

ANSI B11.3 - 2012

American National Standard for Machines –

Safety Requirements for Power Press Brakes

Secretariat and Accredited Standards Developer:
B11 Standards, Inc.
POB 690905
Houston, TX 77269

APPROVED: 20 JULY 2012

by the **American National Standards Institute**



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Table of Contents		Page
FOREWORD		7
HISTORY		7
EFFECTIVE DATE		8
DEVELOPMENT		8
 INTRODUCTION		 10
 1 SCOPE		 13
1.1 General.....		13
1.2 Exclusions.....		13
2 NORMATIVE REFERENCES		14
2.1 Informative references.....		15
3 DEFINITIONS		16
4 RESPONSIBILITY		20
4.1 Supplier responsibilities.....		20
4.2 User responsibilities.....		21
4.3 Personnel responsibilities.....		21
5 RISK ASSESSMENT PROCESS		21
6 DESIGN, CONSTRUCTION, RECONSTRUCTION, AND MODIFICATION		23
6.1 General requirements for all press brakes.....		23
6.1.1 Hazards associated with broken components.....		23
6.1.2 Tool fastening provisions.....		23
6.1.3 Opening of tool space.....		24
6.1.4 Press brake capacity data plate.....		24
6.1.5 Pressure rating of components.....		24
6.1.6 Stored and residual energy.....		24
6.1.7 Performance of safety-related function(s).....		25
6.1.8 Stopping performance monitor.....		25
6.1.9 Presence-Sensing Device Initiation (PSDI).....		28
6.2 Electrical controls.....		30
6.2.1 Disconnect means.....		30
6.2.2 General requirements for stop functions, circuits and actuators.....		30
6.2.3 Motor start actuator.....		34
6.2.4 Motor starter.....		35
6.2.5 Top stop control.....		35
6.2.6 Return (stop-return) control.....		35
6.2.7 Voltage.....		35
6.2.8 Grounds.....		36
6.2.9 External and line interferences.....		36
6.3 Requirements for mechanical press brakes.....		36
6.3.1 Ram counterbalance systems.....		36

6.3.2	Clutches and brakes	36
6.3.3	Cycle control of mechanically actuated or air operated press brakes	38
6.3.4	Mode control	39
6.3.5	Actuating means	45
6.3.6	Motorized ram adjustment	46
6.4	Requirements for hydraulic press brakes.....	47
6.4.1	Return (stop-return) control.....	47
6.4.2	Ram counterbalance system	47
6.4.3	Foot pedal (mechanical).....	47
6.4.4	Unintended actuation by foot treadle	48
6.4.5	Mode control for hydraulic press brakes	48
6.4.6	Actuating means	54
6.4.7	Hydraulic components and circuits	55
6.5	Requirements for pneumatic press brakes.....	58
6.5.1	Return (stop-return) control.....	58
6.5.2	Ram counterbalance systems	58
6.5.3	Air-controlling equipment.....	58
6.5.4	Actuating means	59
6.5.5	Pneumatic components and circuits.....	59
7	LAYOUT, INSTALLATION, TESTING AND START-UP	61
7.1	General	61
7.1.1	Lockout/Tagout	61
7.1.2	Lighting.....	62
7.2	Layout.....	62
7.2.1	Production operations	62
7.2.2	Set-up and maintenance	62
7.3	Installation.....	62
7.3.1	Foundation	62
7.3.2	Lifting of machine components.....	62
7.3.3	Anchoring.....	62
7.3.4	Safety considerations	62
7.4	Testing and start-up for press brakes	63
7.4.1	Procedures	63
7.4.2	Assigned personnel	63
7.4.3	Safeguarding	63
8	SAFEGUARDING.....	63
8.1	Hazards associated with press brake production systems other than point-of-operation hazards.....	63
8.2	Hazards associated with falling or broken components.....	64
8.3	Performance of the safety-related function(s)	65
8.4	Perimeter safeguarding.....	66
8.5	Hazards associated with point of operation	66
8.5.1	Safeguarding provisions.....	66
8.6	Guards: fixed, adjustable, and interlocked	67
8.6.1	Design and construction.....	67
8.6.2	Installation and operation	69
8.7	Point of operation safeguarding devices	72

