# ANSI B11.1-2009 (R2020)

American National Standard

# Safety Requirements for Mechanical Power Presses

**ANSI-Accredited Standards Developer and Secretariat:** 



B11 Standards, Inc. POB 690905 Houston, TX 77269, USA

Approved: April 7, 2009 Reaffirmed: May 8, 2020

by the American National Standards Institute Board of Standards Review



#### **COPYRIGHT PROTECTED DOCUMENT**

Copyright © 2020 by B11 Standards, Inc.

All rights reserved. Printed in the United States of America No part of this publication may be reproduced in any form, in an electronic retrieval system or otherwise, without the prior written permission of B11 Standards, Inc

# AMERICAN NATIONAL STANDARDS

By approving this American National Standard, the ANSI Board of Standards Review confirms that the requirements for due process, consensus, balance and openness have been met by B11 Standards, Inc. (BSI) (the ANSI-accredited standards developing organization).

American National Standards are developed through a consensus process. Consensus is established when substantial agreement has been reached by directly and materially affected interests. Substantial agreement means much more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered, and that a concerted effort be made toward resolution. This process brings together volunteers and/or seeks out the views of persons who have an interest in the topic covered by this publication. While BSI administers the process and establishes procedures to promote fairness in the development of consensus, it does not write the document and it does not independently test, evaluate or verify the accuracy or completeness of any information or the soundness of any judgments contained in its standards or guidelines.

American National Standards are promulgated through ANSI for voluntary use; their existence does not in any respect preclude anyone, whether they have approved the standards or not, from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to the standards. However, users, distributors, regulatory bodies, certification agencies and others concerned may apply American National Standards as mandatory requirements in commerce and industry.

The American National Standards Institute does not develop standards and will in no circumstances give an interpretation of an American National Standard. Moreover, no person shall have the right or authority to issue an interpretation of an American National Standard in the name of the American National Standards Institute. Requests for interpretations should be addressed to the Secretariat (BSI).

BSI MAKES NO WARRANTY, EITHER EXPRESSED OR IMPLIED AS TO THE FITNESS OF MERCHANTABILITY OR ACCURACY OF THE INFORMATION CONTAINED WITHIN THIS STANDARD, AND DISCLAIMS AND MAKES NO WARRANTY THAT THE INFORMATION IN THIS DOCUMENT WILL FULFILL ANY OF YOUR PARTICULAR PURPOSES OR NEEDS. BSI disclaims liability for any personal injury, property or other damages of any nature whatsoever, whether special, indirect, consequential or compensatory, directly or indirectly resulting from the publication, use of, application or reliance on this document. BSI does not undertake to guarantee the performance of any individual supplier or seller's products or services by virtue of this standard or guide, nor does it take any position with respect to the validity of any patent rights asserted in connection with the items which are mentioned in or are the subject of this document, and BSI disclaims liability for the infringement of any patent resulting from the use of or reliance on this document. Users of this document are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, is entirely their own responsibility.

In publishing or making this document available, BSI is not undertaking to render professional or other services for or on behalf of any person or entity, nor is BSI undertaking to perform any duty owed by any person or entity to someone else. Anyone using this document should rely on his or her own independent judgment, or as appropriate, seek the advice of a competent professional in determining the exercise of reasonable care in any given circumstances.

BSI has no power, nor does it undertake to police or enforce conformance to the requirements of this document. BSI does not certify, test or inspect products, designs, or installations for safety or health purposes. Any certification or other statement of conformance to any health or safety-related information in this document shall not be attributable to BSI and is solely the responsibility of the certifier or maker of the statement.

NOTICE: This American National Standard may be revised or withdrawn at any time. The procedures of the American National Standards Institute require that action be taken periodically to reaffirm, revise, or withdraw this standard. You may contact the Secretariat for current status information on this, or other B11 standards. Individuals interested in obtaining up-to-date information on standards can access this information at http://www.nssn.org (or by contacting ANSI). NSSN - A National Resource for Global Standards, provides a central point to search for standards information from worldwide sources and can connect those who seek standards to those who supply them.

Published by: B11 Standards, Inc. POB 690905, Houston, TX, 77269 USA Copyright © 2030 by B11 Standards, Inc. All rights reserved. Printed in the United States of America

No part of this publication may be reproduced in any form, in an electronic retrieval system or otherwise, without the prior written permission of the publisher.

