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**STATUS OF REFRIGERATION AND AIR CONDITIONING SHOPS IN THE
PROVINCE OF BILIRAN**

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ABSTRACT

The study aimed to assess the status of facilities in refrigeration and air conditioning shops in the Province of Biliran. This study utilized the descriptive methods of research. The status of refrigeration and air conditioning shops in Biliran province was moderately adequate, the tools and materials were also moderately available. The personnel of RAC shops were not sufficient, accessible to. They had capital of 10, 000 and below, shops were not TESDA accredited and most of them had no license to operate the business. Shop owners had linkages to the households, local government while others had no linkages at all.

The demand for manpower in the refrigeration and air conditioning had increased the number of household with refrigerators and air conditioning each year. The problems of shop owners lies on the unavailability of parts and materials in the province while some of them had to comply the TESDA accreditation.

KEYWORDS: status, refrigeration, airconditioning shops, TESDA NC II, shop owners, Province of Biliran.

INTRODUCTION

Technology advancement makes life condition of the Shop owners enjoyable. The invention of the ages has brought new technologies like refrigeration and air conditioning which hold promise for further improving the living conditions of the family tapping the potentials of new technological facilities for the convenience in offices, schools and homes. Facilities in the homes/schools play a paramount importance in all walks of life.

People whether they are in the supermarket, in restaurant, in office, at home, or in other places benefit from refrigeration in many ways. They take cold drink to quench their thirst. They use electric fans or air conditioning to cool and refresh themselves. They keep their foods in the refrigerator to preserve and prevent from spoilage. They enjoy their recreation and leisure time with the help of refrigeration. All these comforts are brought about by refrigeration. (Technology and Home Economics, 1998)

Refrigeration and air conditioning are very much useful from day to day activities. Therefore, it must be given extra proper care to sustain/maintain its usefulness. Particularly, if there would be power interruption/brown out in the community normally the facilities at home or in school/offices would be damaged if this would not be given important consideration. When this happen, it would result to failure or the facilities may not function well.

It is along this line that the status of facilities in air conditioning must be assessed on what particular part of refrigeration and air conditioning needs repair, maintenance and troubleshoot.

To date, Biliran Province is now on its transition period compared in the past. Business is like mushrooms that sprout in any part of the province. People are motivated to start a business its because of the advance of Science and Technology (Garcia, 2011). One of the progressive aspect in running a business is the operation of refrigeration and air conditioning shops. Through business this would somehow solve the problem of unemployment existing in the locality.

Considering the fact, that Naval is a growing town in the Province of Biliran and the population has increased and almost all household have utilized the refrigerator and air conditioning and even its neighboring towns. There is a pressing need to conduct this study.

Moreover, assessing on the status of facilities in refrigeration and air conditioning requires various types of technical manpower. Industrial technologists, technicians, and skilled workers of various kinds are needed in the design, repair, installation, operation and maintenance of various facilities/machineries and in the production of various products. (Camarao, 2002)

The critical and increasing need for technical manpower accentuates the importance of determining the status of facilities in RAC shops in Biliran province.

This study is conducted to meet local consumption, create job opportunities, provide income for the people and enhance socio-economic development and besides for economic reason, the proponent felt the need/necessity to assess the status of facilities in refrigeration and air conditioning in Biliran Province mainly because his major of specialization is RAC. Results of this study could contribute as a baseline information in imparting knowledge and skills to his students and enhancing the on-the-job training and placement of the graduate. Finally, one major concern that must be addressed vigorously of this study is continuing need to insure quality work in the shops of refrigeration and air conditioning.

METHODOLOGY

This study utilized the descriptive methods of research to establish the profiles of the shop owners, evaluate the manpower demand of refrigeration and air conditioning shops and problems encountered by the shop owners.

This study was conducted in various municipality in the Province of Biliran. The respondents of this study were the proprietor/owner of the refrigeration and air conditioning shop, technicians, and the laborer/staff in the Province of Biliran.

The main instrument that was used in the gathering of data was the survey questionnaire and interview.