8.7.1	Movable barrier devices.....	72
8.7.2	Presence-sensing safeguarding device.....	74
8.7.3	Pull-back safeguarding device	79
8.7.4	Restraint safeguarding device (holdout).....	80
8.7.5	Two-hand control safeguarding device.....	81
8.7.6	Single control safeguarding device.....	83
8.7.7	Close proximity point of operation AOPD safeguarding device	84
8.8	Safe speed safeguarding.....	88
8.9	Safe distance safeguarding	89
8.10	Auxiliary safety aids	90
9	SET-UP, OPERATION AND MAINTENANCE	91
9.1	General	91
9.2	Machine set-up procedures	91
9.2.1	Die set-up procedures.....	92
9.3	Operation.....	96
9.3.1	Observations	96
9.4	Maintenance	98
9.4.1	General	98
9.4.2	Maintenance inspections	100
9.5	Supervision	101
9.6	Control of hazardous energy	101
9.7	Initiation of normal operation.....	101
9.8	Safety signs.....	102
9.9	Personal protective equipment (PPE)	102
10	TRAINING	102
10.1	General	102
10.2	Training elements	103
10.2.1	Training programs.....	104
10.3	Operator training.....	105
10.4	Maintenance personnel training	105
10.5	Supervisor training	105
10.6	Re-training.....	105
11	ADDITIONAL REQUIREMENTS FOR PSDI OPERATION.....	106
11.1	General	106
11.2	"Pass-through" hazards.....	106
11.3	Multiple operators.....	106
11.4	Presence-sensing device used for PSDI	106
11.5	Supplemental guards or devices	107
11.6	Hand tools	107
11.7	Inspection and maintenance	107
11.8	Operator Training.....	107

ANNEX A – FIGURES	109
ANNEX B – TASK / HAZARD IDENTIFICATION.....	120
ANNEX C – PERFORMANCE OF THE SAFETY-RELATED FUNCTION(S).....	122
ANNEX D – EXAMPLE MANUAL TEST PROCEDURE FOR CLOSE PROXIMITY POINT OF OPERATION AOPD SAFEGUARDING DEVICES	123
ANNEX E – SAFEGUARDING FLOWCHART	124
ANNEX F – CHECKLIST	125
ANNEX G – EXAMPLE DIE SETTING PROCEDURE	126
ANNEX H – AUTOMATIC BACKGAGE HAZARDS	130
ANNEX I – GENERAL GUIDELINES FOR OPERATOR TRAINING	131

List of FIGURES

Figure 1: Organization of the B11 Series of Documents	10
Figure 2: Typical layout of B11 base standards showing the various responsibilities.....	12
Figure 5: The Risk Assessment Process.....	22
Figure A.1: Example of Material Position Gage and Work Support	109
Figure A.2: Example of a Removable and Adjustable Mechanical Foot Pedal and Locking Lever	109
Figure A.3: Example of Awareness Barrier with Safe Distance Safeguarding	110
Figure A.4: Example of a Movable Barrier Device	110
Figure A.5: Example of Presence-Sensing Device	111
Figure A.6: Example of Horizontal and Vertical Presence-Sensing Devices.....	111
Figure A.7: Example of a Pullback Device.....	112
Figure A.8: Example of Restraints with Two Operators.....	112
Figure A.9: Example of a Restraint.....	113
Figure A.10: Example of Two Operators with Two-Hand Control Mounted to Machine.....	113
Figure A.11: Example of Two-Hand Control Mounted on Pedestal	114
Figure A.12: Examples of Hand-Feeding Tools	114
Figure A.13: Example of Hand Tool Feeding.....	115
Figure A.14: Example of Safe-Distance Safeguarding.....	115
Figure A.15: Proper Holding of Workpiece	116
Figure A.16: Typical Guards on Sides of Point of Operation	116
Figure A.17: Example of Die Space	117
Figure A.18: Example of Foot Treadle with Guard.....	117
Figure A.19: Example of Foot Control	118
Figure A.20: Protection Zone Dimensions for Close Proximity POO AOPD Safeguarding Devices.....	118
Figure A.21: Close Proximity AOPD.....	119
Figure D: Test Piece for Close Proximity POO AOPD Safeguarding Devices.....	123

Foreword (This Foreword is informative and not part of the normative requirements of American National Standard ANSI B11.3-2012.)

