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# Relationship Analysis between Company Standard, SNI, and International Standard in Washing Machine: A Case Study at an Electronic Company

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**Abstract.** PT XYZ is an electronic company that produces some electronic goods, one of which is a washing machine. In 2014, the product has been certified and labeled SNI on its products. SNI is a national standard established by the Indonesian government as a reference in producing or marketing goods in Indonesia. This is done as a protection measure for consumers. In addition, SNI is used as a standard for producers to penetrate international markets. However, the SNI does not specify the overall components of the goods. In the SNI document, there is no provision on the material that must be used, the size that must be imposed, so the company can develop the design, material and size of the product in detail. Development of standards outside the SNI conducted by the company herein after referred to the company standard. Company standards can be derived from innovations and product experiments conducted by the company or can also come from other standards adopted by the company, as an example is international standards on washing machine products. Thus there are several standards used in one washing machine product. For that in this research will find the relation between standard used in one product of washing machine by using case study analysis approach.

## 1. Introduction

The current open trade (Free Trade) between countries will able to increase local products market access from one country to another. Each country will get a chance in the form of increased market access in the international market and at the same time it is an opportunity to have local products compete with foreign products. Indonesia in 2010 has import duty tariffs of 7.69% compare to another country. According to Ministry of Trade of the Republic of Indonesia that value is relatively low. The low average of duty tariffs on imported goods result in an increase of imported goods to Indonesia. Increase in imported goods caused competition between imported goods and local goods to occur. Based on this statistical data, it is required to tighten supervision toward the circulating goods. Quality assurance requires the readiness of business actors to produce products that meet certain qualities. One of the efforts in this assurance is to formulate physical and technical specifications criteria. This formula will be hereafter called as standards. In relation to the domestic market, the government has established Constitution Law no. 8 year 2009 about supervision of good/services that circulating in the market which a mandate for the Ministry of Trade. In the regulation, it is explained that one of the supervision parameters is the use of Indonesian Standard National (SNI) for domestic product or imported goods. But in 2012, there are 621 product/goods in domestic markets that do not comply with the terms set by government, the percentages are: as much as 39 percent electronic goods and electrical appliances, 20



percent of household goods, 13 percent of vehicle spare parts and the rest are building materials, food and drinks, and textiles goods (TPT). Various violations of SNI have been reported repeatedly and openly. Reported that there are 80 electronic goods that violate SNI terms in Depok city and currently sold at reputable shops [1]. Atriana [1] found that cheap prices has led to a large scale purchase of children toys, cosmetic and household equipment with inferior qualities. Meanwhile Fahriyadi and Sutardi [1] explained that the Ministry of Trade (Kemendag) find as much as 95 products from 215 products supervised throughout the January-August 2014 to be a violation of the Indonesian National Standard (SNI). Most types of products that do not meet the SNI terms are electronic products such as electric irons, fan, rice cooker, motorcycle helmet and cellular phone.

Standard is used to translate specifications to provide security, quality assurance, ease of operation and ensure compatibility. Standard is a technical requirement such as ways and methods that are organized based on the consensus of all parties in respect to the conditions of safety, security, health, environment, development of knowledge, experience and the development of the present and the future to obtain the most benefit possible. From the root word "standard" standardization is formed, meant as the process of funds development or determining a standard mainly to improve daily life quality in all fields. Standardization oriented on quality that grows dynamically [3] In Indonesian the standard word is basically a document that contains certain requirements that are prepared based on consensus by interested parties and approved by an institution that has been recognized together [4]. In ISO / IEC write the formula for understanding standards and standardization as follows, standardization and related activities. Standard is a document, established by consensus and approved by a recognized body, that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context. And standardization is (the) activity of establishing either regard to actual or potential problems, provisions for common and repeated use, aimed at the achievement of the optimum degree of order in a given context [5]. Standardization can be classified as a knowledge discipline [6]. According to the definition, the definition of discipline here is "branch of instruction or learning". To facilitate and assist understanding of standards and standardization, Lal Verman put forward "the standardization space with the subject on the x-axis, the aspect on the y-axis, and the level on the z-axis. In Indonesia Indonesian National Standard IEC 60335-2-7: 2009 is a special standard of electrical devices about Washing Machines. SNI IEC 60335-2-7: 2009 refers to SNI IEC 60456: 2009 which is the standard for household electrical appliances and the first part of the type [7].

