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Investigation into Safety Practices by Automobile Mechanics at Siwdo Kokompe

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ABSTRACT
Education on occupational safety is geared towards ensuring that injuries on workers during the performance of their duties are either eliminated or reduced to the barest minimum. Thus the Automobile Mechanics at Siwdo Kokompe must be educated on implementation and improvement of mandatory job safety, standard, shop regulation and accident prevention.
Furthermore, they must use tools according to manufactured specifications; locate the devices and hazardous substances safely. Siwdo Kokompe was chosen because of the large cluster of automobile artisans there. Qualitative and Quantitative data was obtained using interviews for twenty three mechanics which represents 99% of the mechanics. This research reveals conclusively that there must be intensive education on the use of safety wears, fire extinguishers and ventilated rooms and also on the non-usage of faulty equipment/tools. Conclusively there is the need for education on safety and some tools.
Keywords: Automobile Mechanics; Safety; Tools; Injuries; Servicing

INTRODUCTION

Industrial safety in general is the concern of the wellbeing of workers in the course of performing their duties. Also in Ghana, lack of interest in industrial safety has resulted to industrial disasters. The automobile mechanics at Siwdo Kokompe must be made aware that observing regulations at their shops will prevent accidents and therefore shop safety, personal safety as well as emergency procedures is very important regardless of experience. Throwing more light and documenting safety conditions at Siwdo Kokompe will ensure continuous improvement in availability and non-usage of safety gargets.
Furthermore, occupational safety will be ensured and disasters reduced drastically for the automobile mechanics at Siwdo if mandatory job safety standards are implemented and continuously improved. Thus the right tools must be used, instructions properly followed and mandatory use of safety gargets. There have not being massive as well as intensive education of any form on safety practices for these mechanics. Fatigue and lack of time management are some of the factors responsible for accidents and injuries as well as low productivity. No or poor maintenances of tools and equipment may also result in accidents and injuries. The common injuries are cuts, wounds, burns among others. The objective of this article is to investigate into safety practices by automobile mechanics at Siwdo Kokompe.

REVIEWED LITERATURE

History and location of Siwdo-Kokompe in Cape Coast

Automobile artisans working on all aspects of automobile were formally located at the present day Ewim Nurses Flat at Kotokoraba in the Central Business Centre of Cape Coast in the Central Regional Capital. At that time, the area has seen springing up of cluster of workshops for craftsmen who do various types of repairs and services on automobile. At this location there were shops selling everything on automobiles. These craftsmen or artisans are automobile electricians, sprayers, vulcanizes, welders (gas and arch) and mechanics.
These workers were relocated in the year 1968 to present and premised at Siwdo Kokompe to pave way for the construction of the Ewim Nurses Flat. The Siwdo Kokompe cluster of craftsmen is located between the Adisadel Estates and the Robert Mensah Sports Stadium, thus on the right side of the John Mensah Sarbah dual carriage road when going to the stadium from the Pedu Junction. Finally, a little over 40 shops were found at Siwdo Kokompe but now close to 200 shops can be seen at the place including machine shops, wind screen repair shops upholstery shops, blacksmith shops and iron casting shops.
Light and heavy duty automobile mechanics as well as specialized automobile mechanics were also located at Siwdo Kokompe. The specialized mechanics include automatic gear box specialist, carburetor specialist among others. On the average, about 300 vehicles visit Siwdo Kokompe on daily basis for all types of repairs. The activities at Siwdo Kokompe is said to be the main factor for the pollution of the Fosu Lagoon. These activities

are welding, spraying, automobiles electrical works, automobiles mechanical works, fabricating, vulcanizing, blacksmithing among others.

Automobile Mechanic Practices at Siwdo Kokompe in Cape Coast

Mechanically, the automobile consist of many different parts that work together to provide motion. The basic components of the automobile are engine, chassis, drive train and body. Servicing of automobiles at Siwdo-Kokompe involves the function of effective regular maintenance. The mechanical maintenance practices involves the care and up keeping of the mechanical parts according to schedules. These procedures or activities are oil and filter changing belt and hoses replacement, tune-ups, lubrication among others. The repairs are re-fixing of new parts, bolts, nuts among others.

