

**Case 37: 32-year old male mechanic died from asphyxiation after being pinned in a rotary press.**

On July 9, 2003, a 32-year-old male mechanic died from asphyxiation after being pinned in a prototype rotary press while attempting to set up a fixture within a vacuum chamber that supports the product being made within the press. The rotary press consisted of twelve vacuum chambers affixed to a carousel, a large circular rotating table in the base of the machine. Each vacuum chamber had a square bottom plate (approximately 21-inches wide) with brackets that hold a circuit board. The upper portion of each vacuum chamber consisted of a one-inch thick aluminum box-shaped lid (approximately 21 inches wide and 13 inches tall). The underside of the lid had a plate that moves up and down within the lid and had several air holes in it to permit a vacuum to be drawn within the chamber. The lid had a sensor indicating when a circuit board was present on the bottom plate and in contact with the upper plate. The presence of the circuit board in contact with the upper plate triggered the sensor to cycle the press. The press cycle was complete when the lid rose to a point that tripped an upper limit switch. The press had an emergency stop that deactivated the motion of the carousel, but did not bleed hydraulic pressure or block the opening/closing of the lid. Running the press was a two-person operation; the victim was conducting the circuit board switchover alone. The victim was replacing a large circuit board on one of the vacuum chamber's bottom plates with a smaller one to run a different product. He had pressed the emergency stop to prohibit the carousel from rotating. To change the circuit board, the company required the plate from the lid be removed and contact paper placed over the holes from the inside to accommodate the smaller circuit board on the bottom plate. In the past, instead of removing the plate and using contact paper, the victim used the smaller circuit board, placed it against the upper plate, traced around it with a marker, and used masking tape to cover the holes on the underside of the plate. On the day of the incident, the victim placed the circuit board against the upper plate to trace the circuit board size onto the vacuum plate to measure the desired area for masking tape application. Changing the circuit boards was done only after the machine had reached a full cycle as sensed by the upper limit switch. However the press failed to complete its full cycle during the prior shut down. It was found that the press was operating on a back-up compressor that did not provide as much air pressure. This did not permit the lid to open enough to trigger the upper limit switch, indicating a completed press cycle. When the victim placed the small circuit board against the vacuum plate for measurements, the press completed the cycle it had begun before shutdown. The lid closed, trapping the head and upper torso of the victim in the press. A coworker found the victim and pressed the emergency stop button and bled the air pressure from the press. The lid could then be opened and coworkers extracted him from the press and began CPR. Emergency personnel arrived and the victim was declared dead at the scene. A safety chain designed to hold the lid in the up position was not hooked to the lid. There was also a non-operational portable emergency stop button on the floor with its cord wrapped around it. Toxicology showed he had marijuana in his blood and urine.

MIOSHA issued the following “Serious” citations to the employer:

1. The employer did not provide concurrent machine controls for each attendant employee exposed to the point of operation. There were no machine controls for the second operator at the rotary assembly machine (General Provisions, Part 1, Rule 33(4))
2. The employer did not provide a point of operation guard or device. There was no guard on the rotary assembly machine (General Provisions, Part 1, Rule 34(3))
3. The employer did not enforce lockout procedures for employee setting up rotary assembly machine and there were no machine specific procedures on the rotary assembly machine. (The Control of Hazardous Energy Sources, Part 85, Rule 1910.147c(4)(i) Adopted by rule 8502)
4. There was inadequate training of employees and the employee was not trained on machine specific procedures on the rotary assembly machine. (The Control of Hazardous Energy Sources, Part 85, Rule 1910.147c(7)(i)(a) Adopted by rule 8502)
5. The employer did not conduct periodic inspection of the energy control procedure of the rotary assembly machine (The Control of Hazardous Energy Sources, Part 85, Rule 1910.147c(6)(i) Adopted by rule 8502)