The researcher personally administered the questionnaire to the respondents and 100% retrieval of the questionnaires was expected.

The statistical treatment and techniques employed in this study were frequency, percentage and weighted mean in order to characterize the status of the refrigeration and air conditioning shops.

RESULTS AND DISCUSSION

Personal Profile of the Shop Owners

Table 1: Profile of the Shop Owners

Variables	f	%
Age		
51 years and above	2	11.76
41 - 50 years old	6	35.29
31 - 40 years old	5	29.41
20 - 30 years old	4	23.53
Total	17	100
Sex		
Male	16	94.12
Female	1	5.88
Total	17	100
Civil Status		
Single	4	23.53

Married	12	70.59
Separated	0	0
Widowed	1	5.88
Total	17	100
Educational Attainment		
Elementary Graduate	1	5.88
College Level	7	41.18
College Graduate	9	52.94
Total	17	100
TESDA Certification		
With certification	2	11.76
Without certification	15	88.24
Total	17	100
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Seminars/trainings related to RAC		
None	0	0

Age. As reflected in the table, the age profile of the respondents ranged from 20 years old and 51 years old and above. There were 6 or 35.29 percent whose age belonged in the bracket 41-50 years old while only 2 or 11.76 among the respondents aged from 51 years old and above. This implies that the Shop owners were still of middle age.

Sex. As shown in the table, most of the respondents were males with 16 or 94.12 percent while the 1 or 5.88 percent was female. Result reveals that there were more male respondents than their female counterpart.

Civil status. Results indicate that majority 12 or 70.59 percent of the respondents were married while 4 or 23.53 percent were single. This data reveals that the respondents are mostly married.

Educational attainment. As depicted in the table, most of the respondents 9 or 52.94 percent of them were college graduate, 7 or 41.18 percent were college level and only 1 or 5.88 percent was elementary graduate. This implies that shop owners were not all college graduate.

TESDA certification. As shown in the table, most of the respondents 15 or 88.24 percent were without certification and only 2 or 11.76 percent with certification. This implies that shop owners should apply TESDA certification.

Seminars/trainings attended related to refrigeration and airconditioning. Among of the 17 shop owners, nobody of them had attended seminars/trainings related to refrigeration and airconditioning. This reveals that they should be send to trainings in order to upgrade their skills in repairing RAC units.

Table 2: Adequacy of Facilities in RAC Shops

Facilities/Equipment	WM	Description
Masonry drill	4.18	Adequate
Window type air-conditioner	3.53	Moderately adequate
Fan motor	3.71	Adequate
High pressure water	3.12	Moderately adequate
Refrigerator units	4.0	Adequate
Vacuum pump	3.41	Moderately adequate
Evaporator fan and motor	3.0	Moderately adequate
Defective air swing motor	3.41	Moderately adequate
Good condition air swing motors	3.41	Moderately adequate
Refrigerator and air-conditioning unit with leak piping	2.41	Less adequate
Overload protector	3.59	Moderately adequate
Package type A/C unit	2.24	Less adequate

Arc welding machine	2.76	Moderately adequate
Recover/recycling machine	2.18	Less adequate
Commercial refrigeration units	2.18	Less adequate
Condenser fan motor	2.82	Less adequate
AWM	3.12	Moderately adequate

As shown in the Table 2, the status of RAC shops in terms of adequacy of facilities was ranged from 2.18 – 4.18. There were only 3 facilities described as adequate ranges from 3.72 – 4.0, while 8 facilities described moderately adequate ranges from 2.76 – 3.59 and 5 facilities described less adequate ranges from 2.18 – 2.82. The average weighted mean of 3.12 which described moderately adequate. This implies that shop facilities of the shop owner are moderately adequate.

