

Management and Safety Practices in the Pyrotechnics Industry: The Province of Bulacan Experience

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Abstract: This study determined the management and safety practices of pyrotechnics manufacturers and dealers in the province of Bulacan towards the effective management and implementation of safety policies in the pyrotechnics industry. Specifically, it investigated the following sub-problems: 1. How can the profile of the respondent manufacturers and dealers of pyrotechnics can be described in terms of the following: Sources of technical and managerial skills, Sources of funding, Building ownership, Monthly rentals, Manufacturing period, Distribution period, Profits earned; 2. What are the management practices of the respondent manufacturers and dealers in terms of the following areas: Production and Dealership; 3. What common problems were encountered by the two groups of respondents and which of them has the greatest impact? 4. To what extent are the provisions of RA 7183 implemented by the respondents when grouped as follows: Manufacturer and Safety Policy Authority respondents, Dealer and Safety Policy Authority respondents, Dealer and Manufacturer respondents; 5. Is there a significant difference on the extent of implementation of safety measures provided by the RA7193 when the respondents are grouped as follows: Dealer and Safety Policy Authority respondents and Dealer and Manufacturer respondents. This study employed the descriptive method of research, which investigated the management and safety practices of fireworks manufacturers and dealers and the safety policy authorities of Bocaue and Sta. Maria, Bulacan. The respondents of the study were the pyrotechnics manufacturers, the dealers and the DOH local employees of Bocaue and Sta. Maria Bulacan. The researcher used the survey questionnaire in order to gather data. The frequency distribution, percentage distribution, weighted mean and two mean t-test were used by the researcher for the statistical tool of the study. 1. Most of the manufacturers and dealers obtained their pyrotechnics materials and products on cash basis. 2. Invasion of cheap imported products was the greatest problem in the pyrotechnics business. 3. There were differences in the extent of implementation of the pyrotechnics manufacturers and dealers and safety policy authorities in relation to safety measures. 4. There was a significant difference in the extent of implementation of pyrotechnics dealers and safety policy authorities as to the extent of following the requirements for safety.

Keywords: Pyrotechnics, Safety Policy, Dealers, Manufacturers, Safety Policy Authorities

I. INTRODUCTION

The word pyrotechnics refers to the art, craft, and science of fireworks. It is said that the birthplace of fireworks is China. Legend has it that a Chinese cook accidentally mixed three common ingredients: potassium nitrate, sulfur and charcoal, and which he lighted, a mass of colorful flames burst forth. The cook also noticed that if the mixture was burned when enclosed in the hollow of a bamboo stalk, there was a tremendous explosion. The first application of this technology was for entertainment. Pyrotechnics which is sometimes called fireworks and firecrackers, are products formed from the mixtures of gunpowder and other elements which are shaped, or pressed together to develop the firework products desired. In the Philippines, the beginnings of the pyrotechnics industry was a non-formal business owned by families with the purpose of providing fun and entertainment in special occasions such as fiestas, Christmas, New Year's Eve, weddings and baptism to create a joyful and festive environment. The continuing demand for the pyrotechnic products over the years has motivated the family owners

of the business to produce more and supply the increasing demand of the consumers. It has attracted more business

oriented families to venture in the business. Manufacturers and dealers grew rapidly due to the high profits generated by the industry. Although it is hard to quantify revenues from pyrotechnics because of the proliferation of underground establishments and smuggled goods, it is noted that the industry is worth about P350-400 million. The industry provides employment and enterprise development opportunities for some 100,000 locals [1]. However, this has also made the town susceptible to large fires every New Year. Despite the efforts of the local and provincial government of the province of Bulacan to implement the safety policies in the pyrotechnics industry, it observed that many stakeholders of the industry still resort to procedures and practices that are not healthy to its growth. According to the report, many dealers in Bocaue, Bulacan, have stocks of imported products allegedly made by local fireworks manufacturers and these inferior products which are believed to be produced by the manufacturers who do not totally follow

the safety measures, are the source of fireworks accidents that instigated injuries and sometimes death to the New Year revelers.

II. RESEARCH METHODOLOGY

This study employed the descriptive method of research which investigated the management and safety practices of fireworks manufacturers and dealers and the safety practices authorities of Bocaue and Sta. Maria, Bulacan. The total number of the pyrotechnics dealers of Bocaue, Bulacan is 139 and there are 4 dealers in Sta. Maria, Bulacan with a cumulative sum of 143 of which, 15 were not included in the choice of respondents because they were utilized as persons who pretested the survey questionnaire. The manufacturers from Bocaue are 22 and there are 27 from Sta. Maria, both small and big manufacturing enterprises which is equivalent to 49 of which 3 of them were also utilized as the persons who pretested the survey questionnaire. The safety policy authorities which are composed of the Bocaue and Sta. Maria Philippine National Police members, the Bureau of fire Protection personnel and the employees of the local Department of Health are 43. The researcher used extensively the survey questionnaire. The following statistical tools were used in the study: Frequency distribution, Percentage distribution, Weighted mean and T-test.

III. RESULTS AND DISCUSSION

A. Profile of the Pyrotechnics Manufacturers and Dealers

1. *Profile of Respondents as to the Sources of Technical and Managerial Skills in Business Operation.* Table 1 disclosed the profile of respondents as to the sources of technical and managerial skills in business operation. Thirty-one or 75.61% of the manufacturers learned their technical and managerial skills from experience learned from parents. Fifty-two or 53.61% of the pyrotechnics dealers learned their technical and managerial skills from self-study and observation. This means that most of the manufacturers and dealers under study did not undergo any formal training to learn the basics of the business.