FOREWORD   4     (THIS FOREWORD IS NOT PART OF THE REQUIREMENTS OF AMERICAN NATIONAL STANDARD B11.1–2009)   4     EXPLANATION OF THE FORMAT, AND ANSI B11 CONVENTIONS   7     INTRODUCTION   8     1   SCOPE   10     1.1   INCLUSIONS   10     1.2   EXCLUSIONS   10     2   NORMATIVE REFERENCES   13     2.1   INFORMATIVE REFERENCES   13     3   DEFINITIONS   15     4   RESPONSIBILITY   28     4.1   SUPPLIER   29     4.3   PIRSONNEL   30     5   HAZARD CONTROL   31     5.1   TASK AND HAZARD DENTIFICATION   31     5.2   RISK ASSESSMENT / RISK REDUCTION   32     6   DESIGN AND CONSTRUCTION   34     6.1.1   General requirements   34     6.1.2   Hazards associated with broken or falling components   34     6.1.4   Gauges   35     6.1.5   Stored energy   35     6.1.6   Instruct REFERENCES   34     6.1.7   GENERAL REQUIREM	CONTENTSPAGE		
(THIS FOREWORD IS NOT PART OF THE REQUIREMENTS OF AMERICAN NATIONAL STANDARD B11.1-2009)   4     EXPLANATION OF THE FORMAT, AND ANSI B11 CONVENTIONS   7     INTRODUCTION   8     1 SCOPE   10     1.1 INCLUSIONS   10     2 NORMATIVE REFERENCES   13     3 DEFINITIONS   15     4 RESPONSIBILITY   28     4.1 SUPPLIER   28     4.1 SUPPLIER   30     5 HAZARD CONTROL   31     5.1 TASK AND IDZARD DENTIFICATION   31     5.2 RISK ASSESSMENT / RISK REDUCTION   34     6.1 GENERAL REQUIREMENTS – ALL MACHINES   34     6.1.1 Hazards associated with moving parts (other than point-of-operation hazards)   34     6.1.2 ELECTRICAL REQUIREMENTS – ALL MACHINES   34     6.1.3 Brakes – general requirements   34     6.1.4 Gauges   35     6.2.2 General requirements   34     6.1.3 Brakes – general requirements   36     6.2.4 Motor-start buttons   36     6.2.5 Voltage   34     6.2.6 Grounds   36     6.2.7 External and line interferences   36     6.3 PRESESE USING FULL-REVOLUTION CLUTCHES	FOREWORD	4	
EXPLANATION OF THE FORMAT, AND ANSI B11 CONVENTIONS.   7     INTRODUCTION.   8     1 SCOPE   10     1.1 INCLUSIONS.   10     1.2 EXCLUSIONS.   10     1.2 EXCLUSIONS.   10     2 NORMATIVE REFERENCES.   13     3 DEFINITIONS   15     4 RESPONSIBILITY   28     4.1 SUPPLIER   29     4.2 USER   29     4.3 PERSONNEL   30     5 HAZARD CONTROL   31     5.1 TASK AND HAZARD IDENTIFICATION.   31     5.2 RISK ASSESSMENT / RISK REDUCTION   32     6 DESIGN AND CONSTRUCTION.   34     6.1.1 GENERAL REQUIEMENTS – ALL MACHINES   34     6.1.2 GADERAL REQUIEMENTS – ALL MACHINES   34     6.1.3 Brake's general requirements for stop functions, circuits and actuators.   36     6.1.2 HAZARD denor Struction   35     6.1.3 Brake's general requirements for stop functions, circuits and actuators.   36     6.1.4 Gauges   34     6.1.5 Stored energy.   35     6.2.1 Disconnect switch.   36     6.2.2 General requirements for stop functions, circuits and actuators.   36 <t< th=""><th>(THIS FOREWORD IS NOT PART OF THE REQUIREMENTS OF AMERICAN NATION STANDARD B11.1–2009)</th><th>NAL 4</th></t<>	(THIS FOREWORD IS NOT PART OF THE REQUIREMENTS OF AMERICAN NATION STANDARD B11.1–2009)	NAL 4	
INTRODUCTION   8     1 SCOPE   10     1.1 INCLUSIONS   10     1.2 EXCLUSIONS   10     2 NORMATIVE REFERENCES   13     2.1 INFORMATIVE REFERENCES   13     3 DEFINITIONS   15     4 RESPONSIBILITY   28     4.1 SUPPLIER   28     4.2 USER   29     4.3 PERSONNEL   30     5 HAZARD CONTROL   31     5.1 TASK AND HAZARD IDENTIFICATION   31     5.2 RISK ASSESSMENT / RISK REDUCTION   32     6 DESIGN AND CONSTRUCTION   32     6 LI GENERAL REQUIREMENTS - ALL MACHINES   34     6.1.1 GENERAL REQUIREMENTS - ALL MACHINES   34     6.1.2 Haards associated with moving parts (other than point-of-operation hazards)   34     6.1.3 Brakes - general requirements   35     6.2.4 Motor-starter.   36     6.2.3 Motor-starter.   36     6.2.4 Motor-starter.   41     6.3.7 External and line interferences   41     6.3.8 Organization of the starter.   36     6.2.4 Motor-starter.   41     6.3.7 External and line interferences   41	EXPLANATION OF THE FORMAT, AND ANSI B11 CONVENTIONS	7	
1   SCOPE	INTRODUCTION	8	
1.1   INCLUSIONS.   10     1.2   EXCLUSIONS.   10     2   NORMATIVE REFERENCES.   13     3.1   INFORMATIVE REFERENCES.   13     3.2   INFORMATIVE REFERENCES.   13     3.3   DEFINITIONS.   15     4   RESPONSIBILITY   28     4.1   SUPPLIER   28     4.2   USER   29     4.3   PERSONNEL   30     5   HAZARD CONTROL   31     5.1   TASK AND HAZARD IDENTIFICATION.   31     5.2   RISK ASSESSMENT / RISK REDUCTION   32     6   DESIGN AND CONSTRUCTION.   34     6.1.1   Hazards associated with moving parts (other than point-of-operation hazards)   34     6.1.3   Brakes - general requirements   34     6.1.4   Gauges   35     6.2.1   Hazards associated with broken or falling components   34     6.1.3   Brakes - general requirements for stop functions, circuits and actuators.   36     6.2.1   Disconnect switch.   35     6.2.2   General requirements for stop functions, circuits and actua	1 SCOPE		
1.2   EXCLUSIONS   10     2   NORMATIVE REFERENCES   13     2.1   INFORMATIVE REFERENCES   13     3   DEFINITIONS   15     4   RESPONSIBILITY   28     4.1   SUPPLER   28     4.1   SUPPLER   29     4.3   PERSONNEL   30     5   HAZARD CONTROL   31     5.1   TASK AND HAZARD IDENTIFICATION   31     5.2   RISK ASSESSMENT / RISK REDUCTION   32     6   DESIGN AND CONSTRUCTION   34     6.1   GENERAL REQUIREMENTS – ALL MACHINES   34     6.1.2   Hazards associated with broing parts (other than point-of-operation hazards)   34     6.1.3   Brakes – general requirements   34     6.1.4   Gauges   35     6.1.5   Stored energy   35     6.2.2   General requirements for stop functions, circuits and actuators   36     6.2.3   Motor-starter   41     6.2.4   Motor-starter   41     6.3.1   Single-cycle capability   42     6.3.2   Spring	1.1 INCLUSIONS		
2   NORMATIVE REFERENCES   13     2.1   INFORMATIVE REFERENCES   13     3   DEFINITIONS   15     4   RESPONSIBILITY   28     4.1   SUPPLIER   28     4.1   SUPPLIER   28     4.1   SUPPLIER   28     4.2   USER   30     5   HAZARD CONTROL   31     5.1   TASK AND HAZARD IDENTIFICATION   31     5.2   RISK ASSESSMENT / RISK REDUCTION   32     6   DESIGN AND CONSTRUCTION   34     6.1.1   GENERAL REQUIREMENTS – ALL MACHINES   34     6.1.2   Hazards associated with moving parts (other than point-of-operation hazards)   34     6.1.3   Brakes – general requirements   34     6.1.4   Gauges   35   35     6.1.5   Stored energy   35     6.2   ELECTRICAL REQUIREMENTS   36     6.2.3   Motor-starter   41     6.2.4   Motor-starter   41     6.2.5   Voltage   41     6.2.6   Counds   41	1.2 EXCLUSIONS	10	
2.1   INFORMATIVE REFERENCES.   13     3   DEFINITIONS.   15     4   RESPONSIBILITY   28     4.1   SUPPLIER   28     4.2   USER   29     4.3   PERSONNEL   30     5   HAZARD CONTROL   31     5.1   TASK AND HAZARD IDENTIFICATION   31     5.2   RISK ASSESSMENT / RISK REDUCTION   32     6   DESIGN AND CONSTRUCTION   34     6.1   GENERAL REQUIREMENTS – ALL MACHINES   34     6.1.1   Hazards associated with moving parts (other than point-of-operation hazards)   34     6.1.2   Hazards associated with moving parts (other than point-of-operation hazards)   34     6.1.3   Brakes – general requirements   34     6.1.4   Gauges   35     6.1.5   Stored energy   35     6.2   General requirements for stop functions, circuits and actuators   36     6.2.1   Disconnect switch   36     6.2.3   Motor-starter   41     6.2.4   Motor-starter   41     6.2.5   Voltage   41 <	2 NORMATIVE REFERENCES		