Safety Practices that must be done at Siwdo Kokompe by the Automobile Mechanics

The common elements or factors of safety to be noted and practices by the mechanics at Siwdo Kokompe are:

i) Shop layouts and proper location of safety devices
ii) Proper usage and safe handling of the following:
    a. Power Tools
    b. Compressed Air
    c. Hydraulic Jacks and Hoist
    d. Jack Stands
    e. Chain Hoists and Cranes
    f. Exhaust Gases from running Engines
    g. Equipment Defects and Misuse
    h. Fire Prevention
    i. Fire Extinguishers
    j. Special Precautions.

Shop Layout and Location of Safety Devices

The Automobile Mechanics at Siwdo Kokompe must have proper layout of their shops. Thus the layout must show assignable areas or locations of work, equipment and tools, work benches, lifts, hoists, offices and restricted storage rooms. The floors must be marked with coloured paint lines indicating dangerous areas, emergency areas among others. Also there must be instructional as well as special signs for warnings and operations of specialized trained equipment. These signs and markings must show the locations of all types of existing fire extinguishers and their usage, telephones, first aid kits among others. There must also be warning signs on walls for avoidable hazards and no horse plays.

Hand Tools

These mechanics use tools such as screw drivers, hammers and wrenches which are also known as hand tools. Thus they are operated by the power of the hand. These are commonly used tools so they must be carefully handled.

These mechanics must keep their hands clean, clear and dry before using such tools otherwise when the tools shift and fall on moving or non-moving parts they can fly and cause injuries. Usage of wrong, broken and bent tools can cause damage to parts, the tools themselves and human.

Power Tools

These mechanics use tools which make use of power from external sources such as electrical power, compressed air and hydraulic pressure as a result they are called power tools. As such their operation must not be careless and safety glasses or face shield must be used. Operational instructions of these tools must be properly followed. They must be checked for good conditions and protective covers must be provided for safety where necessary. Protective covers or safe guards must cover moving parts and keep all hands as well as loose clothing away from moving parts. When these tools are not in use, the mechanics must turn them off and disconnect the source of power.

Compressed Air

Some tools are powered by air under pressure directed through hoses. Such an air is referred to as compressed air. When these mechanics are using these tools they must wear safety glasses or face shield since the compressed air may blow dirt, metal pieces or glass particles into their eyes resulting into injuries. Also they must check all connections, nozzle looseness and they must not use the air for any form of cleaning.

Hydraulic Jacks and Hoist

Some of the Automobile Mechanics at Siwdo Kokompe use the hydraulic jacks to permanently support automobiles at heights relative to normal human heights. Most of them use jacks to raise the automobiles before working under. Caution must be taken by them with respect to the jack and hoist manufacturers' instructions before using them. Also they must close all doors, boots, trunk lids and apply the appropriate gears and brakes. Nobody must be in the vehicle before jacking or hoisting. Nobody must be under an automobile before they do jacking hoisting and appropriate locking devices must be applied just after jacking or hoisting. They must also use jack stands or safety stands as extra support after jacking or hoisting.

Chain Hoist and Cranes

These mechanics service many engines whiles they are running at different speeds resulting in emission of dangerous gases. They must provide exhaust emission system for enclosing shops since most of them operate in enclosed shops which are not ventilated and they must also direct the exhaust outside these shops. They must also put gears in appropriate positions. All the above instructions are necessary because these engines emit exhaust forms that contain carbon monoxide and other poisonous fumes that are very harmful to humans. When handling harmful chemicals such as acids, paints and hot liquids which can cause damage to clothing, skin, and eyes, these mechanics must wear safety glasses or face shields, gloves and long sleeves, overalls or coats or shop aprons.

Equipment Safety

These mechanics must make sure that fans, belts, pulleys, grinders, chains and other energy transmission devices are properly covered with guards. All electrical connections must be properly insulated to prevent fire and electrocution.