2. *Profile of Respondents as to Sources of Funds/Initial Capital.* Table 2 showed the sources of funds/initial capital of the respondent manufacturers and dealers. Thirty one or 75.61% of the manufacturers' capital came from their own savings. There are 66 or 68.04% dealers who revealed that their initial funds came from their own savings. The implication of these findings is that most of the pyrotechnics manufacturers and dealers are all sole proprietors and they are the owners of the business.

3. *Profile of Respondents as to Building Ownership.* Table 3 illustrated the profile of respondents as building ownership of the pyrotechnics manufacturers and dealers. Thirty or 73.17% of the manufacturer revealed that the building is rented. On the part of the dealer, sixty eight or 70.10% said that it is rented. Majority of the manufacturers and dealers are renting the land and the building of the business location. The data stated that the

respondents are not regular occupants of the place and was complemented by the temporary use of permit that the respondents had to secure before the business starts.

4. *Profile of Respondents as to Monthly Payment for Building for Business Purposes.* Table 4 demonstrated the profile of the respondents as to monthly payment of pyrotechnics manufacturers and dealers for the building and location for business purposes. It also showed that several of the manufacturers and dealers will not rent a place which will have a higher rent due to the fact that the capital investment of the majority of the respondent manufacturers and dealers are coming from their own savings.

5. *Beginning Month of Manufacturing and Distribution of Pyrotechnics Product.* Table 5 revealed the profile of the respondents as to the beginning month of manufacturing and distribution of pyrotechnics products. Twelve or 29.27% is the highest number of the manufacturers who affirmed that the season for manufacturing pyrotechnics products is in the month of September followed by the month of January while thirty-one or 31.96% is the highest number of the dealers who confirmed that the month of October is the month to start distributing/selling the pyrotechnic products. The manufacturers and dealers do not open the business in lean months but engaged in other businesses such as selling fruits and other products in season as it is seen and observed in the location.

6. *Profile of Respondents as to Peak Season Months for Manufacturing and Selling/ Distributing Pyrotechnics Products.* Table 6 disclosed the profile of the respondents as to the peak season months for manufacturing and distribution of pyrotechnics products. Forty or 97.56% of the respondent manufacturers revealed that the month of December is the peak season for manufacturing and selling pyrotechnics products. For the dealers, sixty seven or 69.07% said that December is the peak season for selling the products. The data demonstrated that the manufacturers and dealers are supplying the needs of the buyers who purchase the pyrotechnic products in December in preparation for the New Year's celebration.

7. *Profit Earned by Pyrotechnics Manufacturers and Dealers.* Table 7 explained the profile of the respondents as to profit earned by pyrotechnics manufacturers and dealers. The figures in the table revealed that not one of the respondents have incurred losses in the operation which make the pyrotechnics industry a very valuable source of income.

B. Management Practices of the Respondent Pyrotechnics Manufacturers and Dealers in terms of:

1. *Management Practices on Production as to the Method of Obtaining Pyrotechnic Materials from Suppliers.* Table 8 showed the management practices of the pyrotechnics manufacturers and dealers in terms of production as to obtaining pyrotechnics materials from suppliers. Thirty-eight or 92.68% of the respondent manufacturers showed

that the products are obtained through cash basis. Seventy three or 75.26% of the dealers said that they acquire the materials from suppliers on cash basis. The manufacturers and dealers paid cash to obtain the supplies due to the fact that the suppliers have to save the money for initial capital purposes for the next business operation.

2. Management Practices on Dealership as to Terms of Sales and Deliveries. Table 9 showed the management practices of pyrotechnics manufacturers and dealers on dealership as to terms of sales and deliveries. Thirty eight or 92.68% of the manufacturers disclosed that the pyrotechnics products are sold in cash basis. Most of the respondent manufacturers and dealers showed that the products are obtained through cash basis. The buyers of the products paid cash due to the fact that the manufacturers and dealers have to save the money for capital purposes for the next business operation. It can be surmised that majority of the sources of the initial capital of the respondents are coming from their own savings.

3. Management Practices on Dealership in Terms of Sales Increase. Table 10 revealed the management practices of pyrotechnic manufacturers and dealers on dealership as to sales increase. Thirty nine or 95.12% disclosed that sales increases is due to promotion by word of mouth. The primary process to increase the sales is the promotion by word of mouth as disclosed by 39 manufacturers and 58 of the dealers. These processes of sales increase is the practice of the manufacturers and dealers since Bulacan is the pyrotechnic capital of the Philippines and it is known in the entire country.

C. Common Problems Encountered by the Respondent Manufacturers and Dealers.

1. Problems with Greatest Impact in the Pyrotechnic Business. Table 11 demonstrated the problems with greatest effect in the pyrotechnics business. Twenty nine or 70.73% of the manufacturers said that production cost is the problem with greatest effect in the pyrotechnics business. Thirty one or 75.61% stated that the invasion of cheap imported products is the greatest problem they are facing. Forty eight of 49.48% of the pyrotechnics dealers revealed that production cost affect their business.

2. Common Problems of Pyrotechnic Manufacturers and Dealers in the Area of Marketing (Combined Result). Table 12 illustrated the common problems of pyrotechnic manufacturers and dealers in the area of marketing. Ninety Five or 68.84% of the respondents showed that strong competition is one of the marketing problems and 28 said that the seasonality of the products is a marketing problem for the product. Majority of the manufacturers and dealers demonstrated that strong competition is the primary problem in marketing the product and followed by cost increases on supplies or price increases in the supplies of raw materials and the price increases on finish pyrotechnics products.

