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CHAPTER 6 STANDARDS

Chapter 6

STANDARDS

- At the end of this chapter, students should be able to
 - **discuss the benefits of standardization, the elements and categories of standards and how standards are developed**

6.0 Standards

Contents

- 6.1 What are Standards?
- 6.2 Benefits of Standardization
- 6.3 Elements of a Standard
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6.1 What are Standards?

6.1 What are Standards

- **A standard is a formal document issued by an organization for the purpose of defining an overall level of acceptance on a subject matter**
- The subject matter can be in any form that can be standardized by observation and/or **measurement** of its attributes

6.1 What are Standards

- The requirements of the standard would account for the relevant criteria and characteristics of the intended product or services which may include:
 - **Physical properties**
 - **Test requirements**
 - **Performance criteria**
 - **Other intrinsic or regulatory requirements**

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6.2 Benefits of Standardization

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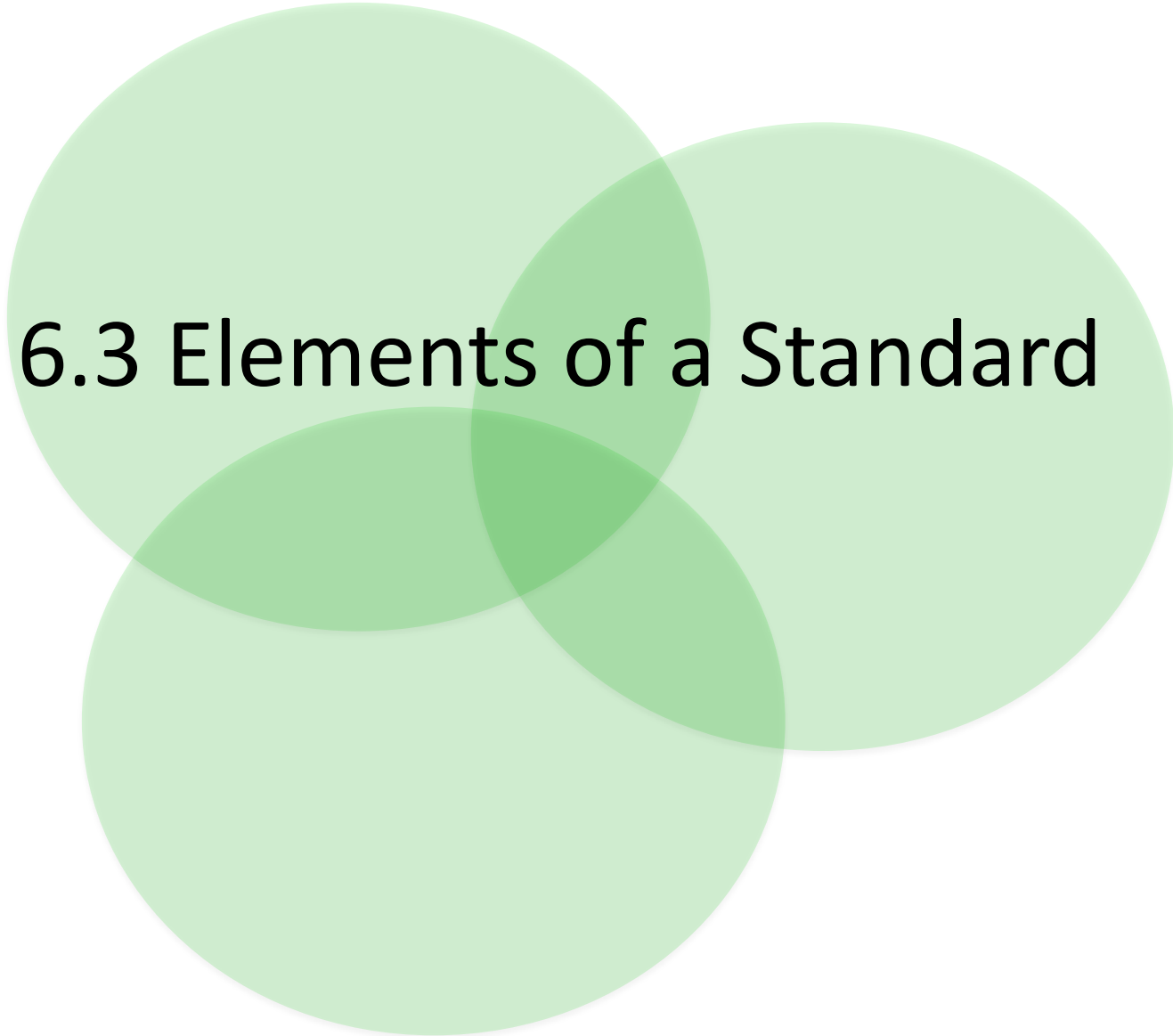
- Product standards provide clear targets on minimum requirements to be achieved for goods and services, improve communication within the supply chain and promote a fair and equitable business environment
- **Work standards establish consistent methods and best practices to be maintained, enhancing repeatability and reproducibility of results and quality of work, and providing the means for regulated step improvements**

