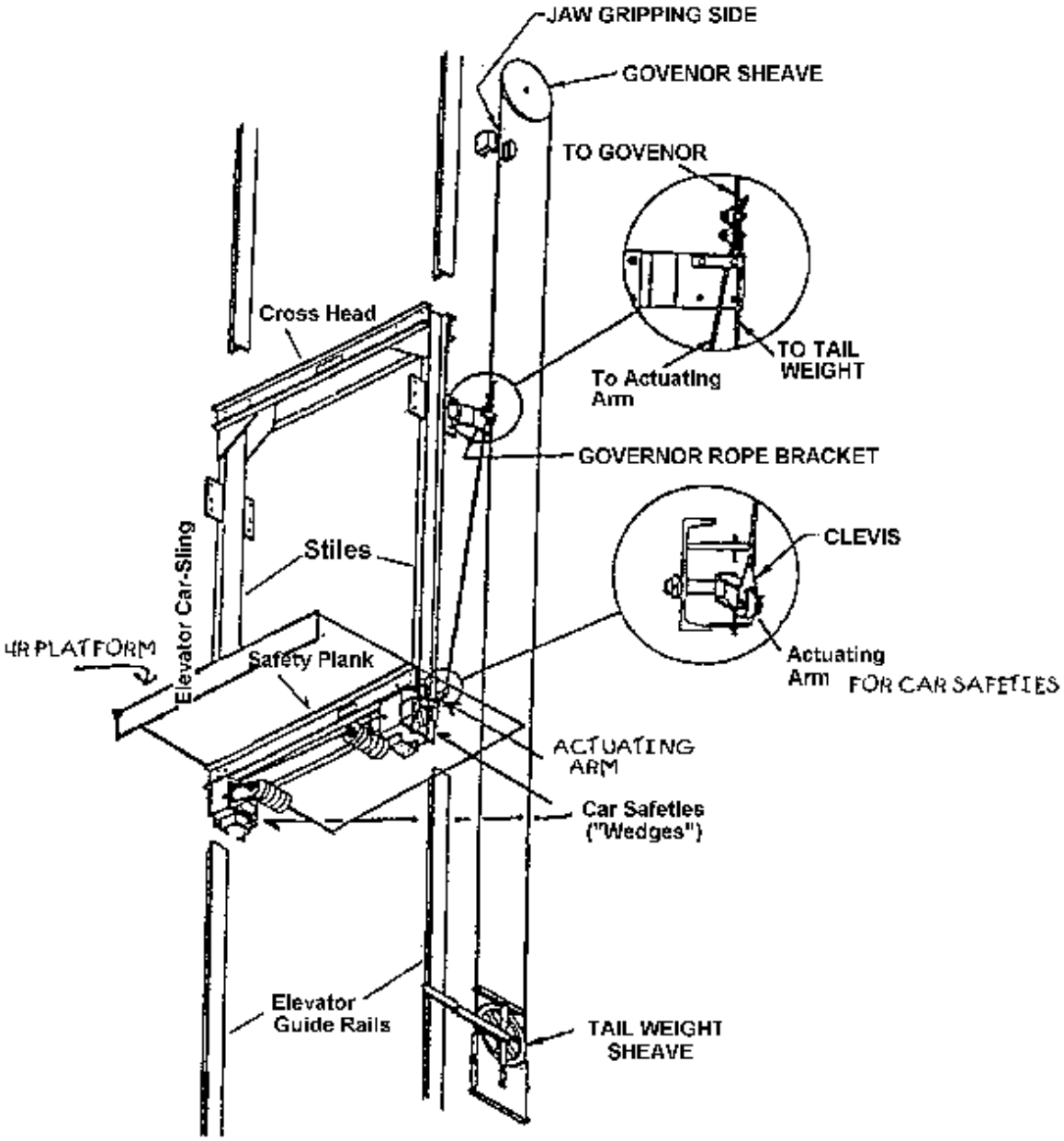
Please distribute this bulletin to all Area Offices, State Plan States, Consultation Projects and appropriate local labor and industry associations.

References

[1] The Directorate of Technical Support issues **Hazard Information Bulletins (HIBs)** in accordance with OSHA Instruction CPL 2.65 to provide relevant information regarding unrecognized or misunderstood health hazards, inadequacies of materials, devices, techniques, and safety engineering controls. HIBs are initiated based on information provided by the field staff, studies, reports and concerns expressed by safety and health professionals, employers, and the public. Information is complied based on a thorough evaluation of available facts, literature and in coordination with appropriate parties. [Back to Text]

[2] **Training Modules**. National Elevator Manufacturing Industry, Inc. (NEMI). [Back to Text]

[3] **Training Modules**. National Elevator Industry Educational Program (NEIEP). [Back to Text]



CAR SLING AND PLATFORM OF A TRACTION ELEVATOR

DIAGRAM NO. 1