Case 411. 36-year-old machine operator died when he was crushed between the platens of a 3,200 ton horizontal injection mold press.

A 36-year-old male machine operator died when he was crushed between the platens of a 3,200-ton Krauss Maffei horizontal injection mold press. An outside contractor had performed an upgrade on this machine earlier in the year. The outside contractor installed four new sensors, one on each corner on the underside of a presence-sensing floating floor; these were "plunger-type" sensors (like a ball point pen), replacing toggle-switch type sensing units at the clamp area of the machine. The sensors were designed to prohibit the press operation if 50 pounds or more of weight was placed on the floor. In addition, the control panel was upgraded to include a message to the operator that the clamp area was not clear. Under normal operation, after forming the parts, a pick and place conveyor removed the finished parts from the press area and placed them on a conveyor for further processing. In this incident, the pick and place conveyor had dropped the parts into the press area onto the floating floor. The press operator stopped the press, which was operating in automatic mode, and the molds retracted (distance between the molds was approximately 5 feet) to permit the decedent to enter the press area to retrieve the parts. The decedent entered the press, picked up the parts, and then threw them outside of the press. At this point, it appeared the press operator thought the decedent had exited the press. Unbeknownst to the operator, the decedent was still in the press area. It was hypothesized that the decedent noticed some un-formed plastic around the molds which could interfere with press function and was attempting to clear it when the operator restarted the machine. The decedent was crushed between the closing platens. The operator heard a noise and opened the press. He saw the decedent and then called for emergency response. Subsequent investigation determined that the plunger arms on all four of the recently installed sensors had broken off due to an inferior quality of the product and the design of the floor within the press; thus, the floor did not function as designed, permitting both the press door and the molds to close. The control panel did not indicate to the machine operator that the press area was not clear.

MIOSHA General Industry Safety and Health Division issued the following Serious citations to the employer at the conclusion of its investigation.

SERIOUS: PLASTIC MOLDING, GI PART 62

- RULE 408.16211(1): An employer shall provide training to an employee regarding the operating procedures, hazards, and safeguards of any assigned job.

  There was no training provided to an employee on hazards and safeguards associated with the operation of the Krauss Maffei Plastic Injector Molder in the southeast end of the North building.

- RULE 408.16211(2): An employer shall not allow a machine to be operated which is not guarded as prescribed by this part or where the machine has a known defect which could affect the safety of an employee.

  There was a defective presence-sensing floor grate on the Krauss Maffei 3200 Ton horizontal injection molding machine. The presence-sensing floor grate interlock was not

functioning, the device did not fail safe and the machine control did not indicate presence of an employee inside of the point of operation.

- RULE 408.16225(2): If a presence-sensing point of operation device is used, it shall protect the operator as provided in sub-rule (1)(a) of this rule and shall be interlocked into the control circuit to prevent or stop motion if the operator's head or other part of his or her body is within the sensing field of the device during the closing cycle of the machine. The device shall not be used to initiate operation of the machine and shall be in compliance with all of the following provisions:

(a) The device shall be constructed so that a failure within the device initiates a stopping action and prevents the initiation of a successive cycle until the failure is corrected. The failure shall be indicated by the system.
(b) The distance from the sensing field to the point of operation shall be such so as to permit the mold or die to close or stop before the employee can reach into the point of operation with ay body part.
(c) Safety guards shall be used to protect an employee from all hazardous motion which is not protected by the presence-sensing device. The protection function of a presence-sensing point of operation device may be bypassed for the purposes of parts ejection, circuit checking, and feeding as the mold or die opens if the operator is not exposed to hazardous motion.

(a. The presence-sensing floor grate interlock was not functioning on the Krauss Maffei 3200 Ton horizontal injection molding machine.
(b. The presence-sensing floor grate was not constructed to fail safe in the event of a component failure. All four of the limit switch roller plungers were sheared off.
(c. There was no indication on the machine control that the presence-sensing floor grate detected the presence of an employee inside of the point of operation on the Krauss Maffei 3200 Ton horizontal injection molding machine.

- RULE 408.16226(2): If a machine requires more than 1 operator, and if each operator is exposed to a point of operation, the controls shall be activated concurrently before the machine will operate.

There was no secondary activation device available or utilized when the Krauss Maffei 3200 Ton horizontal injection molding machine was operated in manual mode. A second employee enters the point of operation to retrieve completed parts from the mold.