Fire Prevention and Fire Extinguishers

These mechanics are to keep liquids funnels, solvents, paints and other combustibles in fire proof containers which must also be kept in restricted rooms or areas. These rooms or areas must be marked "no smoking" or "no fire" since the combustibles may explode or ignite easily. These fire proof containers must not be breakable containers and evaporation must not occur from them. The mechanics must clean off any spilled combustibles from the floor with dry rags and dry them outside the shops where there is no naked fire. They must provide all types of fire extinguishers at many locations and every worker must be educated on the use of such extinguishers.

Special Precautions

Before testing vehicles, they must test the breaks first. They the mechanics must make sure that nobody, tools and equipment are under the automobile. They must put on safety belts and drive at appropriate speeds.

Safety Precautions to be done during Servicing by the Automobile Mechanics

These mechanics must properly raise supports and secure the tires on the ground properly before changing engine oils and oil filters in order to prevent the automobiles from moving. Hot oil drained may cause injuries in contact with the skin, so face shields, gloves and overalls must be put on. In order to prevent burns from signs such as hot manifolds, pipes and mufflers, writing signs such as keep off, “danger” or “hot surfaces” must be placed at such surfaces. The mechanics must stop the practice of opening radiator caps when coolants are hot since the hot pressure coolant can gush and splash out to cause burns. They must not wear loose dresses and jewelry since they can enter moving parts to cause injuries.

Ethylene glycol in anti-freeze is poisonous and inflammable so the mechanics must be careful when handling antifreeze fluids. Fans driven by electric motors are automatic in starting, so the mechanics must switch off the source of power or disconnect them before working on them or around them. When checking leakages as well as working on fuel system servicing of automobiles, these mechanics must make sure the shops are well ventilated. They must also make sure that appropriate fire extinguishers are available and naked fire is not around them, furthermore, they must wear face shields, rubber gloves and appropriate overalls. All the above protective wears must be put on by these mechanics when hammering. Since batteries contain harmful sulfuric acid, electrolyte, the automobile mechanics working around them must wear face shields or protective goggles, rubber gloves, overalls and must keep enough fresh water near them to clean off any acid spillage on them. They must not wear jewelries to avoid electrocution or explosion whenever there is contact with battery terminals. They must not fill the batteries to avoid electrolyte spillage and must remove or disconnect the ground terminal of the battery. To prevent breathing of fumes or particles, they must wear nose mask or any nose breathing protection devices. They must not touch high energy cables, keep hands as well as arms away from moving belts and pulleys. They must remove and replace electrical units when no power sources are connected to the circuits whiles all switches are put in off position. When servicing emission control systems, they must not wear long sleeves, watches and jewelries. These mechanics must allow the exhaust system to cool completely before any of services are done on them.

During inspections, they must move their hands and fingers slowly around the edges and use shop rays when lifting or moving parts. They must be properly educated on power mechanics before their usage in order to avoid injuries. And loose parts must be firmly supported. Safety goggles or face shield must be worn before working under vehicles. There is asbestos fibers in the clutch and break assembly systems which is dangerous to human health. These mechanics must use special vacuum dealers to remove dust from the assemblies so that no asbestos fibers get to the atmosphere to be breathed to cause health hazard. The servicing areas of clutch assembly must be well ventilated and breathing mask must be worn before such services are done. Before the servicing, the automobile must be raised and supported by jack stands or hoists. During testing nobody must stand in front or behind the automobile. Also before servicing automatic transmissions, the automobile temperature must cool down completely, disconnect the ground terminal before doing this servicing as well as servicing of axles. When these mechanics are servicing differential and driving axles, they must be careful to avoid cuts by sharp objects.