The primary objective of this standard is to eliminate, control or reduce hazards to individuals associated with power press brakes by establishing requirements for the design, construction, operation and maintenance of these machines. To accomplish this objective, responsibilities have been assigned to the supplier (e.g., manufacturer, modifier, rebuilder and integrator), the user, and individuals in the working environment.

The words "safe" and "safety" are not absolutes. An element of safety is attitude. While the objective of this standard is to eliminate, control, or reduce hazards, this standard recognizes that hazards cannot be practically reduced to zero in any human activity. This standard is not intended to replace good judgment, proper training, and personal responsibility. Operator skill, job monotony, fatigue, and experience are safety factors that should be considered by the user.

HISTORY

The original B11.3 standard was approved in 1973 and revised in 1982 and again in 2002. In the 2002 document, powered folding machines were included in the scope of the standard because they were predominantly similar to press brakes in that they are metal bending machines and they were not covered by any other standard. During the current revision process, the subcommittee determined that powered folding machines have evolved into multi-axis machines that process metal in numerous ways, many of which are unlike a press brake. Additionally, there is now a type-A standard, ANSI B11.0, which can be used in conjunction with the type-B standard ANSI B11.19 to provide guidance for the safe use of machines in general. It is for these reasons that the subcommittee decided to exclude powered folding machines in the scope of the 2012 ANSI B11.3 standard.

This current 2012 standard was revised by the B11.3 Subcommittee, processed and administered by the Secretariat, and approved by the B11 Accredited Standards Committee for submittal to the ANSI Executive Standards Council as an American National Standard. New topics included in this revision are the "close proximity point of operation AOPD" safeguarding devices, and a safeguarding means called "Safe Speed." In addition, this revision incorporates the B11 Accredited Standards Committee's "FASTT" initiative, which defined common language to be used by the entire series of ANSI B11 standards. Consequently, many definitions of common terms contained in the previous edition of B11.3 can be now be found in the ANSI B11.0 and ANSI B11.19 standards. This initiative also significantly impacted clauses 4, 5, 7, 9 and a brand new clause 10 and Annex I on training was added.

The B11 standards for machine tools were first approved beginning with safety requirements for power presses in 1922. Since that time, safety requirements for a variety of machine tools have been developed and continually updated and revised to become a series of some 30 B11 standards and technical reports. Maintaining these documents with consistent language proved a significant challenge. In 2008 ANSI B11 was published with the long term objective to reorganize the B11 family of standards by gathering the requirements common to many or most of the B11 standards into a single document while retaining the machine tool specific requirements in the machine-specific standards. This B11.3 standard is intended to be used with ANSI B11.0 and ANSI B11.19. The requirements of all three standards must be met as applicable to a particular machine.

Power press brake technology is 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.

Suggestions for improvement to the content of this standard are welcomed. Similarly, any inquiries with respect to the application of the substantive requirements of this standard are to be sent to B11 Standards, Inc., PO Box 690905, Houston, Texas 77269-0905, USA. Attention: B11 Secretariat.

EFFECTIVE DATE

The following information on effective dates is informative guidance only, and not a normative part of this standard. This 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, or modify existing designs or manufacturing processes in order to incorporate the new or revised requirements of this standard into their product development or production system.

This Subcommittee recommends that suppliers complete and implement design changes for new machines and machinery systems within 30 months of the approval of this standard.

The Subcommittee recommends that users evaluate whether existing machinery and machinery systems have 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 to implement risk reduction measures (protective measures) for appropriate risk reduction.

Explanation of the format of the standard

This ANSI B11.3 – 2012 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 captioned. The right column, captioned “Explanatory Information” contains information that the writing Subcommittee felt would clarify the standard. This column should not be construed as being a part of the requirements of this American National Standard.