6.2 Benefits of Standardization

- Management standards promote orderly systems within business processes with emphasis on measurable improvements to be made on aspects of quality, health and safety which provide for more conducive working environments
- **Standards allow for a good measure of certainty and expectation for consumers and an opportunity for a wider selection of goods and services from an increased supply network**

6.2 Benefits of Standardization

- Standards provide a basis for legislation on general accountability in conducting business and on matters pertaining to product quality, occupational health & safety, environmental and consumer protection
- **Standards facilitate product compatibility, interchangeability and inter-operability which encourage global trade via import substitutions and export promotions**

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6.3 Elements of a Standard

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- A standard is firstly identified by a **Standard Number** which consists of the abbreviation of the Standards Body (**e.g. MS for Malaysian Standard by The Department of Standards Malaysia**) and a unique identification number, and a **Standard Title** which briefly describes the subject matter of the document

6.3 Elements of a Standard

- The **Foreword** or **Preface** of the standard provides some background information on the origin of the document such as the source of information and the organizations involved in its review and publication
- In the case of a revised standard, the major amendments arising from the previous version are listed and explained in brief

6.3 Elements of a Standard

- The **Scope** is an important element of the standard in which the subject matter is described in further detail on its manner and level of application
- Information may also include specific conditions in which the standard will not be applicable
- A list of **Definitions** may be included for exclusive words or abbreviations used which may differ from other standards

6.3 Elements of a Standard

- A **Reference** list of other standards may be included as informative or pertinent documents to be used in conjunction with the standard
- The **Content** or **Requirement** is the main body of the document which provides the relevant information towards compliance to the standard
- These requirements may be described under the headings of further sub-elements which are arranged in a manner appropriate to the subject matter

6.3 Elements of a Standard

- In the most common form of a product standard, the requirements are elaborated under sub-clauses in an orderly manner based on the design, development or manufacture of the product
- Under these sub-clauses, the specifics of each requirement would be provided with clarity in its greatest detail
- Each standard or level of acceptance is usually determined by applicable test methods via observation or measurements, hence forming the basis of **Specifications** for the standard

6.3 Elements of a Standard

- For ease of referencing of more elaborate designs or complex items, Tables and/or Drawings are normally included within the sub-clauses or as **Appendices**
- Other elements relevant to compliance to the standard may include details on product marking and guidelines on product certification by a body certified by the standard

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6.4 Category of Standards

6.4 Category of Standards

- In its most basic form a standard is **informative** in nature, with its usual declaration in the foreword as a **voluntary** document which essentially absolves the issuing body of any responsibility arising from its use
- A **reference** standard would suggest a similar connotation while an **official** standard may carry a heavier significance on its use

6.4 Category of Standards

- Standards which are declared **mandatory** would include a statement on its specific use or on conditions where obligatory requirements are applicable
- A **draft** standard means that the document has yet to be formally approved for use and its informal status is usually indicated