21   INFORMATIVE REFERENCES   15     3   DEFINITIONS   15     4   RESPONSIBILITY   28     4.1   SUPPLIER   28     4.2   USER   29     4.3   PERSONNEL   30     5   HAZARD CONTROL   31     5.1   TASK AND HAZARD IDENTIFICATION   31     5.2   RISK ASSESSMENT / RISK REDUCTION   32     6   DESIGN AND CONSTRUCTION   32     6.1   GENERAL REQUIREMENTS – ALL MACHINES   34     6.1.1   Hazards associated with moving parts (other than point-of-operation hazards)   34     6.1.2   Hazards associated with moving parts (other than point-of-operation hazards)   34     6.1.3   Brakes – general requirements   34     6.1.4   Gauges   35     6.1.5   Stored energy   35     6.2   General requirements for stop functions, circuits and actuators   36     6.2.1   Disconnect switch   36     6.2.3   Motor-starter   41     6.2.4   Motor-starter   41     6.2.5   Voltage   41 <td>2.1 INFORMATIVE REFERENCES</td> <td>13</td>	2.1 INFORMATIVE REFERENCES	13	
3   DEFINITIONS   15     4   RESPONSIBILITY   28     4.1   SUPPLIER   29     4.3   PERSONNEL   30     5   HAZARD CONTROL   31     5.1   TASK AND HAZARD IDENTIFICATION   31     5.2   RISK ASSESSMENT / RISK REDUCTION   32     6   DESIGN AND CONSTRUCTION   34     6.1   GENERAL REQUIREMENTS – ALL MACHINES   34     6.1.1   Hazards associated with moving parts (other than point-of-operation hazards)   34     6.1.2   Hazards associated with moving parts (other than point-of-operation hazards)   34     6.1.3   Brakes – general requirements   34     6.1.4   Gauges   35     6.2.5   Stored energy   35     6.2.1   Disconnect switch   36     6.2.3   Motor-starter   41     6.2.4   Motor-starter   41     6.2.5   Voltage   41     6.2.6   Grounds   41     6.3.1   Single-cycle capability   42     6.3.3   Trip mechanism   42     6.3.4	2.1 INFORMATIVE REFERENCES	13	
4   RESPONSIBILITY   28     4.1   SUPPLIER   28     4.2   USER   29     4.3   PERSONNEL   30     5   HAZARD CONTROL   31     5.1   TASK AND HAZARD IDENTIFICATION   31     5.2   RISK ASSESSMENT / RISK REDUCTION   32     6   DESIGN AND CONSTRUCTION   34     6.1   GENERAL REQUIREMENTS – ALL MACHINES   34     6.1.1   Hazards associated with moving parts (other than point-of-operation hazards)   34     6.1.2   Hazards associated with broken or falling components   34     6.1.3   Brakes – general requirements   34     6.1.4   Gauges   35     6.2.1   Disconnect switch   35     6.2.2   General requirements for stop functions, circuits and actuators   36     6.2.3   Motor-starter   41     6.2.4   Motor-starter   41     6.2.5   Voltage   41     6.3.4   Single-cycle capability   42     6.3.3   Trip mechanism   42     6.3.4   Trip mechanism   42	3 DEFINITIONS	15	
4.1   SUPPLIER   28     4.2   USER   29     4.3   PERSONNEL   30     5   HAZARD CONTROL   31     5.1   TASK AND HAZARD IDENTIFICATION   31     5.2   RISK ASSESSMENT / RISK REDUCTION   32     6   DESIGN AND CONSTRUCTION   34     6.1   GENERAL REQUIREMENTS – ALL MACHINES   34     6.1.1   Hazards associated with moving parts (other than point-of-operation hazards)   34     6.1.2   Hazards associated with broken or falling components   34     6.1.3   Braks <sup>-</sup> general requirements   35     6.1.4   Gauges   35     6.2   ELECTRICAL REQUIREMENTS   35     6.2.1   Disconnect switch   36     6.2.2   General requirements for stop functions, circuits and actuators   36     6.2.3   Motor-start buttons   40     6.3   PESSES USING FULL-REVOLUTION CLUTCHES   41     6.3.7   Trip mechanism   42     6.3.3   Trip mechanism   42     6.3.4   Trip -control system   43     6.3.5   Turnover baro	4 RESPONSIBILITY		
4.2   USER	4.1 SUPPLIER	28	
4.3   PERSONNEL   30     5   HAZARD CONTROL   31     5.1   TASK AND HAZARD IDENTIFICATION   31     5.2   RISK ASSESSMENT/ RISK REDUCTION   32     6   DESIGN AND CONSTRUCTION   32     6   DESIGN AND CONSTRUCTION   34     6.1.1   Hazards associated with moving parts (other than point-of-operation hazards)   34     6.1.2   Hazards associated with broken or falling components   34     6.1.3   Brakes – general requirements   34     6.1.4   Gauges   35     6.2   ELECTRICAL REQUIREMENTS   35     6.2.1   Disconnect switch   36     6.2.2   General requirements for stop functions, circuits and actuators   36     6.2.3   Motor-start buttons   40     6.2.4   Motor-start energe   41     6.2.5   Voltage   41     6.2.6   Grounds   41     6.2.7   External and line interferences   41     6.3.1   Single-cycle capability   42     6.3.3   Trip mechanism   42     6.3.4   Trip mechanism	4.2 USER		
5   HAZARD CONTROL   31     5.1   TASK AND HAZARD IDENTIFICATION   31     5.2   RISK ASSESSMENT / RISK REDUCTION   32     6   DESIGN AND CONSTRUCTION   34     6.1   GENERAL REQUIREMENTS – ALL MACHINES   34     6.1.1   Hazards associated with moving parts (other than point-of-operation hazards)   34     6.1.2   Hazards associated with broken or falling components   34     6.1.3   Brakes – general requirements   34     6.1.4   Gauges   35     6.1.5   Stored energy   35     6.2   ELECTRICAL REQUIREMENTS   36     6.2.2   General requirements for stop functions, circuits and actuators   36     6.2.3   Motor-start buttons   40     6.2.4   Motor-start buttons   41     6.2.5   Voltage   41     6.2.6   Grounds   41     6.3.1   Single-cycle capability   42     6.3.2   Springs   42     6.3.3   Trip mechanism   42     6.3.4   Trip-control system   43     6.3.5   Turnover bar operat	4.3 PERSONNEL	30	
5.1   TASK AND HAZARD IDENTIFICATION.   31     5.2   RISK ASSESSMENT / RISK REDUCTION   32     6   DESIGN AND CONSTRUCTION.   34     6.1   GENERAL REQUIREMENTS – ALL MACHINES   34     6.1.1   Hazards associated with moving parts (other than point-of-operation hazards)   34     6.1.2   Hazards associated with moken or falling components   34     6.1.3   Brakes – general requirements   34     6.1.4   Gauges   35     6.1.5   Stored energy   35     6.1.6   Disconect switch   36     6.2.2   General requirements for stop functions, circuits and actuators   36     6.2.3   Motor-start buttons   40     6.2.4   Motor-start er   41     6.2.5   Voltage   41     6.2.6   Grounds   41     6.3.1   Single-cycle capability   42     6.3.2   Springs   42     6.3.3   Trip ecchanism   42     6.3.4   Trip-control system   43     6.3.5   Turnover bar operation   49     6.4.1   Removal of engag	5 HAZARD CONTROL		
5.1   RISK ASSESSMENT / RISK REDUCTION   32     6   DESIGN AND CONSTRUCTION   34     6.1   GENERAL REQUIREMENTS – ALL MACHINES   34     6.1.1   Hazards associated with moving parts (other than point-of-operation hazards)   34     6.1.2   Hazards associated with broken or falling components   34     6.1.3   Brakes – general requirements   34     6.1.4   Gauges   35     6.1.5   Stored energy   35     6.1.6   General requirements for stop functions, circuits and actuators   36     6.2.1   Disconnect switch   36     6.2.3   Motor-start buttons   40     6.2.4   Motor-start buttons   40     6.2.5   Voltage   41     6.2.6   Grounds   41     6.2.7   External and line interferences   41     6.2.8   Yoltage   41     6.2.9   Voltage   41     6.2.1   Disconnet switch   32     6.2.2   General requirements for stop functions, circuits and actuators   40     6.2.4   Motor-starter   41     6.2.5 <td>5.1 TASK AND HAZARD IDENTIFICATION</td> <td>31</td>	5.1 TASK AND HAZARD IDENTIFICATION	31	
6   DESIGN AND CONSTRUCTION	5.2 RISK ASSESSMENT / RISK REDUCTION		
6.1   GENERAL REQUIREMENTS – ALL MACHINES   34     6.1.1   Hazards associated with moving parts (other than point-of-operation hazards)   34     6.1.2   Hazards associated with broken or falling components   34     6.1.3   Brakes – general requirements   34     6.1.4   Gauges   35     6.1.5   Stored energy   35     6.1.6   Disconnect switch   36     6.2.2   General requirements for stop functions, circuits and actuators   36     6.2.3   Motor-start buttons   40     6.2.4   Motor-starter   41     6.2.5   Voltage   41     6.2.6   Grounds   41     6.2.7   External and line interferences   41     6.2.8   Voltage   41     6.2.9   Voltage   41     6.2.1   Bresses USING FULL-REVOLUTION CLUTCHES   41     6.3   Springs   42     6.3.3   Trip mechanism   42     6.3.4   Trip-control system   43     6.3.5   Turnover bar operation   49     6.4.1   Removal of engaging force	6 DESIGN AND CONSTRUCTION		