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 compliance with the 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.

By convention, the B11 standards generally do not use the term “and/or” but instead, the term “OR” is used as an inclusive disjunction, meaning *one or the other or both*. When “and/or” is used, it is intended by the standard writers to emphasize the point.

DEVELOPMENT

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 document was approved as an American National Standard, the ANSI B11 Accredited Standards Committee was composed of the following member organizations:

Alan Metelsky, Chairman
Barry Boggs, Vice-Chairman
David A. Felinski, Secretary

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Aluminum Extruders Council	Melvin Mitchell	Scott J. Burkett
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Association For Manufacturing Technology	Russell A. Bensman	Alan Metelsky
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Metal Building Manufacturers Association	Charles M. Stockinger	Charles E. Praeger
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System Safety Society	John Etherton, PhD, CSP	Rod Simmons, PhD
Toyota Motor Manufacturing North America	Barry Boggs	Todd Mills
International United Automobile Workers	Tom Ford	

At the time this standard was approved, the ANSI **B11.3 Subcommittee** had the following members who participated in the development of this revision:

Name	Company
James V. Kirton, Co-Chairman	Kirton Industrial Equipment, LLC
Christopher Soranno, Co-Chairman	Omron STI
David A. Felinski, Secretary	B11 Standards, Inc.
Rob Appleyard	LazerSafe, Pty.
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Introduction

The primary purpose of every machine tool is to process parts. This is accomplished by the machine imparting process energy onto the workpiece. Inadvertent interference with, or accidental misdirection of the released energy during production, maintenance, commissioning and de-commissioning may result in injury. This standard recognizes that zero risk does not exist and cannot be attained. However, a good faith approach to risk assessment and risk reduction should achieve an acceptable risk level. Additional activities might be needed to monitor the ongoing effectiveness of the risk reduction measures in place.

The primary purpose of the ANSI B11 series of machine safety standards is to devise and propose ways to minimize risks of the potential hazards. This can be accomplished either by an appropriate machine design or by restricting personnel or other individuals' access to hazard zones, and by devising work procedures to minimize personnel exposure to hazardous situations. This is the essence of the ANSI B11 series of safety standards.

Organization and Application of B11 Series of Documents

The B11 series of documents can be associated with the ISO "Type A-B-C" structure as described below:

- **Type-A standards** (basis standards) give basic concepts, principles for design, and general aspects that can be applied to machinery;
- **Type-B standards** (generic safety standards) deal with one or more safety aspects or one or more types of safeguards that can be used across a wide range of machinery;
- **Type-C standards** (machinery safety standards) deal with detailed safety requirements for a particular machine or group of machines.

This ANSI B11.3 standard on power press brakes is a "Type-C" standard. The ANSI B11.0 standard on general safety requirements common to ANSI B11 machines is primarily a "Type-A" standard in that it applies to a broad array of machines and contains very general requirements. However, in many areas it also contains very specific requirements. B11.19, B11.20 and the B11 series Technical Reports are all typical "Type-B" documents addressing general safety elements that can be applied across a wide range of machinery (B11.19) or as a standard when combining machines (B11.20). The B11 series of Technical Reports are informative documents that may be generally applied to many machines, and as such would fall into the "Type-B" group. The machine-specific (Type-C) B11 standards contain detailed safety requirements for a particular machine or group of machines (such as in the case of this standard). The B11.0 and the machine-specific B11 standards are intended to be used concurrently by the supplier and user of machines. When a Type-C standard deviates from one or more provisions dealt with by this standard or by a Type-B standard, the Type-C standard requirement generally takes precedence. Any deviation in conforming to a requirement of any standard should be carefully evaluated and based on a documented risk assessment.