6.4 Category of Standards

- A **revised** standard indicates that an amendment has been made on a previous standard, now deemed an **obsolete** standard
- The previous standard however may still be allowed to be in use within a period of time as determined by the standard body. Beyond the stipulated period, the standard will be **withdrawn**

6.4 Category of Standards

- A **high-level** standard by definition would cover the major aspects of a subject which would include the specific requirements pertinent to achieving the overall aim of compliance
- The document would make reference to other **supporting** documents in the form of standards on test methods, graphs or tables

6.4.1 Product Standards

- Product Standards are the most common form of standards covering a wide spectrum of manufactured products
- These standards would provide the necessary details or specifications in ensuring products are manufactured to declared limits which usually include its physical properties, tests and acceptance levels, and guidelines in determining final product compliance

6.4.1 Product Standards

- The standards are published by organizations relevant to the industry with the specific interest of ensuring all products that fall within the scope of compliance are designed and constructed to the level of the standard

6.4.1 Product Standards

- Product standards of national concern may be issued by national standard bodies for use within the country. These may in turn be regulated by law in ensuring a high level of conformity for products of public interest such as in matters of security, health & safety and environmental concerns

6.4.1 Product Standards

- Similarly in a wider context, international product standards extend the necessity for global product compliance to facilitate the trading, transfer and use of the product between nations
- Buyers in turn would be exposed to a wider range of similar products from other countries with an enhanced level of certainty that these products would continue to meet customer expectations

6.4.1 Product Standards

- *Examples of product standards:*
 - *MS 281 : 1998. Specification for natural rubber latex concentrate :*
 - *MS 2120 : 2009 Electrical Cable : 19/33 (36) kV Three Core XLPE Insulated Cable – Armoured*
 - *ANSI A50.3 Cold-drawn steel wire for concrete reinforcement*
 - *ISO 65:1981 Carbon steel tubes suitable for screwing in accordance with ISO 7-1*
 - *IEC 60745-2-12 : 2003 Hand-held motor operated electric tools – safety – part 2-12 : particular requirements for concrete vibrators*

6.4.2 Work Standards

- Work standards provide details for specific tasks or scope of work
- By definition these standards are specific to the subject matter and forms the basis for determining the level of completion, compliance or competency of work which may appropriately be checked or formally assessed

6.4.2 Work Standards

- The standards are usually published by organizations with the necessary level of expertise such as professional bodies with the interest of ensuring common work standards are maintained
- In general, the main body of the standard would be an orderly and detailed description of steps, stages and procedures including applicable tests and qualification methods

6.4.2 Work Standards

- For the same reason as for selective product standards, Work Standards such as the professional Codes of Practices may be extended at national and/or international levels where conformity on a wider scale is deemed critical for security and safety reasons

6.4.2 Work Standards

- Examples of work standards:
 - *MS 1525:2001 Code of practice on energy efficiency and use of renewables for non-residential buildings*
 - *IEC 60079 Electrical Installations in Hazardous Areas*
 - *BS 7925-2 Software component testing standard*
 - *ANSI A41.2 Building code requirements for reinforced masonry*
 - *ASME PCC-2-2010 Repair of pressure equipment and piping*
 - *ASME OM-2009 Operation and maintenance of nuclear power plants*

6.4.3 Management Standards

- **Management Standards stipulate guidelines on a wide range of pertinent operational and business processes to be controlled, maintained and improved towards achieving specific objective(s) set forth by an organization**
- The standards are historically published by International Standard Bodies to facilitate the assessment of organizations on general management systems deemed essential for global trade and services

6.4.3 Management Standards

- Subject matters include quality, health, safety and environmental systems
- Organizations which claim conformance to these standards would normally be subjected to periodic surveillance and re-certification by independent assessment bodies which may be regulated at national or international levels

6.4.3 Management Standards

- Examples of management series of standards:
 - *ISO 22000 : 2000 International Food Safety Management Standard.*
 - *ISO 50001:2011 International Standard for Energy Management*
 - *ISO 9001:2008 Quality management systems*
 - *ISO14001:2004 Environmental management systems*
 - *OHSAS 18001:2007 International Occupational Health and Safety Management*