6.1   GENERAL REQUREMENTS - ALL MACHINES   34     6.1.1   Hazards associated with moving parts (other than point-of-operation hazards)   34     6.1.2   Hazards associated with broken or falling components   34     6.1.3   Brakes - general requirements   34     6.1.4   Gauges   35     6.1.5   Stored energy   35     6.2   ELECTRICAL REQUIREMENTS   36     6.2.1   Disconnect switch   36     6.2.2   General requirements for stop functions, circuits and actuators   36     6.2.3   Motor-start buttons   40     6.2.4   Motor-starter   41     6.2.5   Voltage   41     6.2.6   Grounds   41     6.2.7   External and line interferences   41     6.2.8   Voltage   41     6.2.9   Voltage   41     6.3   PRESSES USING FULL-REVOLUTION CLUTCHES   41     6.3.1   Single-cycle capability   42     6.3.2   Springs   42     6.3.3   Trip mechanism   42     6.3.4   Trip-control system <td< td=""><td>6.1 CENERAL REQUIREMENTS ALL MACHINES</td><td>24</td></td<>	6.1 CENERAL REQUIREMENTS ALL MACHINES	24	
6.1.1Hazards associated with broken or falling components346.1.2Hazards associated with broken or falling components346.1.3Brakes – general requirements346.1.4Gauges356.1.5Stored energy356.2ELECTRICAL REQUIREMENTS356.2.1Disconnect switch366.2.2General requirements for stop functions, circuits and actuators366.2.3Motor-start buttons406.2.4Motor-start buttons406.2.5Voltage416.2.6Grounds416.2.7External and line interferences416.3PRESSES USING FULL-REVOLUTION CLUTCHES416.3.1Single-cycle capability426.3.2Springs426.3.3Trip-control system436.3.4Trip-control system436.3.5Turnover bar operation496.4.1Removal of engaging force506.4.2Cycle control system50	6.1 GENERAL REQUIREMENTS – ALL MACHINES		
6.1.3Brakes - general requirements346.1.4Gauges356.1.5Stored energy356.2ELECTRICAL REQUIREMENTS366.2.1Disconnect switch366.2.2General requirements for stop functions, circuits and actuators366.2.3Motor-start buttons406.2.4Motor-starter416.2.5Voltage416.2.6Grounds416.2.7External and line interferences416.3PRESSES USING FULL-REVOLUTION CLUTCHES416.3.1Single-cycle capability426.3.2Springs426.3.3Trip mechanism426.3.4Trip-control system436.3.5Turnover bar operation496.4.1Removal of engaging force506.4.2Cycle control system50	6.1.2 Hazards associated with broken or falling components	34	
6.1.4   Gauges   35     6.1.5   Stored energy   35     6.2   ELECTRICAL REQUIREMENTS   36     6.2.1   Disconnect switch   36     6.2.2   General requirements for stop functions, circuits and actuators   36     6.2.3   Motor-start buttons   40     6.2.4   Motor-starter   41     6.2.5   Voltage   41     6.2.6   Grounds   41     6.2.7   External and line interferences   41     6.2.8   PRESSES USING FULL-REVOLUTION CLUTCHES   41     6.3.1   Single-cycle capability   42     6.3.2   Springs   42     6.3.3   Trip mechanism   42     6.3.4   Trip-control system   43     6.3.5   Turnover bar operation   49     6.4.1   Removal of engaging force   50     6.4.2   Cycle control system   50	6.1.3 Brakes – general requirements		
6.1.5Stored energy356.2ELECTRICAL REQUIREMENTS356.2.1Disconnect switch366.2.2General requirements for stop functions, circuits and actuators366.2.3Motor-start buttons406.2.4Motor-starter416.2.5Voltage416.2.6Grounds416.2.7External and line interferences416.2.7External and line interferences416.3PRESSES USING FULL-REVOLUTION CLUTCHES416.3.1Single-cycle capability426.3.2Springs426.3.3Trip mechanism426.3.4Trip-control system436.3.5Turnover bar operation496.4PRESSES USING PART-REVOLUTION CLUTCHES or DIRECT DRIVE SYSTEMS496.4.1Removal of engaging force506.4.2Cycle control system50	6.1.4 Gauges		
6.2ELECTRICAL REQUIREMENTS.356.2.1Disconnect switch366.2.2General requirements for stop functions, circuits and actuators.366.2.3Motor-start buttons406.2.4Motor-starter.416.2.5Voltage.416.2.6Grounds416.2.7External and line interferences.416.3PRESSES USING FULL-REVOLUTION CLUTCHES416.3.1Single-cycle capability426.3.2Springs.426.3.3Trip mechanism426.3.4Trip-control system436.3.5Turnover bar operation496.4PRESSES USING PART-REVOLUTION CLUTCHES OR DIRECT DRIVE SYSTEMS.496.4.1Removal of engaging force506.4.2Cycle control system50	6.1.5 Stored energy		
6.2.1Disconnect switch366.2.2General requirements for stop functions, circuits and actuators366.2.3Motor-start buttons406.2.4Motor-starter416.2.5Voltage.416.2.6Grounds416.2.7External and line interferences416.2.8PRESSES USING FULL-REVOLUTION CLUTCHES416.3PRESSES USING FULL-REVOLUTION CLUTCHES416.3.1Single-cycle capability426.3.2Springs426.3.3Trip mechanism426.3.4Trip-control system436.3.5Turnover bar operation496.4PRESSES USING PART-REVOLUTION CLUTCHES OR DIRECT DRIVE SYSTEMS496.4.1Removal of engaging force506.4.2Cycle control system50	6.2 ELECTRICAL REQUIREMENTS	35	
6.2.2General requirements for stop functions, circuits and actuators	6.2.1 Disconnect switch		
6.2.3Motor-start buttons406.2.4Motor-starter416.2.5Voltage416.2.6Grounds416.2.7External and line interferences416.3PRESSES USING FULL-REVOLUTION CLUTCHES416.3.1Single-cycle capability426.3.2Springs426.3.3Trip mechanism426.3.4Trip-control system436.3.5Turnover bar operation496.4PRESSES USING PART-REVOLUTION CLUTCHES OR DIRECT DRIVE SYSTEMS496.4.1Removal of engaging force506.4.2Cycle control system50	6.2.2 General requirements for stop functions, circuits and actuators		
0.2.4Motor-starter	6.2.3 Motor-start buttons		
6.2.5Foldage	6.2.4 Molor-starter	,41 41	
6.2.7External and line interferences416.3PRESSES USING FULL-REVOLUTION CLUTCHES416.3.1Single-cycle capability426.3.2Springs426.3.3Trip mechanism426.3.4Trip-control system436.3.5Turnover bar operation496.4PRESSES USING PART-REVOLUTION CLUTCHES OR DIRECT DRIVE SYSTEMS496.4.1Removal of engaging force506.4.2Cycle control system50	6.2.6 Grounds		
6.3PRESSES USING FULL-REVOLUTION CLUTCHES416.3.1Single-cycle capability426.3.2Springs426.3.3Trip mechanism426.3.4Trip-control system436.3.5Turnover bar operation496.4PRESSES USING PART-REVOLUTION CLUTCHES OR DIRECT DRIVE SYSTEMS496.4.1Removal of engaging force506.4.2Cycle control system50	6.2.7 External and line interferences		
6.3.1Single-cycle capability426.3.2Springs426.3.3Trip mechanism426.3.4Trip-control system436.3.5Turnover bar operation496.4PRESSES USING PART-REVOLUTION CLUTCHES OR DIRECT DRIVE SYSTEMS496.4.1Removal of engaging force506.4.2Cycle control system50	6.3 PRESSES USING FULL–REVOLUTION CLUTCHES	41	
6.3.2Springs426.3.3Trip mechanism426.3.4Trip-control system436.3.5Turnover bar operation496.4PRESSES USING PART-REVOLUTION CLUTCHES OR DIRECT DRIVE SYSTEMS496.4.1Removal of engaging force506.4.2Cycle control system50	6.3.1 Single–cycle capability		
6.3.3Trip mechanism426.3.4Trip-control system436.3.5Turnover bar operation496.4PRESSES USING PART-REVOLUTION CLUTCHES OR DIRECT DRIVE SYSTEMS496.4.1Removal of engaging force506.4.2Cycle control system50	6.3.2 Springs		
6.3.41rip-control system436.3.5Turnover bar operation496.4PRESSES USING PART-REVOLUTION CLUTCHES OR DIRECT DRIVE SYSTEMS496.4.1Removal of engaging force506.4.2Cycle control system50	6.3.3 Trip mechanism		
0.5.5   Turnover bar operation   49     6.4   PRESSES USING PART-REVOLUTION CLUTCHES OR DIRECT DRIVE SYSTEMS   49     6.4.1   Removal of engaging force   50     6.4.2   Cycle control system   50	6.3.4 Trip-control system		
6.4.1   Removal of engaging force   50     6.4.2   Cycle control system   50	0.5.5 IURNOVER DAR OPERATION CLUTCHES OF DIDECT DRIVE SVOTEMS		
6.4.2 Cycle control system	6.4.1 Removal of engaging force	49 50	
	6.4.2 Cycle control system		