3. Common Problems of Pyrotechnics Manufacturers and Dealers in the Area of Finance (Combined Result). Table

13 demonstrated the common problems encountered by pyrotechnics manufacturers and dealers in the area of finance. Ninety seven or 70.29% revealed that short of cash for the initial capital is their financial problem and 89 or 64.49% stated that short of cash for operating expenses is also a financial problem of the respondent. These findings implied that the pyrotechnics manufacturers and dealers only have few accesses to credit and that the majority of the manufacturers and dealers have to save the profit earned during the peak season in order to start the business for the next business operation.

D. Extent of Implementation of RA 7183 by the Two Groups of Respondent.

1. Extent of Implementation of RA 7183 by the Manufacturer and Safety Policy Authority Respondents in Relation to Licensing. Table 14 explained the extent of implementation of RA 7183 by the manufacturers and safety policy authority respondents in relation to licensing. Among the requirements for licensing for the manufacturers, all the respondents had illustrated that all the requirements for licensing have been followed by the manufacturers and safety policy authorities. This reveals that the extent of implementation of RA 7183 by the manufacturer and dealer respondents in relation to licensing has a different degree on the part of the two groups of respondents as it is shown in the subsequent tables

2. Extent of Implementation of RA 7183 by the Manufacturer and Safety Policy Authority Respondents in Relation to Temporary Use Permit. Table 15 revealed the extent of implementation of RA 7183 by the manufacturer and safety policy authority respondents in relation to temporary use permit. The manufacturer and safety policy authority demonstrated that they always follow the rules in terms of the use of temporary permit.

3. Extent of Implementation of RA 7183 by the Manufacturer and Safety Policy Authority Respondents in Relation to the Location of the Manufacturing Complex. Table 16 explained the extent of implementation of RA 7183 by the manufacturer and safety policy respondents in relation to the location of the manufacturing complex. The manufacturers revealed that the manufacturing complex has adequate ventilation, has no concrete floor, is leak proof, and has a fire extinguisher. This safety guideline acquired a mean rating of 3.97 with a qualitative meaning of "always". For the safety policy authorities, most of the items have a mean rating of 3.31 and 3.45, respectively, with a verbal interpretation of "always". However, item 3 and 4 obtained a mean rating of 3.12 and 3.00, respectively, with a qualitative meaning of "more often".

4. Extent of Implementation of RA 7183 by the Manufacturer and Safety Policy Authority Respondents in Relation to the Safety Guidelines During the Processing of Pyrotechnics Products. Table 17 demonstrated the extent of implementation of RA 7183 by manufacturer and safety policy respondents in relation to the safety guidelines during the processing of pyrotechnic products. "The

manufacturers inform the workers that the chemicals to be used for processing shall be limited to the smallest quantity necessary for safe, economical and efficient operations” and “The workers keep the chemicals closed and covered in a containers at all times except during processing” got a mean rating of 4.0 each with a qualitative meaning of “always”. The manufacturers and the safety policy authorities have a different degree of perception in the extent implementation of in relation to safety guidelines during the processing of the pyrotechnics products.

5. Extent of Implementation of RA 7183 by the Dealer and Safety Policy Authority Respondents in Relation to Safety Measures to Prevent Fire and Damage to Properties, Injuries and Casualty. Table 18 illustrated the extent of implementation of RA 7183 by the dealer and safety policy authority respondents in relation to safety measures to prevent fire and damage to properties, injuries and casualty. Among the safety measures to prevent fire and damage to property, injuries and casualty on the part of the manufacturers, “Putting of the fire extinguisher inside the store is required”, got the highest mean rating of 4.0 with a qualitative meaning of “always”. The dealers said that they “always” prevent individuals to smoke within 10 meter radius perimeter of the fireworks. These results are complemented by the reports of the Bocaue Fire Protection personnel about some of the deficiencies of the manufacturers and dealers with regards to the necessary safety equipments that must be displayed in the manufacturing sites and in the stores.

6. Extent of Implementation of RA 7183 by the Manufacturer and Dealer Respondents in Relation to Licensing. Table 19 presented the extent of implementation of RA 7183 by the manufacturer and dealer respondents in relation to licensing. The two groups of respondents showed that they always implement the RA 7183 in relation to licensing. On the part of the manufacturers, the item with the highest mean rating was item 3 (Secure business permit duly issued by the municipal mayor/treasurer of the place) with a mean rating of 4.00. The highest mean given by the dealer respondents is for item 5 (The detail and location plan of the warehouse is duly noted by the barangay chairman, and the chief of the local fire station) with a mean rating of 3.90. This means that the two groups of respondents had different extent of implementation of RA 71 83 in relation to licensing as shown by the different mean ratings presented. On the average, the manufacturer and dealer respondents revealed that they “always” implement the RA 183 in relation to licensing their business but different in the weighted means.

7. Extent of Implementation of RA 7183 by the Manufacturer and Dealer Respondents in Relation to Temporary Use Permit Table 20 revealed the extent of implementation of RA 7183 by the manufacturer and dealer respondents in relation to temporary use permit. The two groups of respondents showed that they always implement the RA 7183 in relation to licensing. However,

they had different mean ratings for each item. On the part of respondent dealer, the item with the highest mean rating is 4 for item 1 (Secure clearance from the Barangay Council for authority to manufacture fireworks). On the part of the dealers the highest mean rating given was 3.86 for item 1 (Secure clearance from the Barangay Council for authority to manufacture fireworks. This means that the two groups of respondents had different extent of implementation of RA 71 83 in relation to temporary use permit as shown by the different mean ratings presented.

