

# **PHILIPPINE NATIONAL STANDARD**

**PNS/BAFS 390:2024  
ICS 65.060.01**

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## **Operator's Manual for Agricultural and Biosystems Power and Machinery — Guidelines**



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Operator's Manual for Agricultural and Biosystems Power and Machinery —  
Guidelines  
PNS/BAFS 390:2024  
ICS 65.060.01

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## Foreword

In 2013, the Department of Agriculture (DA)-Bureau of Agriculture and Fisheries Standards (BAFS) in collaboration with concerned agencies was prescribed to update existing standards under the Philippine Agricultural Engineering Standards (PAES) as stated under Rule 21.2 of Implementing Rules and Regulations (IRR) for Republic Act No. 10601 otherwise known as the “Agricultural and Fisheries Mechanization (AFMech) Law”.

In 2024, the DA-BAFS conducted a Table Review of PAES 102:2000 (Agricultural machinery — Operator's manual — Content and presentation). It intends to re-evaluate and validate if the provisions of the aged standard (i.e., at least five years since its approval) for operator's manual are still relevant and reflective to the current regulatory and industry requirements. The Table Review verified if the standard is technically up to date and aligned with the current recommendations and interpretations regarding quality and usability of operator's manuals. Based on the Table Review, the Technical Working Group (TWG) deemed it necessary to revise the standard given the significant updates in specific provisions.

In response, the DA-BAFS officially created a TWG to develop the PNS under the Special Order (SO) No. 905, series of 2024 (Addendum to SO No. 305, series of 2024 entitled, “Creation of TWG and Project Management Team [PMT] for the Development of PNS for Agricultural and Fishery Products and Machinery”).

The TWG was composed of relevant stakeholders from the government sector, academe/research institutions, private sector organizations, and Civil Society Organizations (CSO). The draft PNS underwent an extensive series of TWG writeshops and stakeholder consultations, facilitated through physical and online platforms, from May to November 2024 prior to its endorsement to the DA Secretary for approval.

This Standard includes the following significant changes compared to the PAES 102:2000:

1. Modification on the title and scope to specify its applicability to agricultural and biosystems power and machinery;
2. Updating of Terms and Definitions to include additional terminology;
3. Modification of provision for measurements and quantities to be indicated as mandatory requirement; and
4. Updating of provisions for the contents and presentation to align with the current recommendations and interpretations regarding quality and usability of operator's manuals.

This Standard cancels and replaces PAES 102:2000 which has been technically revised. This document was written in accordance with the formatting and editorial rules of the Standardization Guide No. 1 (Writing the PNS) developed by the Standards Development Division (SDD) of the DA-BAFS.

## **Introduction**

In the preparation of this document, consideration has been given to the fact that manuals are expected to be available for operators. Operators need to have a manual, giving guidance for the correct use and maintenance of the machine and its equipment and attachments. The manuals should be clear and easy to understand, include warnings for foreseeable hazards, and ensure that units, symbols, and illustrations align with relevant International Standards. ISO 3600:2022 (Tractors, machinery for agriculture and forestry, powered lawn and garden equipment — Operator's manuals — Content and format) or other applicable standards, can also be used as reference for additional information in drafting the manual.

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## **1 Scope**

This Standard provides guidance for the content and presentation of operator's manual for agricultural and biosystems power and machinery.

## **2 Normative References**

There are no normative references in this document.

## **3 Terms and Definitions**

For the purpose of this Standard, the following definitions shall apply:

### **3.1**

#### **machine**

refers to farm power and machinery for the production, harvesting, processing, storage, manufacture, preserving, transporting and distribution of agricultural and biological products/materials and includes, but is not limited to, tractors and their attachments, power tillers, seeders, transplanters, windmills, harvesting machines, crop protection and maintenance equipment, irrigation equipment and accessories, greenhouses and other thermal conditioning equipment, livestock, poultry, fishery and forest equipment, slaughtering equipment, meat/fishery and crop processing equipment, postharvest machines such as milling machines, dryers, threshers, grain and other strippers, agricultural transport machinery and storage (Philippine Agricultural and Biosystems Engineering Act of 2016, 2016)

*admitted term: agricultural and biosystems power and machinery*

### **3.2**

#### **maintenance**

activities necessary to avoid machine failure, and retain a machine in operable condition (International Organization for Standardization [ISO], 2022)