<i>(</i> )		50
0.4.	.3 Operating modes	
0.4.	4 Clutch/brake controls	01
6.5	MOTORIZED SLIDE ADJUSTMENT	63
6.6	SLIDE COUNTERBALANCE SYSTEMS	63
6.7	AIR-CONTROLLING EQUIPMENT	64
6.8	PRESSURE VESSELS	64
6.9	HYDRAULIC EQUIPMENT	64
6.10	FLUID-POWERED DIE-CLAMPING SYSTEM	64
6.1	0.1 Capability	64
6.1	0.2 Fluid–supply failure	65
6.1	0.3 Loss of clamping capability	65
6.11	PERFORMANCE OF SAFETY-RELATED FUNCTION	65
6.1	1.1 Ladder diagram	65
6.12	STOPPING–PERFORMANCE MONITOR	66
6.13	SAFETY BLOCKS, SLIDE LOCKS OR OTHER DIE / SLIDE SUPPORT MEANS	67
6.1.	3.1 Safety Block(s) (static load rated)	67
6.1.	3.2 Slide Lock(s)	67
6.14	MOVING BOLSTERS	69
6.1	4.1 Motion control circuits	69
6.1	4.2 Audible or visual warnings	70
6.1	4.3 Manual control of bolsters	70
6.15	SCRAP CHUTES	70
6.1.	5.1 Scrap Chute Cover(s)	70
7 T A	VOLIT INSTALLATION TESTING AND STADT UDEOD THE DDESS SVSTEM	71
I LA	(1001, INSTALLATION, TESTING AND START-OF FOR THE TRESS STSTEM	/ 1
7.1	GENERAL	71
7.1.	.1 Lockout/Tagout	71
7.2	LAYOUT	72
7.2.	.1 Production operations	72
7.2.	.2 Set-up and maintenance	72
7.3	INSTALLATION	72
7.3.	.1 Foundation	72
7.3.	2 Lifting of machine components	72
7.3.	3 Anchoring	72
7.4	TESTING AND START-UP FOR PRESS SYSTEM	72
74	1 Procedures	72
7.4	2 Assigned personnel	72
74	3 Safeguarding	73
74	4 Testing set-up and inspection for slide lock systems	73
7.4	5 Inspection of safety block circuits	73
7.7.		/5
8 SA	FEGUARDING	73
8.1	HAZARDS ASSOCIATED WITH PRESS PRODUC-TION SYSTEMS OTHER THAN POINT-OF-OPERATION	ΟN
0.1	73	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
82	HAZARDS ASSOCIATED WITH BROKEN OR FALLING COMPONENTS	75
0.2 9.2	DEDIMETED SAEECUADDING	75
0.J Q 1	I ENIMETER SAFEOUARDINO DOINT OF ODEDATION SAFECUADDING	נו דד
0.4 0.5	PUINT-OF-OPEKATION SAFEGUARDING	//
0.3	UUAKDS	/ð
ð.J.	<i>Design, construction, application, aajusiment</i>	/ð
8.3.	<i>Die enclosure guaras</i>	/8
8.5.	5 Fixea barrier guards	/9
8.5.	.4 Adjustable barrier guards	/9
8.5.	.5 Interlocked barrier guards	79
8.5.	.6 Partial enclosure	81
8.6	SAFEGUARDING DEVICES	81