Whiles servicing suspension systems, they must keep their hands and fingers away from parts since the parts can move any time and may cause servicing injuries. When they are working around or on engines fan assembly, they must remove the ground terminal of the battery. They must replace any damage parts of the steering but they must not straighten or connect any such parts. The mechanics must allow the vehicles to cool down completely before working on or around the steering system since hot parts and fluids can cause accidents and burns. All testing after servicing can cause accidents so the mechanics must do them carefully. For servicing of alignment, they must work carefully since they work in light areas around the wheel. They must tighten fasteners in accordance with the manufacturer’s recommendations. They must mark fires appropriately and all balancing attachments must be securely tightened as well as safety guards properly fixed. They must wear safety goggles or face shields before replacing rotor and also clean all rotors properly before training.

Safety Wear

All the work involved in the profession of automobile mechanics at Siwdo Kokompe in Cape Coast leads to handling dangerous and hazardous substances. These are sharp and heavy metals, oils, chemicals among others. Therefore there is the need for these mechanics to wear properly manufactured safety wears to protect them against all these dangers of cuts and burns resulting from the handling of such materials. These protective wears include:

a) Safety Boots
b) Overalls and Aprons
c) Hand Gloves
d) Safety Glasses or Face Shields
e) Earplugs and Filter or Mask Respirators:

Safety Boots

These are recommended boots for automobile mechanics. They have steel tipped front end which protect the toes from hot sparks or falling objects. The soles under are made of tough rubber which prevent shipping when the floor is oily and electrical shocks when live wires and stepped on. The top and sides of these boots which covers the steel at the tip is made of hard leather which is liquid proof. Due the fact that automobiles mechanic practices require the handling of heavy objects, these boots are needed for feet protection.

Overalls and Aprons

These protective clothing are normally made of natural thick fiber or cotton. They do not have loose long sleeves and protect the human body against radiations from hot fluids (hot radiator water and hot lubrication oils), sulphuric acids from batteries and other hazardous substances.

Hand Gloves

These are made up of leather or rubber that is tough and liquid proof. The leather or rubber is resistant to chemical corrosion. The lining of these gloves are rubber in order to protect their hands against sharp cuts, corrosion, burns, toxics, contaminations and other injuries. They are tough penetrative resistant transparent plastics. Pure glasses are not recommended since they crack and damage the eyes if they are hit by flying objects. These devices have either supporting metal or plastic frames. These devices protect the eyes of these mechanics from the damage of grinding practices, dust, filing metal practices, scratches, pressured fluids and corrosion.

Earplugs and Filter or Mask Respirators

Earplugs or mufflers are recommended and specially manufactured devices that protect the ears of the automobile mechanic against loss of hearing, noise and pollutants. Example is the silicon ear plug. These mechanics must wear respiratory safety devices to protect them against breathing of toxic exhaust fumes, asbestos, dusty chemicals and tiny metal practices that cause respiratory illness.

METHODOLOGY

This research was done at Siwdo Kokompe because it is largest clutter of artisans (automobile mechanics) in the Cape Coast metropolis in particular and Central Region as a whole. As a result, collection of qualitative and quantitative data for analysis to substantiate this conclusions or claims makes it possible for the research to see the light of the days. The methodology adopted for the research was the quantitative approach since substantive analysis, conclusions and recommendation must be made to signify that there is the need for intensive safety education for these automobile mechanics. Therefore, this data collection and analysis was the most efficient means of making this research a reality, definitely the target group for this research was the automobile

mechanics at Siwdo Kokompe. This method involves the use of structured questionnaires and interviews. In all, 23 questionnaires were administered representing 98% of these mechanics.

Table 1A: Automobile Mechanics Shops at Siwdo Kokompe and Corresponding Names of Shop Masters