**NOTE** This would exclude repairs to machine components that are not intended to be replaced on a regular schedule

### **3.3**

#### **Manufacturers, Fabricators, Assemblers, Distributors, Dealers, Importers and/or Exporters (MFADDIE)**

any entity that manufactures, fabricates, assembles, distributes, deals, imports and/or exports agricultural and fishery machinery and its parts (PCAF-DA, 2018)

*admitted term: supplier*

**3.3.1****manufacturer**

any entity that produces agricultural and fishery machinery from conceptualization, prototyping, testing, commissioning, and eventually selling. Usually, a manufacturer produces agricultural machinery and equipment in bulk (BAFE-DA, 2019, *modified*)

**3.3.2****fabricator**

any entity that produces agricultural and fishery machinery from prototyping, testing, commissioning, and selling. Usually, they produce agricultural and fishery machinery depending on the order and arrangement (BAFE-DA, 2019, *modified*)

**3.3.3****assembler**

any entity involved in the assembly using locally-made or imported individual parts and components for the production of agricultural and fishery machinery (BAFE-DA, 2019)

**3.3.4****distributor**

any trading entity authorized by foreign or local suppliers and/or manufacturers to distribute agricultural and fishery machinery to dealers (BAFE-DA, 2019)

**3.3.5****dealer**

authorized representative of distributors and/or manufacturers to supply, trade, sell and service agricultural and fishery machinery to end-user (BAFE-DA, 2019)

**3.3.6****importer**

any entity who brings agricultural and fishery machinery into the Philippines, whether or not made in the course of his trade or business (BAFE-DA, 2019, *modified*)

*admitted terms: indentor, broker*

**3.3.7****exporter**

any entity who ships/sends agricultural and fishery machinery to another country for sale (BAFE-DA, 2019)

**3.4****operator**

authorized person using the machine for the purpose intended by the MFADDIE (ISO, 2022, *modified*)

**3.5****operator's manual**

document that provides information needed by the operator to safely operate and maintain specified machines (ISO, 2022)

**3.6****repair**

activities necessary to restore a machine to operable condition after a failure has occurred (ISO, 2022)

**NOTE** This would exclude repairs to machine components that are not intended to be replaced on a regular schedule

**3.7****replacement part**

single part, multiple parts, or subassembly used to replace a worn or failed part or subassembly (ISO, 2022)

**3.8****service**

activities necessary to repair and install machine components (ISO, 2022 *modified*)

**NOTE** This would excludes repairs those components that are intended to be replaced on a regular schedule

**4 Contents of Operator's Manual****4.1 Identification of manual**

**4.1.1** Any document published in accordance with this Standard shall be identifiable as the relevant manual for a specific machine.

**4.1.2** Each operator's manual shall have its own publication name, number and date of issue.

**4.1.3** Each publication shall identify the following:

- a) the name and address of the manufacturer and/or distributor of the machine, including contact information;
- b) name and address of the importer of the machine (if imported);



- c) brand and model number, and model name or type designation of the machine;
- d) the part number or publication number or printing number by which the manual may be ordered;
- e) publication date; revision level or a publication code that can be used to identify the publication date or revision level of the manual or section; and
- f) the language/s in which the manual is written.

## **4.2 Categories of information**

**4.2.1** This Standard covers all the information that the user of a machine will need. The information in the manual shall be organized in a logical sequence for easy understanding of the operator.

**4.2.2** The safety precautions, controls, and operating instruction shall be provided at the front portion of the manual. The extent of information provided may depend on the type of machine and the operator's needs.

**4.2.3** If the work involved is complex, procedures that are performed only once (for example, initial set-up or installation) may be detailed in a separate publication.

## **4.3 Machine identification**

### **4.3.1 Brand and model designation and number**

This information enables the operator to identify readily the machine to which the operator's manual belongs.

### **4.3.2 Serial numbers**

This information shall enable the operator to locate and identify the serial numbers and/or codes of the major components on the machine.

## **4.4 Introduction**

**4.4.1** The introduction shall provide clarity to the purpose of the manual and its importance to the machine. It shall also provide the reader with any information that will help to understand the manual.

**4.4.2** Each publication should include a statement that directs readers to support options available for further assistance with the publication's content.

**4.4.3** Attention shall be drawn to the use of the safety alert symbol to highlight information about potential dangers to the user.