Table 3: Availability of Tools in RAC Shops

Tools	WM	Description
Pliers	4.88	Very much available
Wrench box	4.6	Very much available
Screw driver	4.71	Very much available
Crimping tools	2.47	Less available
Bending tool	3.35	Moderately available
Swaging tool	3.94	Available
Flaring tool	4.18	Available
Tube cutters	4.29	Available
Vernier caliper	2.47	Less available
Adjustable wrench	4.41	Available
Open end wrench	4.65	Very much available
Multi-tester	3.41	Moderately available
Clamp ammeter	4.12	Available
Megger tester	2.06	Less available
Leak detector	2.0	Less available
Defrost heater	2.41	Less available
Door strip heater	2.12	Less available
Room thermometer	2.24	Less available
System analyzer	1.9	Less available
Digital thermometer	1.9	Less available
AWM	3.31	Moderately available

As illustrated in the foregoing table, there were 4 tools enumerated which described very much available in the shops, 3 tools were moderately available, 5 tools were available and 8 of the tools were less available. It was depicted in the table that average weighted mean of 3.31 in terms of the availability of the tools in the 17 shops were described to be moderately available.

Table 4: Availability of Materials in RAC Shops

Materials	WM	Description
Condensate drain	3.18	Moderately available
Electrical wire	4.12	Available
Circuit breaker/safety switch	3.47	Moderately available
Courseware (learning elements and manuals)	2.76	Moderately available
Switch	4.35	Available
Capacitor	4.47	Available
Relay	4.47	Available
Philippine electrical code	2.88	Moderately available
Electrical tape	4.47	Available
Air filters	2.82	Moderately available

Requisition slip	1.7	Not available
Oil	4.35	Available
Grease	4.0	Available
Rags	4.35	Available
Soap	4.65	Very much available
Sand paper	4.41	Available
Refrigerant cylinder	3.94	Available
Nitrogen gas	2.0	Less available
Personal protective equipment	3.0	Moderately available
Tubes (copper steel)	3.88	Available
Filler rolls	2.47	Less available
Fluxes	3.71	Available
Fittings	2.82	Moderately available
Nitrogen regulator	2.29	Less available
Googles	4.06	Available
High pressure washer	3.76	Available
Strike lighter	3.88	Available
Defective electrical controls	2.06	Less available
Relays	4.18	Available
AWM	3.53	Moderately available

As reflected in the preceding, one material enumerated to be very much available in the shops, 16 materials were available, 7 materials were moderately available, 4 materials were less available and only 1 material that was not available. From table 4, average weighted mean of 3.31 in terms of the availability of the tools in the 17 shops were described to be moderately available.

Table 5 shows the accessibility of the location of the RAC shops. It was found out that 17 or 100 % of the shops were located along the road which can readily be accessed by the clients through a motorcycle or vehicle.

Table 5: Accessibility of Location

Sufficiency of shop Personnel	f	%
Along the road by motorcycle and vehicle	17	100

Table 6 depicts the sufficiency of the personnel working in the shops. As illustrated in the succeeding table,

Table 6: Sufficiency of Shop Personnel

Sufficiency of Shop Personnel	f	%
7 - 10	0	0
4 - 6	3	17.65
1 - 3	14	82.35

It could be gleaned from the table, 14 or 82.35 percent of the shops had range of personnel from 1-3 persons and only 3 or 17.65 percent had 4-6 persons working in their shops. This implies that majority of the shops had a ranged of personnel from 1-3 persons.

Table 7 reflects the capital invested in the RAC shops. It is indicated in the succeeding table that 6 or 35.29 percent of the shops had a capital ranges from 10,000 and below, 5 or 29.41 percent has a capital worth 20,000, 3 or 17.65 percent had an investment amounted to 30,000 and likewise 50,000 and above. This implies that majority of the shops had a capital of 10,000 and below. This means that shop owners need more capital in order to purchase the needed materials for replacement of unserviceable unit.