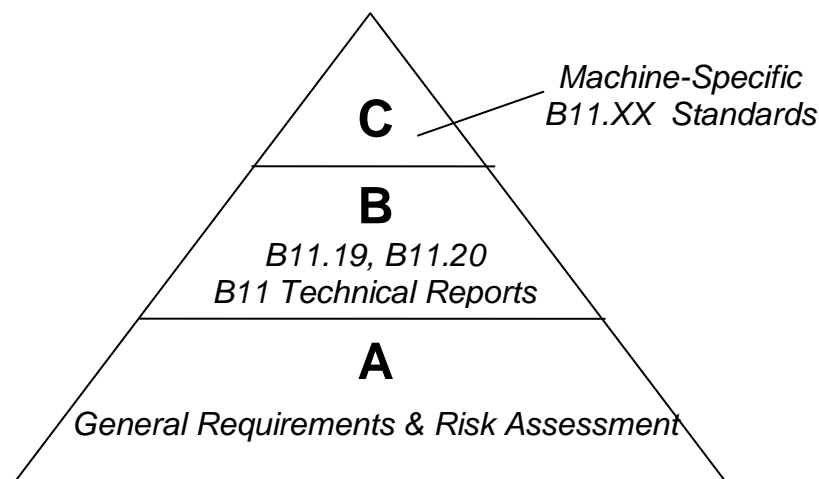


Figure 1 — Organization of the B11 Series of Documents

Figure 2 (following page) 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. 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.

Notes for Figure 2:

- 1) Scope – Provides the boundaries or limits of the standard (i.e., what is/is not included in the coverage or requirements).
- 2) 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 in a unique or particular manner, together with their definitions (terms used in the same context as are generally understood and commonly used in everyday English are not defined).
- 4) 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) Risk assessment process – Clause 5 presents the general approach to risk assessment (see B11.0 [B11.TR3] for further explanation of hazard/task identification and risk assessment/risk reduction).
- 6) Design and construction – Generally, the supplier will be responsible for the requirements of clause 6, understanding that the user may add to or modify these requirements through the purchase agreement.
- 7) Layout, 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 between the supplier and user but often, either the supplier or the user will provide and/or meet most or even all of the requirements of clause 8.
- 9) Setup, operation and maintenance – The user is generally responsible for the requirements of clause 9, with possible assistance from the supplier for training.
- 10) Training – The user is generally responsible for the requirements of clause 10, with possible assistance from the supplier for materials or the training itself.