#### **4.5 Intended use**

This category shall inform the operator of the function for which the machine is designed and, if appropriate, draw attention to ways in which the machine should not be used. If the machine is designed for use in association with other machinery, the information shall state the type of machinery that is suitable for such use.

#### **4.6 Table of contents**

The table of contents shall be provided to identify the main categories of information in the manual and where they can be found. The first number of the first page of each section shall be listed.

#### **4.7 Safety precautions and information**

##### **4.7.1 General**

**4.7.1.1** This category shall draw the operator's attention to potential hazards associated with the use, movement, transport, cleaning, clearing blockages, and maintenance of the machine. Precautions to be taken to minimize or avoid any hazard shall also be stated.

**4.7.1.2** Safety information should also be included in other sections of operator's manual if ever an operating procedure could result in personal injury or damage to machinery if not observed carefully.

##### **4.7.2 Safety signs**

**4.7.2.1** Safety signs that appear on the equipment shall be reproduced in legible size in the operator's manual, either in the appropriate section of the text relative to the point of use, in the safety section, or in a separate safety sign section. Text that explains the meaning of a safety sign should be included in the operator's manual if the safety sign itself does not contain a written message. A safety sign may appear in more than one section of the manual.

**4.7.2.2** Other relevant information about the safety signs shall include:

- a) Information on the location of each safety sign on the machine;
- b) Instructions on the need to keep safety signs clear and visible on the machine;
- c) Instructions to replace safety signs if they are missing or illegible;
- d) Instructions that new equipment components installed during repair shall include the current safety signs and shall be affixed on the replacement component; and
- e) Instructions detailing the process to obtain replacement safety signs.

### **4.7.3 Hazards**

This category shall indicate any known hazards related to the use of the machine, including any restrictions on the operation such as the use of an unauthorized person.

## **4.8 Specifications**

**4.8.1** This category shall include all relevant dimensions and technical data (e.g., input capacity, rated capacity, and power requirement) necessary to assist the operator achieve an optimum operational performance and reliability. If applicable, the relevant national or International Standards to which the machine or its component parts have been built should be stated.

**4.8.2** If two or more machines are linked to form a system in which their functioning is interdependent, the technical specifications of the linkage should be provided.

## **4.9 Operating information**

This category shall provide the operator with logical instructions for the effective operation of the machinery (e.g., continuous operating time and recommended rest time). Operating information should include the general specifications and description of the machine, identification of controls, and instructions for proper operation of the machine. If applicable, a performance curve shall be provided.

## **4.10 Troubleshooting information**

This category shall indicate the systematic approach in troubleshooting the machine in cases of minor breakdowns or malfunction.

## **4.11 Accessories and attachments**

This category shall inform the operator of any choice of accessories and attachments as specified and authorized by the manufacturer and how these choices affect the safety, operation, and maintenance of the machine.

## **4.12 Maintenance instructions**

### **4.12.1 General**

**4.12.1.1** The maintenance instructions should be divided into logical groups appropriate to the machine such as checks, inspections, and tests; other routine maintenance tasks; and basic troubleshooting.

**4.12.1.2** The manual should be confined to maintenance tasks within the capability of the operator. Such tasks may include cleaning, clearing blockages, replenishment, lubrication, external visual examination, simple tests, and correction of minor issues.

**4.12.1.3** The manufacturers shall consider the maintenance work necessary to keep the machine in good condition as designed and plan as to which information is to be included in the operator's manual and which information is more suited to a workshop or technical manual.

#### **4.12.2 Maintenance schedules**

If maintenance tasks are required to be carried out at specific intervals (e.g., time, distance, running hours, completed operations) they should be summarized in tabular form with further details, if necessary, in the text. If the maintenance schedules vary according to individual conditions of operation (e.g., checking and replenishing coolant), this should be stated.

#### **4.12.3 Specialized tasks**

If maintenance tasks require specialist knowledge of an operator or specialized tools or resources recommended by the manufacturer, this shall be stated. If any work carried out by an operator would affect the warranty of the machine, this shall also be stated.

#### **4.12.4 Details of maintenance work**

The instructions for each task shall include details of dismantling and reassembly procedures and identification of replacement parts, materials, tools, test equipment and services required. The warnings of the possible hazards and information about safety precautions shall be given. For example, if a ballasted rear wheel is to be removed from a tractor, there is a potential stability hazard both during removal and subsequent temporary storage; the manual shall identify this potential hazard and give instructions for safe removal of the wheel and its temporary storage.