## **2. Research Methodology**

We use a case study research methodology to organize this research. The methodology is a qualitative method that focuses on a particular case as in [8]. Case study method as one type of descriptive approach, is research that is carried out intensively, in detail and deeply towards an organism (individual), institution or certain symptoms with a narrow area or subject. The case study is a research design to study, to explain or to interpret a unit of analysis without any intervention from outside parties [9]. Data collection was done using in-depth interviews, observation and document study. Data in case studies can be obtained from various sources but are limited in the case to be examined [10]. Qualitative research is a series of interpretation techniques for describing, decoding, translating that are adapted to natural conditions [11].

## **3. Results**

### *3.1. Washing Machine PT XYZ*

The washing machine is a machine designed to clean clothes and other household textiles. PT XYZ has several types of washing machines. Broadly speaking there are 3 types that have been produced by PT XYZ, namely:

1. Top Loading; Top-loading washing machine is a washing machine with an opening door at the top of the washing machine. At PT XYZ washing machine is designed with special technology for better washing performance and preserves clothing texture.
2. Front Loading; Front loading washing machine is a washing machine with an opening door on the front of the washing machine. At PT XYZ, the type of washing machine is designed with excellent features to save energy, time and keeps clothes hygienic.
3. 2 Tubes; Washing machine type 2 Tubing is a washing machine that has 2 tubes that serve as a washer and dryer. In this study, the standard used is standard for washing machine 2 Tube capacity 8 kg In fact there are many parts in one washing machine product. In this study parts of the washing machine which will then be used in data processing, are: Hose B, Pulsator, Washing Machine, Drying Motor, Seal, V Belt, Wash Lid, Wash Tub, Inner Lid, Spin Tub and Label Service. Overall there are hundreds of parts in one washing machine. In this study only used about 15% of the total part in the washing machine. The production strategy of PT XYZ were described as follows

**Table 1.** Production Strategy PT XYZ

NO	PART	PRODUCTION/ SUBCONTRACT	LOCAL /IMPORT
1	Hose B	Subcontract	Local
2	Pulsator	Subcontract	Import
3	Washing Motor	Subcontract	Import
4	Drying Motor	Subcontract	Import
5	Seal	Subcontract	Local
6	V Belt	Subcontract	Local
7	Wash Lid	Subcontract	Local
8	Wash Tub	Subcontract	Local
9	Inner Lid	Subcontract	Local
10	Spin Tub	Subcontract	Local
11	Label Service	Subcontract	Local
12	Filter Assy	Subcontract	Import
13	Ring	Subcontract	Local
14	SD Cover	Subcontract	Local
15	Deco	Subcontract	Local
16	Base	Subcontract	Local
17	Panel	Subcontract	Local
18	Cabinet	Subcontract	Local

Table 1 is an overview of some of the washing machine parts and production strategies undertaken by PT XYZ which is then used for data processing. Table 1 shows that all parts of the washing machine are made outside the company (subcontracting). Subcontracting comes from domestic or foreign companies so that imports are made from outside country. Parts imported from outside country include Pulsator, Washer Motor, Dryer Motor, and Filter Assy. Indonesian National Standard (SNI) is the only nationally accepted standard in Indonesia formulated by SNI Formulation Technical Committee and stipulated by BSN. SNI washing machine was first made in 1987 which then made the changes and in the end is currently using SNI IEC 60335-2-7: 2009 and set to become mandatory SNI by the government in 2013. Standards of XY are the standard used by XY Electronics in its production process.