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6.5 Standard Bodies

6.5 Standard Bodies

- Standards are issued by Standard Bodies which are organizations established by recognition or by act of law
- The functions, responsibilities and extent of control in standard activities would vary according to the type of organization and any external regulations that may be applicable

6.5 Standard Bodies

6.5.1 Industry Associations / Societies

- These Standard Bodies comprise of members related to a particular industry or profession, collectively working towards the objective of maintaining a certain level of commonality or standard on Codes of Practices or of supplied or manufactured products and of rendered or applied services

6.5 Standard Bodies

6.5.1 Industry Associations / Societies

- **IEEE** *Institute of Electrical and Electronics Engineers*
- *AEIC Association of Edison Illuminating Companies*
- **ASME** *American Society of Mechanical Engineers*
- *ASCE American Society of Civil Engineers*
- *NEMA National Electrical Manufacturers' Association*
- **SAE** *Society of Automotive Engineers – International*
- *EEMUA Engineering Equipment and Materials Users' Assoc*
- *SMPTE Society of Motion Picture and Television Engineers*
- *ASES American Society of Engineering Societies*
- *CIGRE International Council on Large Electric Systems*

6.5 Standard Bodies

6.5.2 National Standards Bodies

- By definition, National Standards Bodies are managed at national level and governed by act of law or regulations that prescribed the national policies related to the controlled publication and use of National Standards
- These Bodies are at the highest level comprising of mainly relevant government agencies and selective national organizations which translates the policies into strategies and objectives on standards development for the nation

6.5 Standard Bodies

6.5.2 National Standards Bodies

- It is also the highest body of authority in approving national standards submitted by the Standard Committees under its auspices or through a common agency or entity under which the general management of standards activities are delegated

6.5 Standard Bodies

6.5.2 National Standards Bodies

- *MS* *Department of Standards Malaysia*
- *BS* *British Standard Institution*
- *AS/NZS* *Standards Australia / New Zealand*
- *DIN* *Deutsches Institut für Normung*
- *JIS* *Japanese Industrial Standards Committee*
- *ANSI* *American National Standards Institute*
- *SABS* *South African Bureau of Standards*
- *AENOR* *Asociación Española de Normalización y Certificación*
- *UNI* *Ente Nazionale Italiano di Unificazione*
- *NEN* *Nederlands Normalisatie-Instituut*
- *AFNOR* *Association Française de Normalisation*
- *EDF* *Electricité de France*

6.5 Standard Bodies

6.5.3 International Standards Organisations Bodies

- Standards Bodies at the international level are historically initiated and managed collectively by voluntary members of professional and industrial bodies from a multitude of nations with the objective of documenting their consensus on matters of common interest
- With the increasing importance of international standards on global trading and trade agreements, international standards development activities have become a matter of national interest for most nations

6.5 Standard Bodies

6.5.3 International Standards Organisations Bodies

- **IEC The International Electrotechnical Commission (1906)** - is a not-for-profit, non-governmental international standards organization that prepares and publishes International Standards for all electrical, electronic and related technologies – collectively known as "electrotechnology"
- **CIE Commission internationale de l'éclairage (1931)**-is the international authority on light, illumination, color and color spaces

6.5 Standard Bodies

6.5.3 International Standards Organisations Bodies

- **ISO** The International Organization for Standardization (1947) - is an international-standard-setting body composed of representatives from various national standards organizations. Founded on 23 February 1947, the organization promulgates worldwide proprietary industrial and commercial standards. It is headquartered in Geneva, Switzerland
- While ISO defines itself as a non-governmental organization, its ability to set standards that often become law, either through treaties or national standards, makes it more powerful than most non-governmental organizations. In practice, ISO acts as a consortium with strong links to governments