#### **4.12.5 Tools, equipment, and instruments**

The manual shall be provided with a section for the recommended tools, equipment and instruments as specified by the manufacturer for the repair and maintenance of the machine.

### **4.13 Storage**

**4.13.1** This category shall provide the operator with instructions and information, including precautions to be taken and any tools or special equipment required, to prepare the machinery for storage.

**4.13.2** A list of storage requirements shall be provided, including information about supplies and services needed, periodic inspections, tests, limitations on storage life, etc.

**4.13.3** Procedures for the preparation of the machine prior to the operation after storage should also be given.

#### **4.14 Handling during reception, transportation, assembly and installation**

##### **4.14.1 General**

**4.14.1.1** This category shall contain technical information and instructions for handling, reception, transportation, assembly, installation, and initial set-up of the machinery (unless this will be carried out by the dealer).

**4.14.1.2** It shall also describe machine disassembly for transport and subsequent reinstallation in another location or different environment, if the disassembly process is simple, clear instructions should still be provided to ensure proper reassembly.

**4.14.1.3** Information on handling, reception, transportation, assembly, and installation should either be contained in a separate publication or included in the operator's manual. A separate publication is usually appropriate for more complex machines.

##### **4.14.2 Reception**

Unpacking instructions should be given and attention drawn to any specific points that need care or special treatment, unless this will be carried out by the dealer. Lifting points, slings, spreaders, etc. should be specified.

##### **4.14.3 Transportation**

**4.14.3.1** Instructions for preparing the machinery for transportation, including precautions and information about the tools required, shall be included. A list of requirements shall be provided and procedures for preparing the machine for use after transportation should be given.

**4.14.3.2** List of applicable vehicles for the transport of the machinery shall be indicated as specified by the manufacturers.

##### **4.14.4 Installation**

Detailed instructions shall be given about the operations necessary to install the machine and to bring it to full working condition. If necessary, reference shall be made to performance specifications and to acceptance inspection and testing. Externally provided services (e.g., air, electricity, gas, water, and

fuel) shall be specified. Detailed methods of connecting the component of the machinery shall be provided. Precautions that must be taken before connecting services shall be emphasized.

#### **4.14.5 Initial set-up**

Procedures for the initial set-up of the machine should be detailed in full. Any special tools or testing and calibration equipment should be listed.

#### **4.14.6 Environment**

The required environment for handling, installation, and storage shall be stated.

#### **4.14.7 Hazards**

Specific notes on hazards and safety precautions shall be included where appropriate. If applicable, information on fire prevention and chemical or other contamination shall be included.

#### **4.15 Dismantling and disposal**

**4.15.1** This category shall inform the operator of the action to be taken on the completion of the useful life or its parts, with instructions on dismantling and disposal. Warnings of any hazards and safety precautions to be taken during dismantling and disposal, shall also be indicated.

**4.15.2** The entity responsible for facilitating the disposal of the machinery as specified by the manufacturer shall be indicated.

#### **4.16 Warranty**

This category should explicitly state the terms and conditions of the warranty, including a comprehensive list of actions or modifications that could void the warranty. This section should offer clear instructions on how to obtain the warranty certificate and where to access additional warranty details. If the warranty details are not available in the manual, an equivalent document (e.g., warranty guidebook) shall be provided.

#### **4.17 Alphabetical index**

A manual with more than 32 pages should have an alphabetical index placed at the last portion of the manual. An alphabetical index should include all major topics covered by the manual and should indicate the page number where the indexed information is located.

#### **4.18 Parts list**

- 4.18.1** If there is no separate parts list or catalogue exists, a parts list shall be included within the operator's manual. If included, a parts list shall contain sufficient information (such as part number and description) for each item so that the correct replacement part can be obtained. Sources or suppliers for available replacement parts shall be indicated. Ratings, dimensions, and recognized standards shall be quoted for items such as bolts, nuts, seals, and O-rings.
- 4.18.2** Parts lists shall indicate those replacement assemblies, and parts which the operator is expected to identify. Parts lists shall be illustrated, if applicable, or refer to suitable illustrations elsewhere, so that each item can be located. If it is impossible or inadvisable to dismantle an assembly or to replace an individual part of an assembly, the component parts shall not be listed.
- 4.18.3** Detailed schematics, proprietary manufacturing details, and other parts that are not intended for user replacement should be included in this section.