This standard was released on 2016. The standard is then described as follows. Scope of the standard is set for 3 project washer ie XY1, XY2, and XY3 with manual type electric washing machine. There are 2 types used for manual electric washing machine that is Type A and Type B.

There are several checks / tests conducted by PT XYZ before marketing its washing machine products, including checking the stability of use, strong washing tub, rotation speed, electrical, drying tub, and etc. However, in this research will be analyzed the parts related to checking on washing tub, rotation speed, drying tub as the basis to map between SNI and company standard.

### *3.2. Base Tube*

Base Tube is checked by checking Appearance and Specification Check. Base Tube is the basic foundation of a washing machine or foot washer. The function of Base Tube is to support and maintain the stability of the washing machine whether used or not. At PT XYZ used Base Tube made from Molding Polypropylene Plastics. Base Tube PT XYZ is supplied from local suppliers. Base Tube Specification as mentioned above is the application and development of SNI washing machine. In SNI IEC 60335-2-7: 2009, Base Tube is set in point number 20 on stability and mechanical hazards. In point 20.102 it says that appliances should not be adversely affected by unbalanced loads. Compliance is checked by the following test. The appliance is placed on a horizontal buffer and the load having a mass of 0.2 kg or 10% of the maximum mass of clothing specified in the larger, select manual and is fixed to the inner wall of the drum half-length of the drum. The appliance is supplied at rated voltage and operated during the water extraction period. The test is performed 4 times, the load uprooted and drums should not hit other parts except enclosures. After testing, the appliance shall withstand for subsequent use.

In addition Base Tub is arranged in point number 30 on resistance to materials and fire. In point 30.1 it is said that the external portion of the nonmetallic material, the insulating material portion supporting the active part including the linkage, and thermoplastic material providing supplemental or reinforced insulation, shall be sufficiently resistant to heat if its deterioration may cause the device to fail to meet the standard. The test is carried out at a temper PT XYZ has performed in accordance with the written in SNI. Then PT XYZ provides innovation on the shape, size, and molding used in Base Tub washing machine, so that XY washing machine pass the testing of stability and fire resistance.

### *3.3. Motor on Wash Tub*

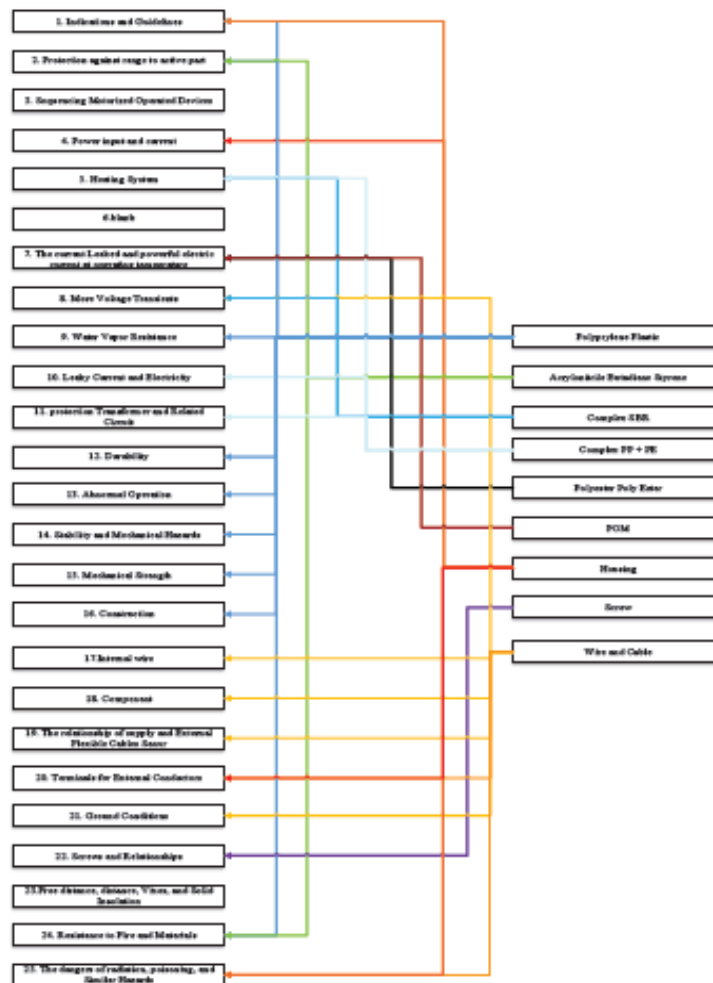
The motor on the Wash Tub is checked through Performance & Safety Check and Long Term Life Test checks. The motor in Wash Tub is the driving force in doing the washing. The motor provides power to the Pulley Assembly to perform the washing. The motor used is a motor with AC current. At PT XYZ used Motor on Wash Tub imported from foreign country. The motor is the application and development of SNI washing machine. In SNI IEC 60335-2-7: 2009, Motor on Wash Tub is arranged in point number 10 on power and current input.