Table 7: Capital of the RAC Shops

Capital	f	%
50, 000 above	3	17.65
40, 000	0	0
30, 000	3	17.65
20,000	5	29.41
10, 000 and below	6	35.29

Table 8: Mode of Services Provided

SERVICES PROVIDED	f	%
Major repair	1	5.88
Minor repair	2	11.76
Cleaning	14	82.35

As reflected in Table 8, 14 or 82.35 of the RAC shops in Biliran Province offered cleaning services to room aircondition units, 2 or 11.76 percent of the shops conducted a minor repair and only 1 or 5.88 percent of the shops conducted a major repair service to clients/customers.

Table 9 shows the status of the refrigeration and airconditioning in terms of TESDA Accreditation, license to operate the business and linkages.

Table 9 Status of RAC Shops in terms of TESDA Accreditation, License to Operate the Business and Linkages.

TESDA Accreditation	f	%
Not Accredited	17	100
License to Operate the Business	f	%
With license	2	11.76
Without license	15	88.23
Total	17	100
Linkages	f	%
Local Government Unit	4	23.53
Provincial Government	3	17.65
Private Agency	2	11.76
Households	5	29.41
None	3	17.65
Total	17	100

TESDA accreditation. As illustrated in the preceding table, all or 100 percent of the RAC shops in Biliran province were not TESDA accredited. This signifies that all shops must apply TESDA accreditation in order to upgrade the personnel's technical skills to be highly trained to meet the services needed by the customers.

License to operate the business. Among of the 17 shop owners, most 15 or 88.23 percent have no license to operate their business while only 2 or 11.76 percent have license. This indicates that shop owners should register their business before operating it.

Linkages. There were 5 or 29.41 percent of the shop owners have linkage to the households while 4 or 23.53 percent to local government unit, 3 or 17.65 to the provincial government and only 2 or 11.76 to private agency. Hence, there were 3 or 17.65 have no linkages. This implies that shop owners should find more linkages in order to be more productive in their income.

The RAC shops in the Province of Biliran was enumerated to the number of households with refrigerator and air-conditioner from year 2008-2009 to 2012-2013.

Table 10: Household with Refrigerator and Room Air Conditioner

Year	No. of Households with Refrigerator Units		No. of Households with Room Air Conditioner	
	(f)	%	(f)	%
2012-2013	600	60.0	300	30.0
2011-2012	500	50.0	250	25.0
2010-2011	400	40.0	200	20.0
2009-2010	300	30.0	150	15.0
2008-2009	200	20.0	100	10.0
Total	2,000	100	1,000	100

As shown in Table 10, the number of households with refrigerators and air-conditioner were increasing each year. Most of the respondents acquire units in the year 2012 - 2013. This implies that more households are acquiring RAC units every year.

Problems of the Shop Owners

Table 11: Problems of the Shop Owners

Problems	f	Rank
Capital	13	2
Hard to comply the TESDA accreditation	12	3
No free seminars available in the province	8	7
Unavailability of parts and materials in the province	16	1
Low voltage supply and fluctuation		
Punctured evaporator	5	8
Burn-out motor compressor	10	5
No training centers for technicians	9	6
	11	4
*Multiple Response	Total	84

As depicted in Table 11, among of the 8 identified problems met by the shop owners, “unavailability of parts and materials in the province” got the highest frequency of 16 or 19.05 percent followed by “capital” with a frequency of 13 or 15.48 percent and “hard to comply the TESDA accreditation” with 12 or 14.28 percent. This indicates that most of the shop owners got the problem on unavailability of parts and materials to be used in repairing RAC units.

CONCLUSIONS

The shop owners were at the middle age, male dominated, married, college graduate, TESDA certified and all of them had not attended any training/seminars related to refrigeration and air conditioning.

The status of refrigeration and air conditioning shops in Biliran province was moderately adequate, the tools and materials were also moderately available. The personnel of RAC shops were not sufficient, accessible to. They had capital of 10, 000 and below, shops were not TESDA accredited and most of them had no license to operate the business. Shop owners had linkages to the households, local government while others had no linkages at all.

The demand for manpower in the refrigeration and air conditioning had increased the number of household with refrigerators and air conditioning.

The problems of shop owners lies on the unavailability of parts and materials in the province while some of them had to comply the TESDA accreditation.

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