### **5 Presentation of Operator's Manual**

#### **5.1 General considerations**

This clause provides guidance on presentation which may be applicable to the operator's manual.

##### **5.1.1 Paper size**

- 5.1.1.1** The manual should be printed in an A5 size (148.5 mm x 210 mm) as it is suitable for most cases.
- 5.1.1.2** In case of a complex machine, A4 size (210 mm x 297 mm) may be used to allow coverage with an acceptable number of pages. Also, it is suitable for static equipment which do not require storage.
- 5.1.1.3** In case of a simpler machine,  $\frac{1}{3}$  A4 size (99 mm x 210) may be used as it is sufficient for conveying necessary information clearly.

##### **5.1.2 Protection**

For initial shipment, the manual should be sealed inside a transparent water- and-oil-resistant package (e.g., envelope, pouch, and plastic bag with zip lock).

### **5.1.3 Front cover**

The front cover should be made from a stiff, durable material, and be the same size as the pages of the manual. A cover of greater stiffness than the pages is generally appropriate, although a paper cover of the same stiffness as the pages is acceptable for small manuals.

### **5.1.4 Rear cover**

The rear cover should be of the same material and size as the front cover. If appropriate, there should be a pocket in the inside cover to keep a separate parts list.

### **5.1.5 Binding**

Any type of binding which provides substantial anchorage for the pages, while allowing the text to be accessed without damage, shall be used.

### **5.1.6 Divider leaves**

Major subjects or categories of information may be conveniently indicated for quick reference using divider leaves, which should be an ordinary card or the same paper in a different color.

### **5.1.7 Notes**

There should be one or two blank pages at the back of the manual for notes on individual conditions.

## **5.2 Presentation of the text**

### **5.2.1 General**

**5.2.1.1** The manual should be written in clear, concise language easily understood by the intended operator. Manuals shall be available in English and may be translated into local language/s applicable to the area where the machine is sold.

**5.2.1.2** If the manufacturer presents instructions concurrently in more than one language, the number of languages should be restricted to allow easy use of the manual. The number of languages to be presented depends upon the complexity of the machine. More complex machines should use fewer languages. Manuals may be translated to different local languages.



### **5.2.2 Author**

The author should be generally conversant with agriculture and engineering but need not be an expert on the machine in question. They should have some knowledge of technical writing principles. It is also useful if the author has operated the machine or is otherwise familiar with its operation.

### **5.2.3 Level of text**

In developing the text, it should be assumed that the reader (operator) has limited prior knowledge of the machine and its operation.

### **5.2.4 Style of text**

Text and sentences should be direct and concise. Accepted grammar and usage should be maintained. References to time intervals should be specific. Paragraphs should be short and relate to one topic only.

### **5.2.5 Checking**

The manual should be carefully checked for typographical errors, technical accuracy, and ease of understanding.

## **5.3 Typographical design**

### **5.3.1 General**

Page layout should be designed for easy reading. Line length and type size should be interrelated.

### **5.3.2 Paper**

The paper should be good quality white paper that is sufficiently opaque to prevent information printed on one side of the sheet from making information printed on the other side difficult to read.

### **5.3.3 Color**

If colored paper is used, the contrast between the paper and the ink should not be appreciably less than that provided by black ink on white paper. If colored inks are used, consideration should be given to the relationship with the color of the paper, the increased cost, and the effect on methods of reproduction.

### **5.3.4 Reproduction**

Reproduction copies should be produced by digital printing, inkjet printing and other applicable printing methods that are high-quality with dense and sharp images and text.

### **5.3.5 Type size**

The type size of the main text should be 10 points or greater. Smaller type sizes can be appropriate for manuals on A5 (148.5 mm x 210 mm) or smaller paper size.

### **5.3.6 Margins**

The margins should be wide enough to allow for binding. Inner margins (left-hand on odd-numbered pages, right-hand on even-numbered pages) should be 10 mm to 15 mm to allow clear readability if the bound manual is open. Outer margins (right-hand on odd-numbered pages, left-hand on even-numbered pages) should be sufficient (6 mm to 10 mm) to ensure that page content is not cut during the printing and binding process. Top and bottom margins should be equal to inner margins.

