

working data, test report, certification/validation report, any follow-up inspections or testing, and reports of equipment failures, any reports of accidents involving the equipment, and any other pertinent information. These records shall be available for inspection by OSHA and OSHA State Plan offices.

G. Dispute Resolution Procedures

1. The validation organization shall have a reasonable written procedure for acknowledging and processing appeals or complaints from program participants (manufacturers, producers, suppliers, vendors and employers) as well as other interested parties (employees or their representatives, safety personnel, government agencies, etc.), concerning certification or validation.

2. The validation organization may charge any complainant the reasonable charge for repeating tests needed for the resolution of disputes.

APPENDIX D TO § 1910.217—NONMANDATORY SUPPLEMENTARY INFORMATION

This appendix provides nonmandatory supplementary information and guidelines to assist in the understanding and use of 29 CFR 1910.217(h) to allow presence sensing device initiation (PSDI) of mechanical power presses. Although this appendix as such is not mandatory, it references sections and requirements which are made mandatory by other parts of the PSDI standard and appendices.

1. General

OSHA intends that PSDI continue to be prohibited where present state-of-the-art technology will not allow it to be done safely. Only *part revolution* type mechanical power presses are approved for PSDI. Similarly, only presses with a configuration such that a person's body cannot completely enter the bed area are approved for PSDI.

2. Brake and Clutch

Flexible steel band brakes do not possess a long-term reliability against structural failure as compared to other types of brakes, and therefore are not acceptable on presses used in the PSDI mode of operation.

Fast and consistent stopping times are important to safety for the PSDI mode of operation. Consistency of braking action is enhanced by high brake torque. The requirement in paragraph (h)(2)(ii) defines a high torque capability which should ensure fast and consistent stopping times.

Brake design parameters important to PSDI are high torque, low moment of inertia, low air volume (if pneumatic) mechanisms, non-interleaving engagement springs, and structural integrity which is enhanced by over-design. The requirement in paragraph (h)(2)(iii) reduces the possibility

of significantly increased stopping time if a spring breaks.

As an added precaution to the requirements in paragraph (h)(2)(iii), brake adjustment locking means should be secured. Where brake springs are externally accessible, lock nuts or other means may be provided to reduce the possibility of backing off of the compression nut which holds the springs in place.

3. Pneumatic Systems

Elevated clutch/brake air pressure results in longer stopping time. The requirement in paragraph (h)(3)(i)(C) is intended to prevent degradation in stopping speed from higher air pressure. Higher pressures may be permitted, however, to increase clutch torque to free "jammed" dies, provided positive measures are provided to prevent the higher pressure at other times.

4. Flywheels and Bearings

Lubrication of bearings is considered the single greatest deterrent to their failure. The manufacturer's recommended procedures for maintenance and inspection should be closely followed.

5. Brake Monitoring

The approval of brake monitor adjustments, as required in paragraph (h)(5)(ii), is not considered a *recertification*, and does not necessarily involve an on-site inspection by a representative of the validation organization. It is expected that the brake monitor adjustment normally could be evaluated on the basis of the effect on the safety system certification/validation documentation retained by the validation organization.

Use of a brake monitor does not eliminate the need for periodic brake inspection and maintenance to reduce the possibility of catastrophic failures.

6. Cycle Control and Control Systems

The PSDI set-up/reset means required by paragraph (h)(6)(iv) may be initiated by the actuation of a special momentary pushbutton or by the actuation of a special momentary pushbutton and the initiation of a first stroke with two hand controls.

It would normally be preferable to limit the adjustment of the time required in paragraph (h)(6)(vi) to a maximum of 15 seconds. However, where an operator must do many operations outside the press, such as lubricating, trimming, deburring, etc., a longer interval up to 30 seconds is permitted.

When a press is equipped for PSDI operation, it is recommended that the presence sensing device be active as a guarding device in other production modes. This should enhance the reliability of the device and ensure that it remains operable.