E. Significant Difference in the Extent of Implementation of Safety Measures by the Two Groups of Respondents.

1. Significant Difference in the Extent of Implementation by Dealer and Safety Policy Authority Respondents in Relation to Licensing. Table 21 showed an independent two sample t-test was conducted at 5 percent level of significance. For the licensing, the computed t-test had a value of 6.060 at 132 degrees of freedom and a corresponding p-value of 0.00 which was less than the 5 percent level of significance, the null hypothesis of no significant difference in the extent of implementation by dealer and safety policy respondents in relation to licensing was rejected. Therefore, the perceptions of the dealers and of the safety policy authorities as to the extent of implementation of the requirements for licensing are significantly different at the 5% level of significance.

2. Significant Difference in the Extent of Implementation by the Dealer and Safety Policy Respondents in Relation to Temporary Use Permit. Table 22 showed the significant difference in the extent of implementation by the dealer and safety policy respondents in relation to temporary use permit. An independent sample t-test was conducted at 5% level of significance to know the significant difference in the extent of implementation by the dealer and safety policy respondents in relation to temporary use permit. The table also revealed the computed t-value of 4.754 with a corresponding p-value of 0 and with a level of significance of .05 and a degree of freedom of 133, the null hypothesis of no significant difference on the perception of pyrotechnics dealers and safety policy officer as to the extent of implementation by the dealer and safety policy respondents in relation to temporary use permit was rejected.

Therefore, the assessments of the dealers and of the safety policy authorities as to the extent of implementation by the dealer and safety policy respondents in relation to temporary use permit were significantly different at the 5% level of significance.

. Significant Difference Extent of Implementation by the Dealer and Safety Policy Authority Respondents in Relation to Safety Practices to Prevent Fire and Damage to Properties, Injuries and Casualty. Table 23 revealed the significant difference in the extent of implementation by the dealer and safety policy respondents in relation to safety practices to prevent fire and damage to properties, injuries and casualty. With a level of significance of .05

and a degree of freedom of 135, the computed t-value was 3.266 and with a corresponding p-value of 0, it means that the null hypothesis of no significant difference in the extent of implementation by the dealer and safety policy respondents in relation to safety practices to prevent fire and damage to properties, injuries and casualty was rejected. Therefore, the extent of implementation by the dealer and safety policy respondents in relation to safety practices to prevent fire and damage to properties, injuries and casualty are significantly different at the 5% level of significance.

F. Significant Difference in the Extent of Implementation of Safety Measures by the Two Groups of Respondents.

1. Significant Difference in the Extent of Implementation by the Manufacturer and Dealer Respondents in Relation to Licensing. Table 24 demonstrated the significant difference in the extent of implementation by the manufacturer and dealer respondents in relation to licensing. To determine the significant difference in the extent of implementation by the manufacturer and dealer respondents in relation licensing, an individual two sample t-test was conducted. The t- statistics obtained a value of 1.764 at 130 degrees of freedom and a corresponding p-value of 0.80 which is greater than the 5 percent level of significance, the null hypothesis of no significant difference in the extent of implementation by the manufacturer and dealer respondents in relation licensing was not rejected. Therefore, there is no significant difference in the in the extent of implementation by the manufacturer and dealer respondents in relation to licensing.

2. Significant Difference in the Extent of Implementation by the Manufacturer and Dealer Respondents in Relation to Temporary Use Permit. Table 25 showed the significant difference in the extent of implementation by the manufacturer and dealer respondents in relation to temporary use permit. An independent sample t-test was conducted at 5% level of significance to know the significant difference in the extent of implementation by the manufacturer and dealer respondents in relation to temporary use of permit. Table 2 also revealed the computed t-value of -0.558 with a corresponding p-value of 0.57 and with a level of significance of .05 and a degree of freedom of 131, the null hypothesis of no significant difference in the extent of implementation by the manufacturer and dealer respondents in relation to temporary use permit was not rejected. Therefore, there was no significant difference in the extent of implementation by the manufacturer and dealer respondents in relation to temporary use permit.

The following are the findings of the study:

1. Thirty eight or 92.68% of the manufacturers obtained their pyrotechnics materials from suppliers to be used for producing pyrotechnics products on cash basis.

2. In terms of problems in production, the manufacturers and dealers stated that invasion of cheap imported products is the problem with greatest effect in the pyrotechnics business.

3. There were differences in the extent of implementation of the pyrotechnics manufacturers and dealers and safety policy authorities in relation to safety measures. There was a difference in the extent of implementation of the manufacturers and dealers in relation to licensing as well as on the temporary use permit.

4. There was a significant difference in the extent of implementation of pyrotechnics dealers and safety policy authorities as to the extent of following the requirements for licensing. There was a significant difference in the extent of implementation of pyrotechnics dealers and safety policy authorities as to the extent of implementing the requirements for temporary use permit. There was a significant difference in the extent of implementation of pyrotechnics dealers and safety policy authorities as to the extent of following the safety practices to prevent fire and damage properties, injuries and casualty. There was no significant difference in the perception of pyrotechnics manufacturers and dealers as to the extent of following the requirements for licensing. There was no significant difference in the perception of pyrotechnics manufacturers and dealers as to the extent of following the requirements for temporary use permit.

IV CONCLUSION

Based on the findings of the study, the following conclusions were derived: The manufacturers and dealers of pyrotechnics obtained pyrotechnics materials from suppliers through cash basis. The terms of sales and deliveries of pyrotechnics products are through cash basis followed by credit. The primary process to increase the sales is the promotion by word of mouth. The second process to increase the sales is to give discount to the customers.