At this point PT XYZ has applied SNI properly. XY uses 1.3A rated power in normal operation. PT XYZ has performed in accordance with the written in SNI. Then PT XYZ provides innovation on power and rated current of 240V and 1,3A which in SNI only limits. Then the development is done by placing the motor in the washing machine. Place the motor on the bottom / base covered by pulley assembly and pulsator. Thus the XYZ washer passes the test of power input and current.

### *3.4. SD Cover*

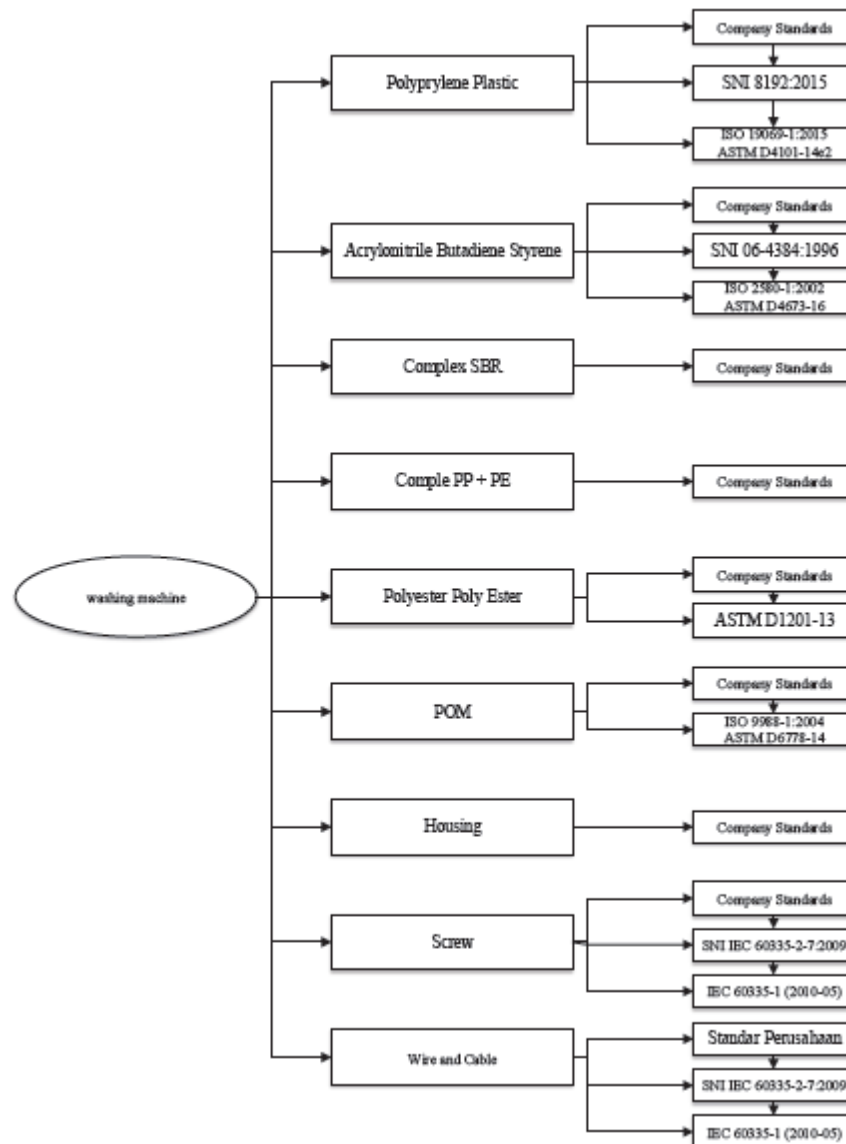
SD Cover is the cover or door of the wash tub. The function of SD Cover is to protect or cover the wash tub during operation or not. At PT XYZ used SD Cover made from ABS Molding (Acrylonitrile Butadiene Styrene). SD Cover mounted on this washing machine is 2 pieces located for washer and dryer. In SD Cover there is also a Caution Label for use. SD Cover specification as mentioned above is the application and development of SNI washing machine. In SNI IEC 60335-2-7: 2009, SD Cover is set forth in point 30 concerning resistance to materials and fire. In point 30.1 it is said that the external portion of the nonmetallic material, the insulating material portion supporting the active part including