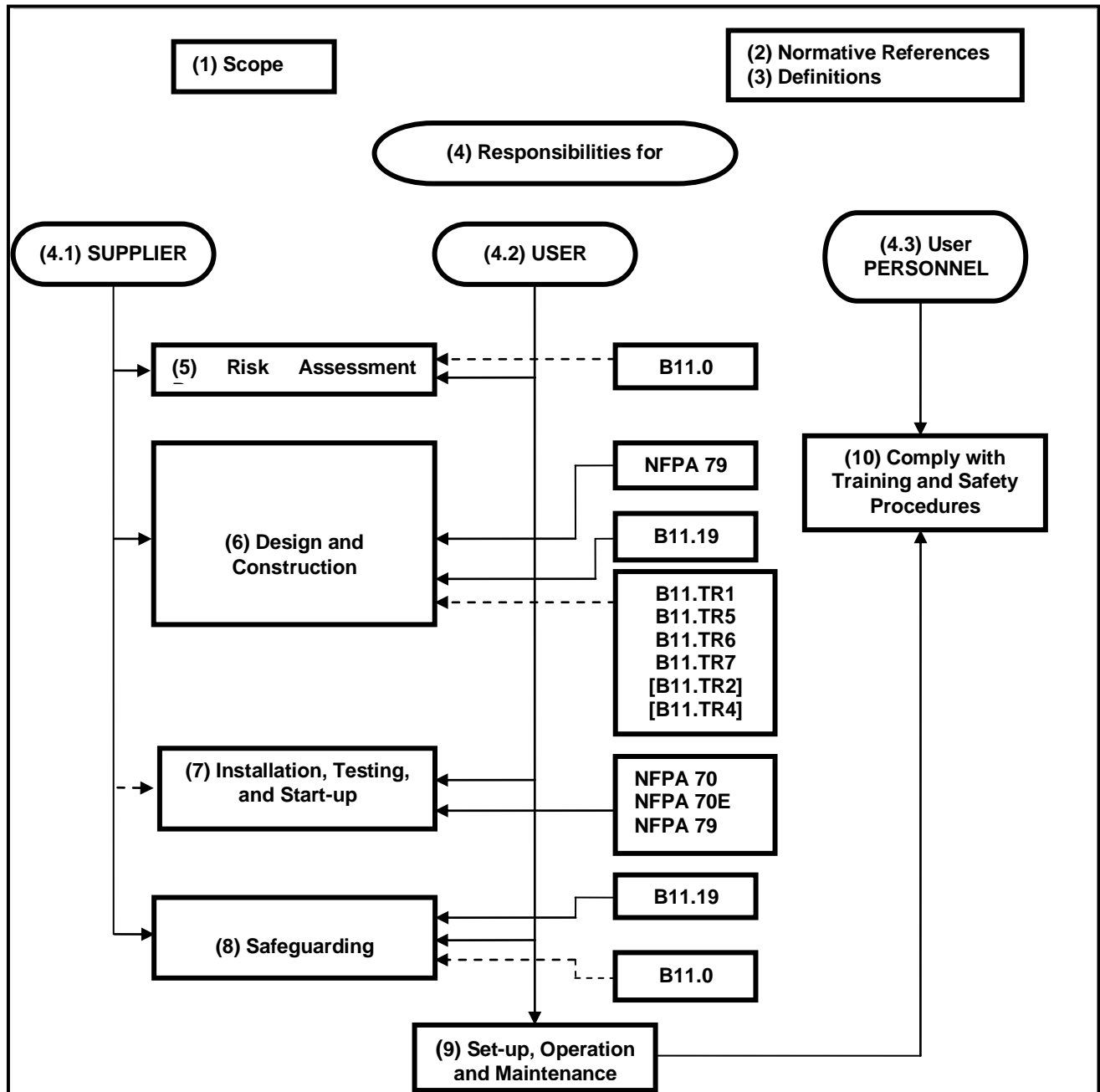


Figure 2 – Typical layout of B11 base standards showing the various responsibilities

STANDARD REQUIREMENTS

EXPLANATORY INFORMATION

American National Standard for Machines-
Safety Requirements for Power Press Brakes

STANDARD REQUIREMENTS**EXPLANATORY INFORMATION**

(Not part of the requirements of this American National Standard for Machines - *Safety Requirements for Power Press Brakes* - ANSI B11.3–2012)

1 Scope**1.1 General**

The requirements of this standard apply to those machines classified as power press brakes (hereinafter referred to simply as “press brakes”), which are designed and constructed for the specific purpose of bending material.

Where used in this standard, the terms *machine* or *machine system* refer to the press brake or press brake production system, respectively.

1.2 Exclusions

Excluded from the requirements of this standard are:

- Manual apron brakes;
- Folding machines;
- Hand brakes;
- Hydraulic or pneumatic power presses;

E1.1

To achieve this purpose, the press brake is provided with a plate-type ram and a plate-type bed with standard provisions for attaching standardized press brake tooling.

When used for operations other than bending material, other standards may provide additional information and requirements for the specific use or application.

E1.2

These exclusions exempt machines that normally do not have the characteristics of power press brakes, or are addressed by specific standards. If a machine is not addressed by a specific B11 standard, see ANSI B11.0 for guidance on general safety / risk assessment, and ANSI B11.19 for guidance on safeguarding.

- An apron brake uses a clamping bar and several removable blocks which may be removed and rearranged to permit bending of restricted areas of a piece of sheet material or of already partially formed pieces. Also called ‘box-and-pan brake.’
- A folding machine typically uses a clamping beam and a folding beam to fold the workpiece. Also called a ‘powered folding machine’ or ‘bending brake.’
- A hand brake bends material by using a hinged clamping bar to hold the metal down against the bed. A hinged bending “leaf” is manually lifted to fold the metal around the fulcrum point of the clamping bar to the desired angle. Also called ‘leaf brake.’
- A hydraulically or pneumatically powered machine which transmits force hydraulically or pneumatically to cut, form, or assemble metal or other materials by means of tools or