The primary problem which affected the business operation of the manufacturers and dealers is the invasion of cheap imported products and second is the production cost. To the pyrotechnics manufacturers and dealers strong competition is the primary problem in marketing their product as well as cost increases on raw materials and on finished pyrotechnics products. The extent of implementation of the pyrotechnics manufacturers and safety policy authorities in relation to licensing was the same in terms of verbal interpretation but different means. The extent of implementation of the pyrotechnics manufacturers and safety policy authorities as to the extent of implementing the temporary use permit in terms of verbal interpretation was different in other items but similar in other items. There were differences in the means of the two groups. There was a difference in the degree of assessment between the pyrotechnics dealers and the safety policy authorities in the extent of implementing the requirements of licensing. The two groups had similar responses in terms of verbal interpretation but different in

the means. The pyrotechnics manufacturers, dealers and safety policy authorities had significant difference in the extent of implementation of safety measures in the pyrotechnic industry. There was a significant difference in the extent of implementation of the dealers and safety policy authorities as regards to licensing as well as in the implementation of safety practices to prevent fire and damage to properties, injuries and casualty but there is no significant difference in the extent of implementation of the manufacturers and dealers as regards to licensing and temporary use permit.

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REFERENCES

- [1] <http://www.bulacan.gov.ph>: *Brief History of Pyrotechnics*
- [2] Cooper Dale F., S. Grey, G. Raymond and P. Walker. (2005). West[1] Sussex, England. John Wiley & Son, Ltd., West Sussex, England.
- [3] Deshmukh, L. M. (2006). *Industrial Safety Management*. New York. Tata McGraw Hill Publishing Company Limited.
- [4] Go, Josiah. (2001). *Marketing in the Philippine Setting..* QC, Philippines. Design Plus
- [5] Tarlow, Peter E. (2002). *Event Risk Management and Safety*. New York. John Wiley & Son, Inc.
- [6] Vaughan, E. J. *Risk Management*. New York. John Wiley & Son, Inc.
- [7] Young, F. C. and C. Pagoso. (2008). *Principles of Marketing*. Manila, Philippines. Rex Bookstore
- [8] Alcantara, Antonio N. (2002) “*The Marketing Practices of Convenient Stores in the Province of Bulacan: An Assessment*”
- [9] Narcida, Angelita N. (1984) “*Management Practices of Domestic Construction Firms in Metro Manila*”
- [10] <http://dspace.lib.cranfield.ac.uk/bitstream>: *Towards Unified Theory of Strategic Manufacturing* (PDF)(2010)
- [11] <http://highered.mcgraw-hill.com>: *The Evolution of Management Theory*(2011)
- [12] <http://pom.ir/wp-content/uploads/PDF>: *Theory of Constraints: A Theory for Operations Management*
- [13] <http://www.laws.chanrobles.com/ph/ra/>: *Republic Act No. 7183* (2010)
- [14] <http://www.tmcnet.com>: *Pyrotechnics Industry in the Philippines* (2010)
- [15] <http://www.wardsdealer.com>: *CRM Requires Return on Effort* (2010) (7)
- [16] <http://www.en.wikipedia.org>: *Theory of Constraints* (3) (2010) (2011)
- [17] <http://www.oppapers.com>: *Operations Management* (2011)
- [18] <http://www.turnaround.org>: *Theory of Constraints* (2011)
- [19] <http://www.scribd.com>: *Social Marketing Theory* (2011)
- [20] <http://www.sara-stewart.com>: *The Domino Theory* (2011)
- [21] <http://www.ehstoday.com>: *How Fireworks Work* (2011)
- [22] <http://www.books.google.com.ph>: *Fireworks Ready to Boom* (2010)
- [23] <http://www.answers.yahoo.com>: *Pyrotechnics Safety Guidelines*(2011)
- [24] <http://www.schoolsite.edex.net.uk>: *Measures to Tackle Fireworks Misuse*
- [25] <http://www.helpme.com>: *The Chemistry of Fireworks* (2010)
- [26] <http://www.safety.lovetoknow.com>: *Fireworks Safety tips*(2010)
- [27] <http://www.images2.co.uk>: *Pyrotechnics Explosives* (2010)
- [28] <http://www.createfireworksshw.com>: *Pyrotechnics on Hoe to Make fireworks*
- [29] http://www.ors.act.gov.au/ors/pdfs/Newsletter/ORS_E-News_pdf: *ACT Fireworks License Holders Information* (2010)
- [30] <http://www.fire.state.mn.us>: *Fireworks Guidelines Revise 2004* (2010)
- [31] <http://www.enotes.com>: *Fireworks* (2010)
- [32] <http://www.skylinemedicalcenter.com>: *Fireworks Safety: Avoiding Injury*(2010)
- [33] <http://www.ky3.com>: *Missouri Fire Marshall Urges Caution with Fireworks*(2010)
- [34] <http://www.maricopa.gov>: *Summer Safety*
- [35] <http://positivenewsmedia.net>: *Bulacan Pyromakers Urged to Produce Safe, Good Quality Fireworks*
- [36] <http://www.tucp.org.ph>: *How Fireworks Work*
- [37] <http://www.mbcom.ph>: *Bulacan Fireworks Industry Alive Again*
- [38] <http://www.oshcenter@oshc.dole.gov.ph>: *Assessing the Occupational Safety*

Profile of Respondents as to the Sources of Technical and Managerial Skills in Business Operation

TABLE 1

Profile of Respondents as to the Sources of Technical and Managerial Skills

Sources of technical and Managerial Skills	Manufacturer		Dealer		Overall	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Schooling	0	0	10	10.31	10	7.25
Experience learned from parents	31	75.61	44	45.36	75	54.35
Self study and observation	25	60.98	52	53.61	77	55.80
Experience from previous job	19	46.34	26	26.80	45	32.61
Knowledge from friends	6	14.63	23	23.71	29	21.01
Seminars and trainings	1	2.44	28	28.87	29	21.01