### **5.3.7 Columns**

The information on A4 (210 mm x 297 mm) or larger paper size should be presented in two columns, while information on A5 (148.5 mm x 210 mm) or smaller paper size should be presented in a single column.

### **5.3.8 Headings**

The headings should be used consistently throughout the manual to provide a systematic method of presentation. Headings should be in larger type size than the text and in a bolder typeface or an alternative color. The number of levels should be kept to a minimum.

## **5.4 Text conventions**

### **5.4.1 General**

Consistent forms of language, spelling, numbering, symbols, etc. shall be used throughout the manual.

### **5.4.2 Terminology**

Terminology should be consistent throughout the manual. Names and part numbers shall be used consistently in all technical information. Technical

terms that require specialized knowledge should be avoided except if no other terms convey the intended meaning.

### **5.4.3 Glossaries, abbreviations, signs and symbols**

**5.4.3.1** If a manual uses an appreciable number of words, phrases, or abbreviations that may be unfamiliar to the reader, a glossary should be provided or reference made to appropriate documents. Alternatively, if only a small number of terms are used, explanatory notes may accompany the first use of each term, either in parentheses (round brackets) or as a footnote.

**5.4.3.2** Glossaries should explain words or phrases that may be unfamiliar to the reader and need specialized knowledge.

**5.4.3.3** Abbreviations should not be used unless a list of those used, together with their meanings, is included. Abbreviations should terminate in a full stop.

**5.4.3.4** Symbols for units of measurement shall remain the same in both singular and plural forms and shall not be followed by a full stop except at the end of a sentence.

### **5.4.4 Upper case letters**

Words in uppercase letters should be used sparingly. It is usually better to use bold lowercase letters to emphasize key words or phrases. When referring to controls which have identifying titles on them (for example, STOP control) then upper-case letters can be used.

### **5.4.5 Spelling**

Spelling should conform to standard practice for the language in which the manual is published and should be consistent throughout the manual.

### **5.4.6 Measurements and quantities**

All measurements and quantities shall be expressed in the International System of units (SI units). If appropriate, it should be followed by the equivalent in customary units in parentheses.

### **5.4.7 Numbers**

**5.4.7.1** All numbers shall be written in Arabic numerals. The only exception is if a sentence starts with a number; in such cases, the sentence should be reordered to move the number from the beginning of the sentence, or, if this proves impossible, the number may be expressed in words.

**5.4.7.2** Numbers consisting of more than four digits (except dates) should be shown in groups of three, counting from the decimal marker to the left: for example, 21 000. This practice will prevent confusion in areas where a comma is used as a decimal marker.

#### **5.4.8 Left-hand and right-hand**

Left-hand and right-hand should not be abbreviated in the text, except in charts. For static or unusual equipment, these terms should be defined. Clockwise and counterclockwise require an explanation of the direction of view.

### **5.5 Illustrations**

#### **5.5.1 General**

**5.5.1.1** Illustrations should be user-friendly in presenting technical information. If a manual is likely to be translated into a foreign language, it is important that no words should appear on the illustrations. Numbers, letters or symbols on the illustration should be used, with an explanation for each number, letter or symbol used in the text of the manual.

**5.5.1.2** Illustrations should be provided with a descriptive caption. Illustrations should be as simple as possible with no unnecessary information.

#### **5.5.2 Position**

Illustrations in the body of the text should be either adjacent, or as close as possible, to the related text. If repeated reference to a diagram is made from different parts of the text, consideration should be given to the use of a foldout diagram. If possible, illustrations should be presented in portrait format for easy reading. If, because of its size, an illustration is presented in landscape format, then the top of the illustration should be on the left side of the page.

#### **5.5.3 Use of color**

Color should be used only if it is necessary to clarify complicated diagrams or to illustrate actual machine displays. Techniques such as shading, cross-hatching, and screening should be used in preference to color. If color is used, primary colors are preferable, while avoiding the use of red and green in combination. If black-and-white illustrations in a manual appear in colored form elsewhere (for example, in colored wall charts or transparencies) the manual should make use of distinctive shading patterns to delineate the different colors consistently.

#### **5.5.4 Limitations of color**

Color blindness, microfilming, photocopying, possible confusion of colors when seen in poor or colored light, cost and difficulties of reproduction should be taken into account if the possibility of using color is considered. These considerations apply particularly to safety notices.