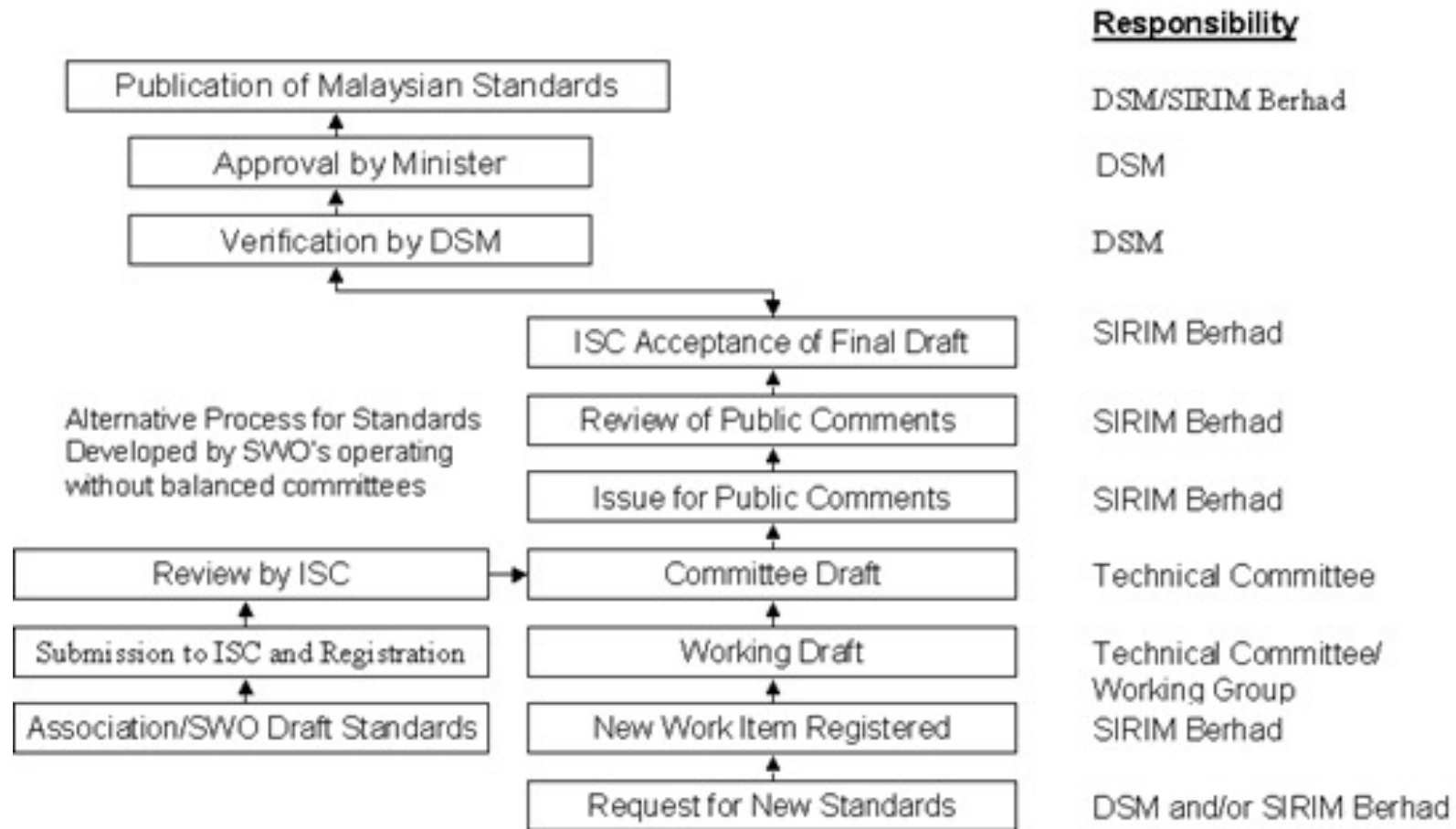


6.6 Standards Development in Malaysia

6.6 Standard Development in Malaysia

- The development of standards in Malaysia consists of a regiment of activities with specific responsibilities placed under select agencies and committees