TABLE 11

Profile of Respondents as to Sources of Funds/Initial Capital

Sources of Funds/Initial Capital	Manufacturer		Dealer		Overall	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
From own savings	31	75.61	66	68.04	97	70.29
From relatives and friends	9	21.95	24	24.74	33	23.91
From government banks	0	00	5	5.15	5	3.62
Loans from private banks	3	7.32	14	14.43	17	12.32
Loans from cooperatives	21	51.22	35	36.08	56	40.58
Loans from individual money lenders	8	19.51	15	15.46	23	16.67

TABLE 111

Profile of Respondents as to Building Ownership

Item	Manufacturer			Dealer			Overall	
	Frequency	Percentage		Frequency	Percentage		Frequency	Percentage
Building Ownership								
Owned	8	19.51		21	21.65		29	21.01
Rented			73.17			70.10		
71.01				0	0		5	5.15
5								
No Response	3	7.32		3	3.09		6	4.35
Total	41	100		97	100		138	100

TABLE 1V

Profile of Respondents as to Building Monthly Payment for Building for Business Purposes

Item	Manufacturer		Dealer		Overall	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Monthly Payment						
Php5,000 - Php6,999	28	68.29	46	47.72	74	53.62
Php7,000 - Php8,999	0	0	4	4.12	4	2.90
Php9,000 - Php10,999	0	0	5	5.15	5	3.62
Php11,000 - Php12,999	0	0	8	8.25	8	5.80
More than Php13,000	2	4.88	17	17.53	19	13.77
No Response	11	26.83	17	17.53	28	20.29
Total	41	100	97	100	138	100

TABLE V

Profile of Respondents as to the Beginning Month of Manufacturing and Distribution of Pyrotechnics Products

Item	Manufacturer		Dealer		Overall	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Month of Production/Distribution						
January	11	26.83	2	2.06	13	9.42
February	5	12.20	0	0	5	3.62
March	3	7.32	0	0	3	2.17
May	2	4.88	9	9.28	11	7.97
June	2	4.88	0	0	2	1.45
August	1	2.44	2	2.06	3	2.17
September	12	29.27	20	20.62	32	23.19
October	4	9.76	31	31.96	35	25.36
November	1	2.44	18	18.56	19	13.77
December	0	0	8	8.25	8	5.80
No Response	0	0	7	7.22	7	5.07
Total	41	100	97	100	138	100

TABLE VI

Profile of Respondents as to Peak Season Months for Manufacturing and Selling Distributing Pyrotechnics Products

Item	Manufacturer		Dealer		Overall	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Peak Season Month						
August	0	0	1	1.03	1	0.72
September	0	0	1	1.03	1	0.72
October	1	2.44	0	0	1	0.72
November	0	0	22	22.68	22	15.94
December	40	97.55	67	69.07	107	77.54
No Response	0	0	6	6.19	6	4.35
Total	41	100	97	100	138	100

TABLE V11
Profile of Respondents as to Profit Earned by Pyrotechnics Manufacturers and Dealers

Item	Manufacturer		Dealer		Overall	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Profit						
Php100,000 - Php299,999	36	87.80	67	69.07	103	74.64
Php300,000 - Php499,999	1	2.44	4	4.12	5	3.62
Php500,000 - Php699,999	0	0	5	5.15	5	3.62
Php700,000 - Php999,999	0	0	2	2.06	2	1.45
Php1,000,000 - Php2,999,999	0	0	1	1.03	1	0.72
Php3,000,000 and above	0	0	1	1.03	1	0.72
No Response	4	9.76	17	17.53	21	15.22
Total	41	100	97	100	138	100

Management Practices of the Respondent Pyrotechnics Manufacturers and Dealers in Terms of:

TABLE V111
Management Practices on Production as to the Method of Obtaining Pyrotechnic Materials from Suppliers

Item	Manufacturer		Dealer		Overall	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Method						
Cash/COD	38	92.68	73	75.26	111	80.43
Installment	0	0	21	21.65	21	15.22
On credit	24	58.54	38	39.18	62	44.93
Consignments	3	7.32	28	28.87	31	22.46

TABLE 1X
Management Practices on Dealership as to Terms of Sales and Deliveries

Item	Manufacturer		Dealer		Overall	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Terms of Sales and Deliveries						
Cash/COD	38	92.68	91	93.81	129	93.48
Installment	1	2.44	14	14.43	15	10.87
On credit	23	56.10	20	20.62	43	31.16
Consignments	7	17.07	13	13.40	20	14.49

TABLE X
Management Practices on Dealership in Terms of Sales Increase

Item	Manufacturer		Dealer		Overall	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Process Used						
Fireworks products are posted in the internet	1	2.44	3	3.09	4	2.90
Promotion by word of mouth	39	95.12	58	59.79	97	70.29
Discounts are given to customers	4	9.76	38	39.18	42	30.43
Fireworks products have better quality	22	53.66	77	79.38	99	71.74

Common Problems Encountered by the Respondent Manufacturers and Dealers

TABLE X1
Problems with Greatest Impact in the Pyrotechnic Business

Item	Manufacturer		Dealer		Overall	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Problems with Greatest Impact						
Production cost	29	70.73	48	49.48	77	55.80
Higher insurance premiums	0	0	4	4.12	4	2.90
Various overhead expenses	1	2.44	20	20.62	21	15.22
Government safety regulations	1	2.44	18	18.56	19	13.77
Invasion of cheap imported products	31	75.61	57	58.76	88	63.77

TABLE X11
Common Problems of Pyrotechnic Manufacturers and Dealers in the Area of Marketing (Combined Result)

Common Problems in Marketing	Frequency	Percentage
Procurement of supplies	6	4.34
Cost increases on supplies	84	60.87
Lack of information	1	0.72
Strong competition	95	68.84
Seasonality of the products	28	20.29
None	5	3.62