An acceptable method for interlocking supplemental guards as required by paragraph (h)(6)(xiii) would be to incorporate the supplemental guard and the PSDI presence sensing device into a hinged arrangement in which the alignment of the presence sensing device serves, in effect, as the interlock. If the supplemental guards are moved, the presence sensing device would become misaligned and the press control would be deactivated. No extra microswitches or interlocking sensors would be required.

Paragraph (h)(6)(xv) of the standard requires that the control system have provisions for an "inch" operating means; that die-setting not be done in the PSDI mode; and that production not be done in the "inch" mode. It should be noted that the sensing device would be by-passed in the "inch" mode. For that reason, the prohibitions against die-setting in the PSDI mode, and against production in the "inch" mode are cited to emphasize that "inch" operation is of reduced safety and is not compatible with PSDI or other production modes.

7. Environmental Requirements

It is the intent of paragraph (h)(7) that control components be provided with inherent design protection against operating stresses and environmental factors affecting safety and reliability.

8. Safety system

The safety system provision continues the concept of paragraph (b)(13) that the probability of two independent failures in the length of time required to make one press cycle is so remote as to be a negligible risk factor in the total array of equipment and human factors. The emphasis is on an integrated total system including all elements affecting point of operation safety.

It should be noted that this does not require redundancy for press components such as structural elements, clutch/brake mechanisms, plates, etc., for which adequate reliability may be achieved by proper design, maintenance, and inspection.

9. Safeguarding the Point of Operation

The intent of paragraph (h)(9)(iii) is to prohibit use of mirrors to "bend" a single light curtain sensing field around corners to cover more than one side of a press. This prohibition is needed to increase the reliability of the presence sensing device in initiating a stroke only when the desired work motion has been completed.

Object sensitivity describes the capability of a presence sensing device to detect an object in the sensing field, expressed as the linear measurement of the smallest interruption which can be detected at any point in the field. Minimum object sensitivity describes the largest acceptable size of the interrup-

tion in the sensing field. A minimum object sensitivity of one and one-fourth inches (31.75 mm) means that a one and one-fourth inch (31.75 mm) diameter object will be continuously detected at all locations in the sensing field.

In deriving the safety distance required in paragraph (h)(9)(v), all stopping time measurements should be made with clutch/brake air pressure regulated to the press manufacturer's recommended value for full clutch torque capability. The stopping time measurements should be made with the heaviest upper die that is planned for use in the press. If the press has a slide counterbalance system, it is important that the counterbalance be adjusted correctly for upper die weight according to the manufacturer's instructions. While the brake monitor setting is based on the stopping time it actually measures, i.e., the normal stopping time at the top of the stroke, it is important that the safety distance be computed from the longest stopping time measured at any of the indicated three downstroke stopping positions listed in the explanation of T_s . The use in the formula of twice the stopping time increase, T_m , allowed by the brake monitor for brake wear allows for greater increases in the downstroke stopping time than occur in normal stopping time at the top of the stroke.

10. Inspection and Maintenance. [Reserved]

11. Safety System Certification/Validation

Mandatory requirements for certification/validation of the PSDI safety system are provided in appendix A and appendix C to this standard. Nonmandatory supplementary information and guidelines relating to certification/validation of the PSDI safety system are provided to appendix B to this standard.

[39 FR 32502, June 27, 1974, as amended at 39 FR 41846, Dec. 23, 1974; 40 FR 3982, Jan. 27, 1975; 43 FR 49750, Oct. 24, 1978; 45 FR 8594, Feb. 8, 1980; 49 FR 18295, Apr. 30, 1984; 51 FR 34561, Sept. 29, 1986; 53 FR 8353, 8358 Mar. 14, 1988; 54 FR 24333, June 7, 1989; 61 FR 9240, Mar. 7, 1996; 69 FR 31882, June 8, 2004]

§ 1910.218 Forging machines.

(a) *General requirements*—(1) *Use of lead*. The safety requirements of this subparagraph apply to lead casts or other use of lead in the forge shop or die shop.

(i) Thermostatic control of heating elements shall be provided to maintain proper melting temperature and prevent overheating.

(ii) Fixed or permanent lead pot installations shall be exhausted.