6.6 Standard Development in Malaysia



ISC : Industry Standards Committee

6.6 Standard Development in Malaysia

6.6.1 Department of Standards Malaysia

- The Department of Standards Malaysia (DSM), under the Ministry of Science, Technology and Innovation (MOSTI) is the Standards Body in Malaysia, governed by the Standards of Malaysia Act 1996 (Act 549)
- Under the department, the Malaysian Standards and Accreditation Council was established to formulate the policies, strategies and programs on the development and promotion of standards in Malaysia
- The activities relating to these formulations are managed by SIRIM Berhad as the appointed national standards development agency

6.6 Standard Development in Malaysia

6.6.2 SIRIM Berhad

- Formerly known as The Standards and Industry Research Institute of Malaysia, SIRIM Berhad regulates the development of Malaysian Standards (MS) through Industry Standards Committees (ISC) of various economic or industry sectors

6.6 Standard Development in Malaysia

Industry Standard Committees

- *ISC/A* *Agriculture*
- *ISC/B* *Chemical and Materials*
- *ISC/D* *Building, Construction and Civil Engineering*
- *ISC/E* *Electrotechnical*
- *ISC/F* *Mechanical Engineering*
- *ISC/G* *Information Technology, Telecommunication and Multimedia*
- *ISC/H* *Petroleum and Gas*
- ***ISC/I*** ***Halal Standards***
- *ISC/J* *Plastics and Plastics Products*
- *ISC/K* *Packaging and Distribution*
- *ISC/L* *Road Vehicles*
- *ISC/M* *Fire Safety and Prevention*
- *ISC/N* *Rubber and Rubber Products*

6.6 Standard Development in Malaysia

Industry Standard Committees

- *ISC/O* *Organisational Management*
- *ISC/P* *Iron and Steel*
- *ISC/Q* *Textiles and Apparels*
- *ISC/R* *Medical Devices and Facilities for Healthcare*
- *ISC/S* *Electrotechnical (2)*
- *ISC/T* *Tourism, Exhibition and Hospitality Services*
- *ISC/U* *Food and Food Products*
- *ISC/W* *Occupational Health and Safety*
- *ISC/X* *Nil*
- *ISC/Y* *Quality Management and Quality Assurance*
- *ISC/Z* *Environmental Management*

6.6 Standard Development in Malaysia

6.6.3 Technical Committees (TC) & Standards Writing Organizations (SWO)

- Under each ISC, Technical Committees (TC) are formed by members of the relevant industry sectors or stakeholders which are formally elected individuals or representatives of the industry organizations
- Members from the academia, consumer associations and select government agencies are usually admitted as members to provide for sufficient coverage in detail and expertise for the development of the standards

6.6 Standard Development in Malaysia

6.6.3 Technical Committees (TC) & Standards Writing Organizations (SWO)

- To further enhance the writing of standards, several large industry and public sector organizations have been appointed as Standard Writing Organisations (SWO) at the same level of Technical Committee, reporting to the ISC