TABLE X111
Common Problems of Pyrotechnic Manufacturers and Dealers in the Area of Finance (Combined Result)

Common Problems in Finance	Frequency	Percentage
Inaccessibility to credit	12	8.70
Short of cash for the initial capital	97	70.29
Short of cash for operating expenses	89	64.49

Extent of Implementation of RA 7183 by the Two Groups of Respondents

TABLE XIV

Extent of Implementation of RA 7183 by the Manufacturer and Safety Policy Authority Respondents in Relation to Licensing

Interpretation	Manufacturer	Safety	Policy	Authorities
	Mean	Verbal Interpretation		Mean Verbal
1. Register the business to SEC if the business is a corporation		N/A		2.63
2. Register the business to DTI if the business is a single proprietorship		4.00	Always	3.93
Always				
3. Secure business permit duly issued by the municipal mayor/treasurer of the place	4.00	Always		3.93
4. Secure clearances of the manager from a) chief of police, PNP b) from the court c) certificate of good conduct from the mayor of the city or municipality	3.97	Always		3.63
5. The detail and location plan of the warehouse and manufacturing complex is duly noted by the barangay chairman, and the chief of the local fire station (mixing station, grinding station, packing station, pagmimita, loading station)	3.97	Always		3.91
6. The manufacturing complex is certified that it is located in a designated Area by the city/municipal engineer, barangay chairman, chief of the local fire station and by the mayor	4.00	Always		3.91
MEAN	3.98	Always		3.61

TABLE XV

Extent of Implementation of RA 7183 by the Manufacturer and Safety Policy Authority in Relation to Temporary Use Permit

Interpretation	Manufacturer	Safety	Policy	Authorities
	Mean	Verbal Interpretation		Mean Verbal
1. Secure clearance from the Barangay Council for authority to sell fireworks	4.00	Always		3.86
2. The only activity within the premises is trading and selling of fireworks	4.00	Always		3.55
3. The location of the store is in accordance with the specifications of the authority	3.97	Always		3.45
4. Expansion, alteration, improvement of the store is not introduced without prior clearance from the authority	3.82	Always		3.24
5. My stores displays fireworks/finished products limited to 50 kgs. Only	3.50	Always		3.43
6. The store provides a red painted drum filled with 50 gallons of water labeled with "For Fire Use Only" and the name of the store.	3.97	Always		3.60
7. The store has an approved type of portable fire extinguisher stationed inside the store.	3.95	Always		3.68
8. A six inches letter size signage with "No Testing & No smoking is posted in front of the store	3.76	Always		3.29
MEAN	3.87	Always		3.51

TABLE XVI

Extent of Implementation of RA 7183 by the Manufacturer and Safety Policy Authority Respondents in Relation to the Location of the Manufacturing Complex

Interpretation	Manufacturer	Safety	Policy	Authorities
	Mean	Verbal Interpretation		Mean Verbal
1. The manufacturing is 300 meters away from the nearest residential unit	3.74	Always		3.31
2. The manufacturing complex: has an adequate ventilation, has no concrete floor, is leak proof, has a fire extinguisher	3.97	Always		3.45
3. The ware house is 50 meters away from any processing station	3.87	Always		3.12
4. The processing stations have the following distance from each other: mixing - 50 meters, grinding - 40 meters, packaging - 40 meters, magmimita - 20 meters, loading - 20 meters	3.62	Always		3.00
MEAN	3.80	Always		3.22

TABLE XVII

Extent of Implementation of RA 7183 by the Manufacturer and Safety Policy Authority Respondents in Relation to the Safety Guidelines During the Processing of Pyrotechnic Products

Interpretation	Manufacturer	Safety	Policy	Authorities
	Mean	Verbal Interpretation		Mean Verbal
1. The workers have a minimum protective apparel	1.75	Rarely		2.85
2. The workers are oriented about the hazards and corresponding precautions of the chemicals he would be using	3.68	Always		3.10
3. The manufacturers inform the workers that the chemicals to be used for processing shall be limited to the smallest quantity necessary for safe, economical and efficient operations	4.00	Always		3.40
4. The workers mix the chemicals in a non-metallic containers; glass should not also be used.	3.85	Always		3.31
5. The workers keep the chemicals closed and covered in a containers at all times except during processing	4.00	Always		3.43
6. The workers use separate tools, scale pans, sieves for weighing the chemicals	3.87	Always		3.52
7. The date when the chemicals was received and the date the container is opened is clearly marked on all containers	2.87	More Often		3.26
8. The workers wash their hands and body thoroughly after a day's exposure to chemicals and wash hand and face thoroughly before meals	3.97	Always		3.24
MEAN	3.50	Always		3.26

TABLE XV111
Extent of Implementation of RA 7183 by the Dealer and Safety Policy Authority Respondents in Relation to Safety Measures to Prevent Fire and Damage to Properties, Injuries and Casualty