#### AMERICAN NATIONAL STANDARD

	8.6.1	Point-of-operation	81
	8.6.3	Presence-sensing safeguarding device	
	8.6.4	Pull-back device	
	8.6.5	Restraint device (holdout)	
	8.6.6	Movable barrier device	91
	8.7 SA	FE–OPENING SAFEGUARDING	93
	8.8 PEI	RFORMANCE OF THE SAFETY–RELATED FUNCTION(S)	93
9	SET-U	P, OPERATION AND MAINTENANCE	94
	91 PR(	OCEDURES	94
	9.2 DIF	SET-UP	94
	9.2.1	Die design	
	9.2.2	Die handling	94
	9.2.3	Die setting	94
	9.2.4	Die fastening	
	9.2.5	Turnover bar	
	9.2.6	Die adjustment, cleaning, or repair	
	9.2.7	High pressure die nitrogen systems	97
	9.2.8	Die tryout	97
	9.3 OP	ERATION	97
	9.3.1	Configuration of the system	97
	9.3.2	Work area	97
	9.3.3	Material threading / tailout	
	9.3.4	Hand-feeding tools	
	9.3.5	Removal of stuck material from die area	
	9.3.6	Removal of material from Scrap Chutes and Covers	
	9.3.7	Lubrication of material or die components	
	9.3.8	Press capacity	
	9.3.9	Die cushion	100
	9.3.10	Stopping performance monitor use	101
	9.4 INS	PECTION AND MAINTENANCE	101
	9.4.1	Program	101
	9.4.3	Periodic testing of the slide lock(s)	
	9.4.4	Stopping performance	
	9.5 TR	AINING	102
	9.6 SU	PERVISION	104
	9./ AC	UESS CONTROL	104
	9.8 M	DVING BOLSTEKS	104
	9.0.1	Doisier Molion	104
	9.0.5	Automatic bolster movement	105
	9.0.4	boisier singing uren sujeguaraing	105
1	0 ADD	ITIONAL REQUIREMENTS FOR PSDI OPERATION	
	10.1 GE	NERAL	106
	10.2 "PA	SS-THROUGH" HAZARDS	106
	10.3 MU	LTIPLE OPERATORS AND MULTIPLE PSDI ACTUATING CONTROLS	106
	10.4 PRI	ESENCE-SENSING DEVICE USED FOR PSDI	106
	10.5 PA	RT SENSING DEVICE FOR PSDI	107
	10.6 PSI	DI SYSTEM DOCUMENTATION	107
A	NNEX A	- FIGURES	
A	NNEX B-	- EXAMPLES OF TASK-BASED HAZARDS	
A	NNEX C	- SAFETY DISTANCE	124

AMERICAN	NATIONAL	STANDARD
/		• • • • • • • • • • •

ANNEX D – DESIGN CONSIDERATIONS FOR POWER PRESS CONTROLS	133
ANNEX F – PERFORMANCE OF THE SAFETY-RELATED FUNCTION(S)	139
ANNEX G – FLOW CHARTS FOR MODE SELECTION AND INITIATION OR ENABLING	141
ANNEX H – CHECK LIST	146
ANNEX I - TYPICAL DIE SETTING PROCEDURES	162
ANNEX J – ANSI / AIHA Z10	163
ANNEX K – PRESS INSPECTION REPORT, CHECKLIST & MAINTENANCE RECORD1	165

	0

#### Foreword

#### (This foreword is not part of the requirements of American National Standard B11.1–2009 (R20))

The objective of this standard is to eliminate injuries to personnel from mechanical power press production systems by establishing requirements for the construction of mechanical power presses, and requirements for the set–up, operation and maintenance of the production systems in which presses are used. This standard should be used by builders, users, modifiers, and rebuilders, as well as by the appropriate authority having jurisdiction. Responsibilities have been assigned to the supplier (i.e., the manufacturer, the rebuilder and the modifier), the user, and the user personnel to implement this standard (see flowchart in the Introduction).

The words "safe" and "safety" are not absolutes. While the goal of this standard is to eliminate injuries, it is recognized that risk cannot be reduced to zero in any human activity. This standard is not intended to replace good judgment and personal responsibility. Operator skill, attitude, training, and experience are safety factors that must be considered by the user.

The safeguarding of press production systems in stamping operations is complicated by the wide variety of operations and operating conditions, due to the variations in size, speed and type of press used; the size, thickness and kind of pieces to be worked; the design and construction of dies; the required accuracy of the finished work; the skill of operators; the length of run; and the method of feeding, including part and scrap removal. Because of these varying factors in the operations and in the workplace, a wide variety of point–of–operation safeguarding methods (guards and protective devices) has been covered in this standard.