the linkage, and thermoplastic material providing supplemental or reinforced insulations, shall be sufficiently resistant to heat if its deterioration may cause the device to fail to meet the standard. Then PT XYZ Indonesia provides innovation on the shape, size, and material used on SD Cover washing machine, so that XY washing machine pass fire resistance tests. ABS material is thermoplastic polymer and amorphous polymer. This type of polymer is heated to its melting point, cooled, and heated again without significant degradation. ABS will begin testing the washing machine.



**Figure 1.** Relationship pattern of SNI and industrial standards

Pattern Relationship of Industrial Standard and SNI can be described patterns of relationships that occur. The following is the pattern of relationship between Industrial Standard and SNI (Figure 1). In the Figure 1 pattern can be seen that some parts or grouping of parts on the machine has a relationship of any points on the washing machine SNI. From the above pattern, the Polypropylene Plastic material is most related to the washing machine SNI, while the Screw group only relates to 1 ie with SNI point 22 of the Screw and its relation. Of the 25 points on the washing machine SNI and 9 points on the material standard of the company, there is one point on the SNI that has no relation to the material of the company. SNI point 23 on clearances, creep age distances, and solid insulation has no relation to the material chosen by the company. Clearance, creep age distances, and insulation shall be related at the time of assessment by the certification body. The certification body will ascertain whether the clearance, creep age distance, and solid insulation is whether there is any effect on safety and safety on the consumer. Clearance, creep age distances, and solid insulation actually affect the interior of the washer, ie the distance between one components with other components,



**Figure 2.** Mapping between SNI, company standard and international standard

#### 4. Conclusion

The conclusions of this study area. Mapping of Company Standards, SNI and International Standards is based on grouping based on the materials used. There are 9 groups of materials used as mapping of Polypropylene Plastic, Acrylonitrile Butadiene Styrene, Complex SBR, Complex PP + PE, Polyester Poly Ester, POM, Housing, Screw, and Wire & Cable. This group is then connected to the 25 points contained in the washing machine SNI (SNI IEC 60335-2-7: 2009) resulting in the mapping as shown in Figure 2. After that the group was mapping the International Standards. From the mapping, there are several international standards that affect the group of materials in the washing machine that is, IEC (International Electro technical Commission) and ASTM (American Society for Testing and Materials). International standards have a wider scope compared to SNI, as well as with SNI have a wider range than the Standard Company. But this does not limit the company in doing development or innovation in making a product, especially in this case the washing machine. There are several sectors not specifically regulated by international standards or SNI. So that the company can improve the international standard and SNI by creating the company standard as a reference in the production process later.

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