6.6 Standard Development in Malaysia

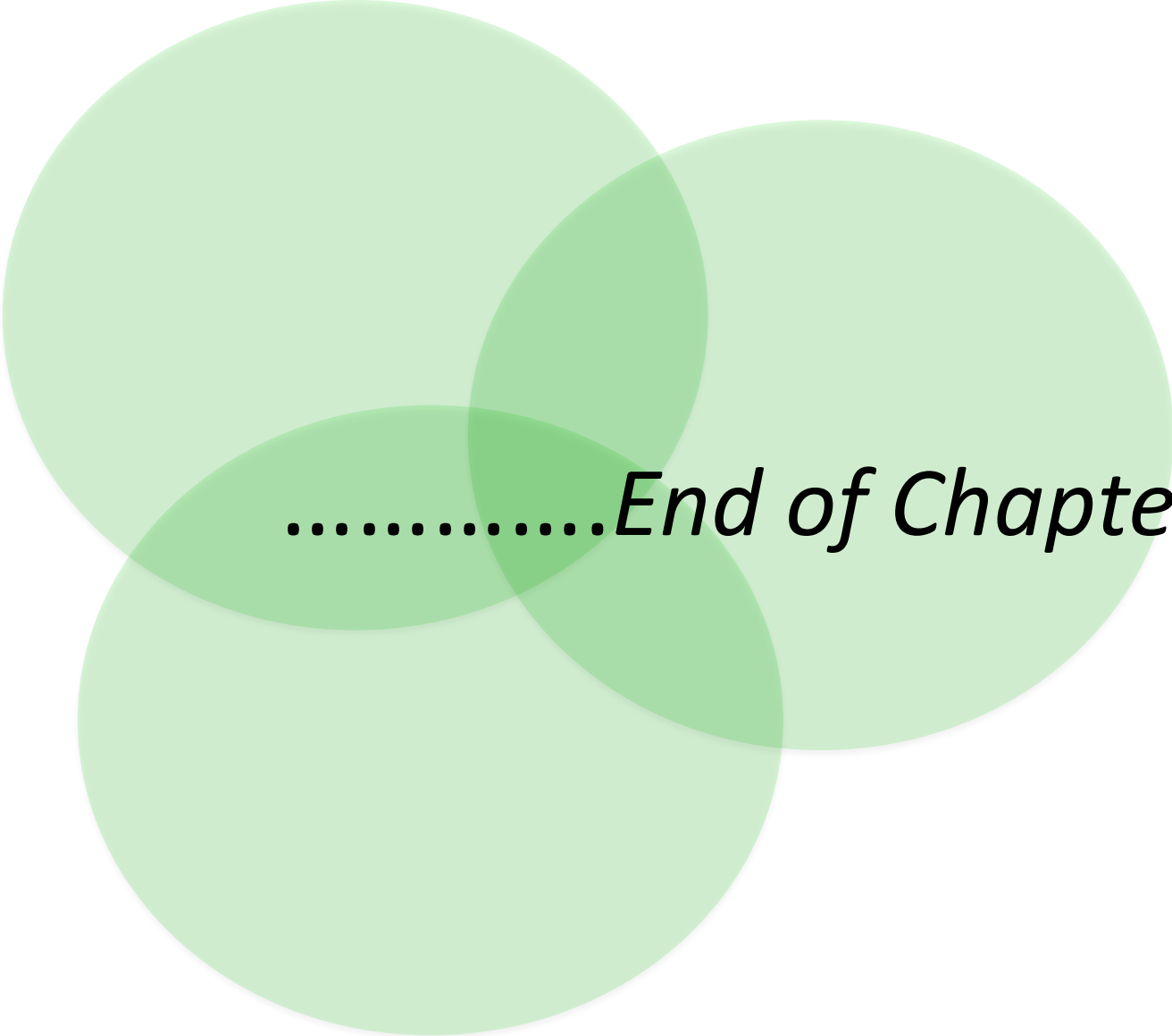
6.6.3 Technical Committees (TC) & Standards Writing Organizations (SWO)

- *MALAYSIAN PLASTICS MANUFACTURER ASSOCIATION*
- *CEMENT AND CONCRETE ASSOCIATION*
- *MALAYSIAN RUBBER BOARD*
- *MALAYSIAN PALM OIL BOARD*
- *CONSTRUCTION INDUSTRY DEVELOPMENT BOARD MALAYSIA (CIDB)*
- *MALAYSIAN ELECTRIC CABLE & WIRES ASSOCIATION*
- *THE MALAYSIAN TIMBER INDUSTRY BOARD (MTIB)*

6.6 Standard Development in Malaysia

6.6.3 Technical Committees (TC) & Standards Writing Organizations (SWO)

- *THE ELECTRICAL AND ELECTRONICS ASSOCIATION OF MALAYSIA (TEEAM)*
- *SEWERAGE SERVICES DEPARTMENT*
- *FMM-MALAYSIAN GASES MANUFACTURERS GROUP*
- *THE INSTITUTION OF FIRE ENGINEERS (UK) MALAYSIA BRANCH (IFEM)*
- *MALAYSIAN WOOD PRESERVING ASSOCIATION*
- *DEPARTMENT OF OCCUPATIONAL SAFETY AND HEALTH (DOSH)*
- *THE INSTITUTION OF ENGINEERS, MALAYSIA (IEM)*

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