Point-of-operation safeguarding, the single most important factor in the elimination of injuries from presses, can only be determined by the user. A production system consists of the press as one component, dies (tooling) as another component, feeding methods (including part or scrap removal) as a third component, and point-of-operation safeguarding as the fourth component. The vital fourth component can be evaluated for effectiveness only after the first three components and operator involvements are known. Since this information is known only by the user, the responsibility for conformance with clause 8 has been assigned accordingly. The assignment of responsibility of the user for proper point-of-operation safeguarding has existed since the first B11.1 standard, approved in 1922.

Mechanical power presses and associated equipment technologies are continuously evolving. This standard reflects the most commonly used and time-tested state of the art at the time of its approval. The inclusion or omission of language relative to any evolving technology, either in the requirements or explanatory area of this standard, in no way infers acceptance or rejection of such technologies.

#### HISTORY

The project on Safety Standard for Power Presses, B11, was initiated under the procedures of the American Engineering Standards Committee (which became the American Standards Association, the United States of America Standards Institute, and in 1969 the American National Standards Institute), with the National Safety Council as sponsor. The first standard, bearing the title *Safety Code for Power Presses and Foot and Hand Presses*, was developed by Sectional Committee B11 and was approved on November 13, 1922. Only two purposes of that "code" were listed. The first and primary use was for state industrial commissions in developing their workplace codes. The second use was as an operating guide for users operating press production systems. Revisions of the standard were issued on November 11, 1926; October 22, 1937; January 12, 1948; January 19, 1960; February 17, 1971; January 22, 1982; April 4, 1988; and November 6, 2001.

The philosophy underlying the 1971 standard was hands–out–of–die operation (HOOD). After the adoption of the 1971 standard by ANSI and its reference by OSHA regulations, many users documented an absolute inability to meet the hands–out–of–die objective. Accordingly, in 1974 OSHA modified the HOOD requirement, and subsequent versions of the ANSI B11.1 standard incorporate that modification. However, HOOD should be considered in the application of the press production system, with appropriate safeguarding, to enhance the safe operation of mechanical power presses.

#### AMERICAN NATIONAL STANDARD

In this 2009 edition of the standard, the B11.1 Subcommittee reviewed the B11.1 2001 standard to incorporate current mechanical power press safety practice, and to increase explanatory material related to the standard. New areas that have been added include requirements for risk assessment and risk reduction for increasingly complex automatic press production systems that may include tandem and transfer presses with use of perimeter safeguarding. In addition, new pressroom technology including direct drive servo presses has been incorporated. The current edition also integrates NFPA 79 requirements directly within the standard, including two hand control and stop function requirements, moving parts (other than point-of-operation) and safeguarding supplier responsibilities. Finally, the current edition of ANSI B11.1 provided new requirements for slide locks, moving bolsters and scrap chutes.

Subsequent to beginning the revision of B11.1, the ANSI B11 Accredited Standards Committee (ASC) authorized creation of an overarching ("A-level") standard dealing with general safety requirements for the entire series of machines. ANSI B11 was approved in August 2008. Since B11.1 was already well into its revision at that point, the B11 ASC agreed to allow this current (2009) version of the ANSI B11.1 standard to proceed absent integration with the ANSI B11 "A-level" standard.

#### Effective Date

The following information on effective dates is informative guidance only, and not a normative part of this standard. The subcommittee recognizes that some period of time after the approval date on the title page of this document is necessary for suppliers and users to develop new designs, and/or modify existing designs or manufacturing processes in order to incorporate the new and/or revised requirements of this standard into their product development or production system.

The subcommittee recommends that suppliers complete and implement design changes for new machine tools and machine tool systems within 30 months of the approval of this standard.

The subcommittee recommends that users should evaluate whether an existing machine tool and machine tool system has acceptable risk within 30 months of the approval date of this standard using generally recognized risk assessment methods. If the risk assessment shows that modification(s) is necessary, refer to the requirements of this standard or the machine specific standard to implement protective measures for appropriate risk reduction.

Inquiries with respect to interpretations of this standard, and suggestions for its improvement, are welcomed and should be sent to B11 Standards, Inc. POB 690905, Houston, TX, 77269-0905 Attention: B11 Secretariat. This standard was processed and submitted for ANSI approval by the B11 Accredited Standards Committee on Safety Standards for Machines. Committee approval of this standard does not necessarily imply that all committee members voted for its approval. At the time this standard was approved as an American National Standard, the ANSI B11 Accredited Standards Committee was composed of the following member organizations:

John W. Russell, PE, CSP, Chairman Gary D. Kopps, Vice-Chairman David A. Felinski, Secretary

Organizations Represented	Name of Representative		
•	Delegate	Alternate	
Aerospace Industries Association of America	Willard J. Wood, ARM	Lance E. Chandler, PE	
Aluminum Extruders Council	Melvin Mitchell	Doug Hart	
American Society of Safety Engineers	Bruce W. Main, PE	George V. Karosas, PE, CSP	
Association For Manufacturing Technology	Russell A. Bensman	Alan Metelsky	
Automotive Industry Action Group	Nancy Malo	David A. Lalain	
The Boeing Company	Don R. Nelson	Joe Oberuc	
Canadian Standards Association	Elizabeth Rankin	Tom Eastwood	
Can Manufacturers Institute	Geoff Cullen	Jenny Day	

© 2020 B11 Standards, Inc.

#### AMERICAN NATIONAL STANDARD

Deere and Company **General Motors Corporation** Metal Building Manufacturers Association Metal Powder Industries Federation National Institute for Occupational Safety and Health Occupational Safety & Health Administration Packaging Machinery Manufacturers Institute Pilz Automation Safety, LP **Property Casualty Insurers** Precision Metalforming Association Presence Sensing Device Manufacturers Association **Rockwell Automation Robotic Industries Association OMRON Scientific Technologies Incorporated** Sheet Metal & Air Cond. Contractors Natl. Assn. System Safety Society **Tooling and Manufacturing Association** Toyota Motor Manufacturing North America

Gary D. Kopps Michael Douglas Charles M. Stockinger Dennis R. Cloutier, CSP Richard S. Current, PE Kenneth Stevanus Charles F. Haves Roberta Nelson Shea John W. Russell, PE, CSP William E. Gaskin James V. Kirton Michael B. Miller Jeff Fryman Frank Webster Michael McCullion John Etherton; PhD, PE **Daniel Kiraly Barry Boggs** 

Scott Fowler Michael Taubitz Charles E. Praeger Teresa F. Stillman James R. Harris, PE Robert Bell Maria Ferrante Craig Torrance / Lee Burk Keith Lessner James G. Barrett, PhD Michael S. Carlson Steve Dukich

Christopher Soranno Roy Brown Rod Simmons, PhD

Todd Mills

At the time this standard was approved, the ANSI **B11.1 Subcommittee** had the following members who participated in the development of this revision:

Dennis Cloutier, Co-Chairman Russell Bensman, Co-Chairman Cindy Haas, B11.1 Secretary James G. Barrett, PhD Kelyn Brown Stanford A. Brubaker Scott Buchanan Lee Burk Michael Carlson Wayne Casebolt Gary Dunn **Dennis Ebens David Hayes** Heinz Knackstedt Joseph Knapp Scott E. Miller Joseph M. Mitory William S. Roorda, PE Theodore Sberna George M. Schreck Kyle Sullivan Jerome B. (J.B.) Titus Jim Van Kessel, P.Eng. Walter Veugen Ron Walters Robert Weaver

**Cloutier Consulting** The Minster Machine Company The Association For Manufacturing Technology Link Systems Dana Holding Corporation. Liberty Mutual Insurance Group Toyota Engineering and Manufacturing America Pilz Automation Safety L.P. **Banner Engineering** General Motors Corporation Dunn Consulting **Danray Products LLC** Wintriss Controls of Honeywell C & E Sales, Inc. Johnson Controls, Inc. **AIDA-America** Corporation **Chrysler Corporation** Alcona Associates **Applied Engineering Concepts** Komatsu America Industries, LLC **General Motors Corporation** Siemens Energy & Automation JVK Industrial Automation Inc. Veugen Integrated Technologies Ltd. **Chrysler Corporation** Schuler Incorporated

# Explanation of the format, and ANSI B11 conventions

The standard uses a two-column format to provide supporting information for requirements. The material in the left column is confined to "Standards Requirements" only, and is so The right column, captioned "Explanatory captioned. Information" contains information that the writina Subcommittee believed would help to clarify the requirements contained in the standard. This column should not be construed as being a part of the requirements of this American National Standard.

As in all American National Standards, the term "SHALL" denotes a requirement that is to be strictly followed in order to conform to this standard; no deviation is permitted. The term "SHOULD" denotes a recommendation, a practice or condition among several alternatives, or a preferred method or course of action.

Similarly, the term "CAN" denotes a possibility, ability or capability, whether physical or causal, and the term "MAY" denotes a permissible course of action within the limits of the standard.

**B11 conventions:** Operating rules (safe practices) are not included in either column of this standard unless they are of such nature as to be vital safety requirements, equal in weight to other requirements, or guides to assist in conformance with the standard. The B11 standards generally use the term "OR" as an inclusive disjunction, meaning one or the other or both, but on occasion will use the term "and/or" to emphasize the fact that both are fully intended in cases where the Subcommittee believed it was imperative to make that clear. A distinction between the terms "individual" and "personnel" is drawn. Individual includes personnel (employees. subcontractors, consultants, or other contract workers under the indirect control of the supplier or user) but also encompasses persons who are not under the direct or indirect control of the supplier or user (e.g., visitors, vendors, etc.).

Suggestions for improvement of this standard will be welcome. They should be sent to B11 Standards, Inc., POB 690905, Houston, TX, 77269-0905 - Attention: B11 Secretariat.

#### Introduction

The requirements of this ANSI standard are grouped according to those that apply to the supplier (i.e., manufacturer, rebuilder, modifier) and user. Some are shared between the supplier and user and are so indicated. Figure 1 provides an overview of this standard and in particular the responsibilities of and requirements for the supplier and user, including the user personnel. Numbers in parentheses denote the particular clause or subclause of the standard.



Figure 1 – General layout of the standard showing the various responsibilities

#### Notes for Figure 1:

- 1) Scope Provides the boundaries or limits of the standard (i.e., what is/is not included).
- Normative references Other standards which in whole or in part provide additional requirements when referenced in the normative text (i.e., left-hand column of clauses 4 – 9) of this standard.
- 3) Definitions Terms used in this standard, together with their definitions (terms used in the same context as are generally understood and commonly used in everyday English are not defined).
- Responsibility The general responsibilities of the supplier (builder), user, and the user personnel are listed in clause 4 together with which of the remaining clauses they have primary responsibility.
- 5) Hazard control (task/hazard identification & risk assessment/risk reduction) Although clause 5 is intended to require a shared responsibility between supplier and user, the requirements of this clause may fall primarily on either entity (see B11.TR3 for further explanation of hazard/task identification and risk assessment/risk reduction).
- 6) Design and construction It is assumed that the supplier will be responsible for the requirements of clause 6 with the understanding that the user may add to or modify these requirements through the purchase agreement.
- Installation, testing and start-up Although the requirements of clause 7 are predominantly the responsibility of the user, the supplier will normally provide assistance either directly (providing personnel) or indirectly (instruction materials).
- 8) Safeguarding This is normally a shared responsibility but often, either the supplier or the user will provide the requirements of clause 8.
- 9) Operation and maintenance The user is normally responsible for the requirements of clause 9 with possible assistance from the supplier for training.

A solid line between a block showing reference standard(s) and a block showing a normative clause denotes part of the requirements. A dashed line denotes an informative reference.

# American National Standard for Machine Tools -Safety Requirements for Mechanical Power Presses

## STANDARDS REQUIREMENTS

## 1 Scope

The requirements of this standard apply only to those mechanically powered machines, commonly referred to as mechanical power presses, which transmit force mechanically to cut, form, or assemble metal or other materials by means of tools or dies attached to or operated by slides.

#### 1.1 Inclusions

The requirements of this standard shall apply to:

- Mechanical power presses (as above);
- transfer presses;
- tandem line presses;
- presses used in production cells;
- automatically fed presses;
- manually fed presses.

#### 1.2 Exclusions

Excluded from the requirements of this standard are the following:

- a) bulldozer
- b) cold header and cold former
- c) eyelet machine

## **EXPLANATORY INFORMATION**

(Not part of the requirements of this American National Standard for Machine Tools – Safety requirements for Mechanical Power Presses - ANSI B11.1 – 2009 (R20))

## **E1**

See Annex A, Figures A.1 and A.2.

The requirements of this standard are aimed at eliminating injuries to operator, maintenance, and set–up personnel, while working on or adjacent to a mechanical power press.

This standard does not establish requirements for personal protective equipment that may be needed for specific operations.

E1.1

See also, Annex A, Figures A.18 and A.20. See also, Annex A, Figure A.19.

## E1.2

These exclusions exempt machines that normally do not have the characteristics of mechanical power presses, or are addressed by specific standards. If a machine is not addressed by a specific B11 standard, see ANSI B11 (*General Safety Requirements*) for guidance.

a) A slow-acting horizontal mechanical press with a large bed used for bending, straightening, etc. The work, which is done between dies, can be either hot or cold. The machine is closely allied to a forging machine.

b) Cold headers and cold formers perform many operations such as shearing, heading, upsetting, extruding, trimming, forming, cold working or warm forming material by means of tools and dies. See ANSI B11.7.

c) An automatic multiple station transfer feed machine for making drawn stampings by use of cam-driven adjustable plungers, acting from above and below the workpiece, and to which individual tool elements are attached.