#### **5.5.5 Clarity**

Simple line illustrations or good quality photographs provide the best clarity of reproduction. Shading should be used only if it contributes to the information given in the drawing; decorative shading should be avoided.

#### **5.5.6 Scale**

If an indication of scale is required, it should be given in a form which is independent of the reproduced size of the drawing. It should indicate scale by including in the illustration a ruled measure or some object of known size.

#### **5.5.7 Text and illustrations balance**

**5.5.7.1** Illustrations and text should complement each other and should be prepared together to shorten and simplify the subject matter. Illustrations should always appear adjacent to the related text.

**5.5.7.2** A modular approach may be used which links text and illustrations closely together in logical blocks, groups, or modules, each covering one topic.

#### **5.5.8 Charts**

Information, which is required frequently, or which is easier to explain in flow form should be presented in charts. These should be accompanied by a glossary of abbreviations, symbols, and any unfamiliar terms.

#### **5.5.9 Tables**

Tables should be presented with the minimum number of lines required for clarity. Tables should preferably appear at the appropriate point in the body of the text. Alternatively, tables may be collected together at the end of the relevant text or form a separate supplementary document. A title and number shall be provided for each table.

## **5.6 Instructions**

### **5.6.1 General**

Instructions identified as **WARNING**, **CAUTION**, and **IMPORTANT** shall be used to emphasize important points in the manual. **WARNING** and **CAUTION** shall be used for safety-related information where personal injury may be involved. **IMPORTANT** shall be used for instructions if machine damage is involved. **NOTE** is used for supplementary information.

### **5.6.2 Warning and Caution**

**5.6.2.1** Instructions identified as **WARNING** and **CAUTION** shall emphasize important safety points where personal injury may be involved. These instructions need to be followed precisely to avoid hazardous situations. Specifically, **WARNING** shall be used to highlight that if a warning is not heeded, it can cause death or serious injury. **CAUTION** shall be used to emphasize that if precaution is not taken into consideration, it may cause minor or moderate injury.

**5.6.2.2** **WARNING** and **CAUTION** instructions should be placed immediately before the text to which they apply and should be signaled in the left-hand margin by the safety alert symbol. These instructions should be placed in prominent positions that relate directly to any illustrations to which they apply. The appropriate heading should always be included and set in bold upper-case type.

### **5.6.3 Important**

**5.6.3.1** Instructions identified as **IMPORTANT** are instructions which shall be followed precisely to avoid damaging the product, process, or its surroundings.

**5.6.3.2** These instructions should be worded or located to indicate their point of application and should be set to the same measure (column or page width) as the related text. The heading should always be included and set in bold type.

## **5.7 Numbering of pages, figures and tables**

### **5.7.1 General**

Arabic numerals should normally be used for all numbering of pages, figures, and tables within the manual. Roman numerals may be used in conventional instances, such as front matter or major section outlines. Blocks of text (such as clauses and subclauses, divisions and subdivisions, or paragraphs and subparagraphs) may also be numbered.

### **5.7.2 Page numbering**

Page numbers should be visually separate from the text. The numbering system should be designed to make selection of the correct page as simple as possible. In short manuals, pages should be numbered consecutively throughout the manual. In long manuals, pages should be numbered consecutively within each main division. It may be helpful to identify pages by the number of the main division followed by a hyphen and then the page number: for example, "Page 7-12" is the twelfth page of section.

### **5.7.3 Numbering of figures and tables**

Figures, tables, and other non-textual material should be cross-referenced to the corresponding text to eliminate confusion. If such cross-referencing cannot be achieved, figures and tables should be numbered consecutively in the same manner as pages. In other words, if each section is page-numbered separately, the first figure in section 1 should be "Figure 1-1"; the third figure in section 2 should be "Figure 2-3", and so on. Figure and table numbers should have a prefix ("Figure" or "Table") to distinguish them from page numbers.

## **5.8 References**

Different sequences of numbering should be used for footnotes and for references cited in the text: for example, letters or symbols for one and numerals for the other. Reference numberings, letters, and symbols should be printed as superscripts or, if on the line, in parentheses or square brackets immediately following the relevant word or phrase in the text.

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**Department of Agriculture (DA)  
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**Technical Working Group (TWG) for the Philippine National Standard (PNS) on  
Operator's Manual for Agricultural and Biosystems Power and Machinery —  
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