Interpretation	Manufacturer		Safety Policy Authorities	
	Mean	Verbal Interpretation	Mean	Verbal
1. No Smoking within 10 meter radius perimeter of the fireworks store	3.97	Always	3.63	Always
2. No testing of any fireworks items within a 300 meter radius perimeter of the fireworks store	3.95	Always	3.88	Always
3. Putting signboard/notice measuring 18 inches wide x 24 inches high, with written phrases "no smoking, no testing" in front of the store. The letters must be 6 inches high with a width of 1 inch.	3.96	Always	3.73	Always
4. Production of fireworks inside the store or near the store is prohibited	3.88	Always	3.55	Always
5. Stockpiling of fireworks inside the store is prohibited	3.81	Always	3.39	Always
6. Employment of minors is prohibited	3.86	Always	3.37	Always
7. Cooking inside the store is prohibited	3.93	Always	3.59	Always
8. Selling/peddling of any item using fire or flame in front of the store is prohibited	3.95	Always	3.71	Always
9. Drinking of any intoxicating drinks is prohibited within a 10 meter radius perimeter of the store	3.93	Always	3.59	Always
10. Putting of fire extinguisher inside the store is required	4.00	Always	3.98	Always
11. Putting of water filled red drum water container in front of the store with phrases "For Fire Use Only"	3.94	Always	3.95	Always
12. Fireworks items must be in a safe place like "estante". Placing Fireworks items on the table outside of the store is prohibited.	3.93	Always	3.71	Always
13. Fireworks which are easy to explode such as bombshell must be Placed inside the box.	3.99	Always	3.81	Always
14. Putting the name of the manufacturer and the address in boxes or wrapper of fireworks is required	3.90	Always	3.76	Always
15. Putting of emergency light	3.78	Always	3.67	Always
16. The store is separated from other stores by a firewall with a fire resistance of not less than two hours	3.94	Always	3.70	Always
MEAN	3.92	Always	3.68	Always

TABLE XIX
Extent of Implementation of RA 7183 by the Manufacturer and Dealer Respondents in Relation to Licensing

Interpretation	Manufacturer		Safety Policy Authorities	
	Mean	Verbal Interpretation	Mean	Verbal
1. I register the business to SEC if partnership or corporation	--	N/A	3.66	Always
2. I register the business to DTI if the business is a single proprietorship	4.00	Always	3.94	Always
3. I secure business permit duly issued by the municipal mayor/treasurer of the place	4.00	Always	4.00	Always
4. I secure clearances of the manager from a) chief of police, PNP b) from the court c) certificate of good conduct from the mayor of the city or municipality	3.97	Always	3.99	Always
5. The detail and location plan of my warehouse and manufacturing Complex is duly noted by the barangay chairman, and the chief of the local fire station (mixing station, grinding station, packing station, pagmimita, loading station)	4.00	Always	3.98	Always
6. My manufacturing complex is certified that it is located in a designated area by the city/municipal engineer, barangay chairman, chief of the local fire station and by the mayor.	3.95	Always	--	N/A
MEAN	3.98	Always	3.91	Always

TABLE XX
Extent of Implementation of RA 7183 by the Manufacturer and Dealer Respondents in Relation to Temporary Use Permit

Interpretation	Manufacturer		Safety Policy Authorities	
	Mean	Verbal Interpretation	Mean	Verbal
1. Secure clearance from the Barangay Council for authority to Always sell fireworks	4.00	Always	3.98	
2. The only activity within the premises is trading and selling of fireworks	4.00	Always	3.92	Always
3. The location of the store is in accordance with the specifications of the authority	3.97	Always	3.94	Always
4. Expansion, alteration, improvement of the store is not introduced without prior clearance from the authority	3.82	Always	3.71	Always
5. My stores displays fireworks/finished products limited to 50 kgs. Only	3.50	Always	2.71	More Often
6. The store provides a red painted drum filled with 50 gallons of water labeled with "For Fire Use Only" and the name of the store.	3.97	Always	3.97	Always
7. The store has an approved type of portable fire extinguisher stationed inside the store.	3.95	Always	4.00	Always
8. A six inches letter size signage with "No Testing & No smoking is posted in front of the store	3.76	Always	4.00	Always
9. The firework storage is located at a safe distance away from the location of the store and/or nearest residential/commercial areas	--	N/A	3.91	Always
MEAN	3.87	Always	3.79	Always

Significant Difference in the Extent of Implementation of Safety Measures by the Two Groups of Respondents

TABLE XXI
Significant Difference in the Extent of Implementation by Dealer and Safety Policy Authority Respondents in Relation to Licensing

Group	Mean	T	DF	Sig.(2 tailed)	Decision	Remarks
Dealer	3.91	6.06	132	0.00	Reject Ho	Significant
Safety Policy Authority	3.61					

TABLE XX11
Significant Difference in the Extent of Implementation by the Dealer and Safety Policy Authority Respondents in Relation to Temporary Use of Permit

Group	Mean	T	DF	Sig.(2 tailed)	Decision	Remarks
Dealer	3.79					
Safety Policy Authority	3.66	4.754	133	0.00	Reject Ho	Significant

TABLE XX111
Significant Difference Extent of Implementation by the Dealer and Safety Policy Authority Respondents in Relation to Safety Practices to Prevent Fire and Damage to Properties, Injuries and Casualty

Group	Mean	T	DF	Sig.(2 tailed)	Decision	Remarks
Dealer	3.92					
Safety Policy Authority	3.66	3.266	135	0.00	Reject Ho	Significant

TABLE XX1V
Significant Difference in the Extent of Implementation by the Manufacturer and Dealer Respondents in Relation to Licensing

Group	Mean	T	DF	Sig.(2 tailed)	Decision	Remarks
Dealer	3.98					
Safety Policy Authority	3.91	1.764	130	0.80	Accept Ho	Not Significant

TABLE XXV
Significant Difference in the Extent of Implementation by the Manufacturer and Dealer Respondents in Relation to Temporary Use Permit

Group	Mean	T	DF	Sig.(2 tailed)	Decision	Remarks
Dealer	3.87					
Safety Policy Authority	3.79	-0.558	131	0.57	Accept Ho	Not Significant

BIOGRAPHY



Dr. Felicidad A. Dy Kam completed her degree in Liberal Arts and Commerce major in Economics and Management from Ateneo de Naga University. She took her Master in Business Administration and Doctor in Business Administration from Polytechnic

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