Emergency Stops – What Good are They?

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Background

★ Global Automotive Parts Manufacturing Company
- Several environmentally friendly technologies for passenger cars and commercial vehicles such as turbochargers, viscous fans and fan drives, engine timing systems and emissions technologies
- Total area of nearly 100,000 square meters
- Not in the U.S.

★ Paul Esposito, President
- STAR Consultants since 1997
- Safety through Accountability and Recognition (STAR)
- Special program and professional mentor for this company’s H&S personnel - Worldwide
Partial Finger Amputation

A compressor is loaded into a machine to fill it with oil and place it under high pressure, to check for leaks. During the test, the compressor’s fly wheel is spinning, as it would normally do. This is to keep the compressor from overheating.

The operator notices a hose coming loose, and potentially spraying the inside of the machine.

He engaged the E-Stop, opened the door to grab the hose. Quickly. Oil was going everywhere.

The fly wheel was still spinning. Grabbed the gloved hand, ripped off the tip of the finger.
Data Collection

We use as 8 D (8 Discipline) process here.

- Interim containment - ID the direct energy – created a barrier
- Causal Factors: Equipment, Materials, Tools, Environment, Procedures
- 5-Why for each causal factor – terminating at the root cause
  - RC = Management System - What system was supposed to prevent this incident or behavior?
- 90 Day Follow-up Verification
Data Collection

What did people / paper say?

- The E-Stop was more convenient than the regular stop.
- Neither the E-Stop nor the Interlock implemented a brake for the spinning flywheel.
- The interlock and E-stop both worked as designed – shut off the power to the hydraulic.
- **THE E-STOP DID NOT POWER DOWN THE FLY WHEEL**
- E-Stop and interlock are tested (PM) monthly.
- JHA addressed the energy of the hydraulics, and the energy to the moving flywheel.
- Maintenance added the safety features (E-stop and interlock) not the manufacturer.
Contributing Factors

★ Direct cause – there are three energy sources
★ Machine:
  ➢ 1) Hydraulic –
  ➢ 2) Moving Fly Wheel –
  ➢ 3) Human Access, placing hand in operational area
★ All three were accounted for in the machine design but not for the safety feature (E-stop and interlock)

★ Trigger events
★ Design: separate electrical controls for E-stop and Interlock
★ Equipment: Acceptance tested used Stop button only.
★ Risk Assessment – Job Hazard Analysis – Engineering controls – Good!
  ➢ But, only verified existence, not testing against all possibilities

★ What we still don’t know for sure?
★ Had the workers known and seen the difference between the stop button and the E-stop? And reported the difference?
Lessons Learned

★ New controls and why?
★ Existing controls (engineering) were appropriate
★ Tie in safety stops to the same electrical circuit as the regular stop.

★ Program changes / improvements and why?
★ Develop standards for after market installation of safeties
★ Training maintenance to standards
★ Risk Assessment / Equipment acceptance – test all controls WITH the operators

★ Impact on the rest of the operation / organization?
★ Nine other machines found to be the same…
Thank you

Questions?

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