SHOP NAME	SHOP MASTER'S NAME
.KYESO NYAME	DANIEL INKOOM
OBENG BOAT VENTURES	MASTER OBENG
SHALOM FITTING	HARISON ATULINYAH
OBEN FITTING SHOP	MR. OBEN
YESU ADOM FITTING SHOP	MASTER SOLO
OFIR NYAME FITTING	JOSEPH ESSIEN
EKOW ACKOW FITTING SHOP	EKOW ACRON
OPPONG FITTING SHOP	MASTER OPPONG
TONY MOTORS	ANTHONY ACKONGOODE
BONNY FITTING SHOP	GEORGE BONNY
OPPONG DANKWA FITTING SHOP	OPPONG DANKWA
ABU FITTING SHOP	MASTER ABU
MASTER KWAME FITTING SHOP	MASTER KWAME
DABI WO BE KAE ME	MASTER KOFI
NII FITTING SHOP	MASTER NII
AMEEN FITTING SHOP	AMEEN ALHASAN
RANSFORD FITTING SHOP	MASTER RANSFORD
GYE NYAME MOTORS	PHILIP WIREDU
KWEKU BADU FITTING SHOP	KWEKU BADU
CHRISTIAN MOTORS	MASTER CHRISTIAN
MAWULI FITTING	MASTER MAWULI
IF GOD IS FOR US NO ONE IS AGAINST US	MASTER PEE

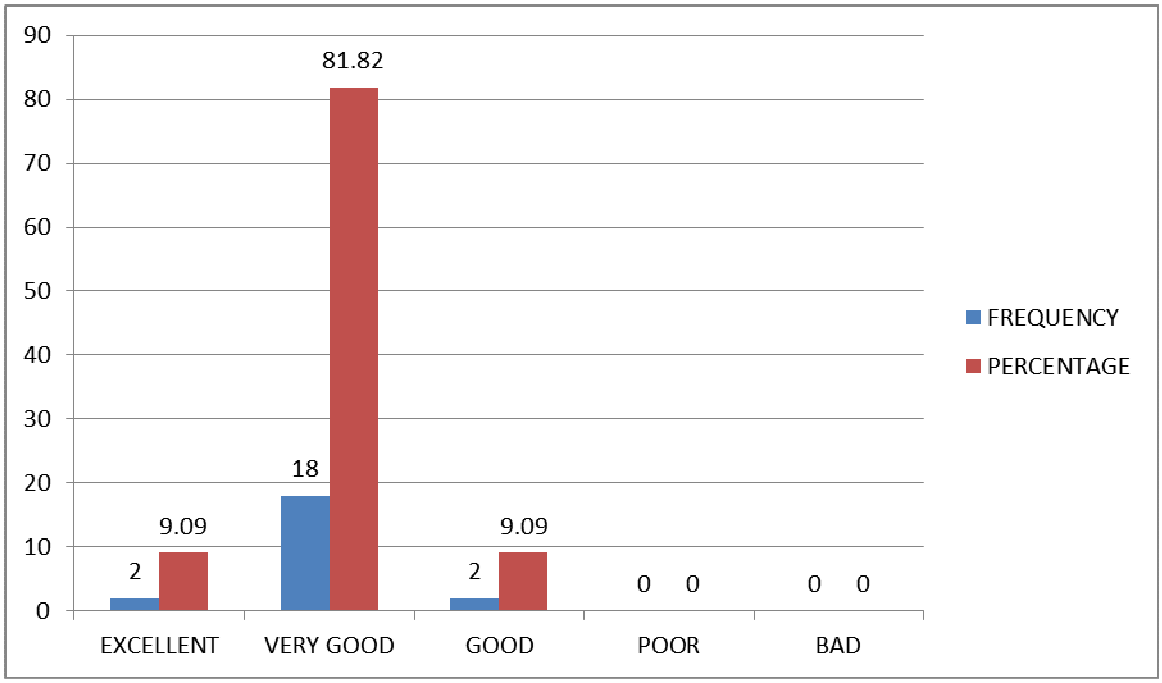
Source: Author's Field Work (2012)

Table 1B: Right Tools Analysis

ISSUE	RESPONSE	FREQUENCY	PERCENTAGE
RELATIVE ANALYSIS OF THE RIGHT TOOLS	EXCELLENT	2	9.09
	VERY GOOD	18	81.82
	POOR	0	0
	BAD	0	O
	GOOD	2	9.09

Source: Author's Field Work (2012)

Figure 1B: Right Tools



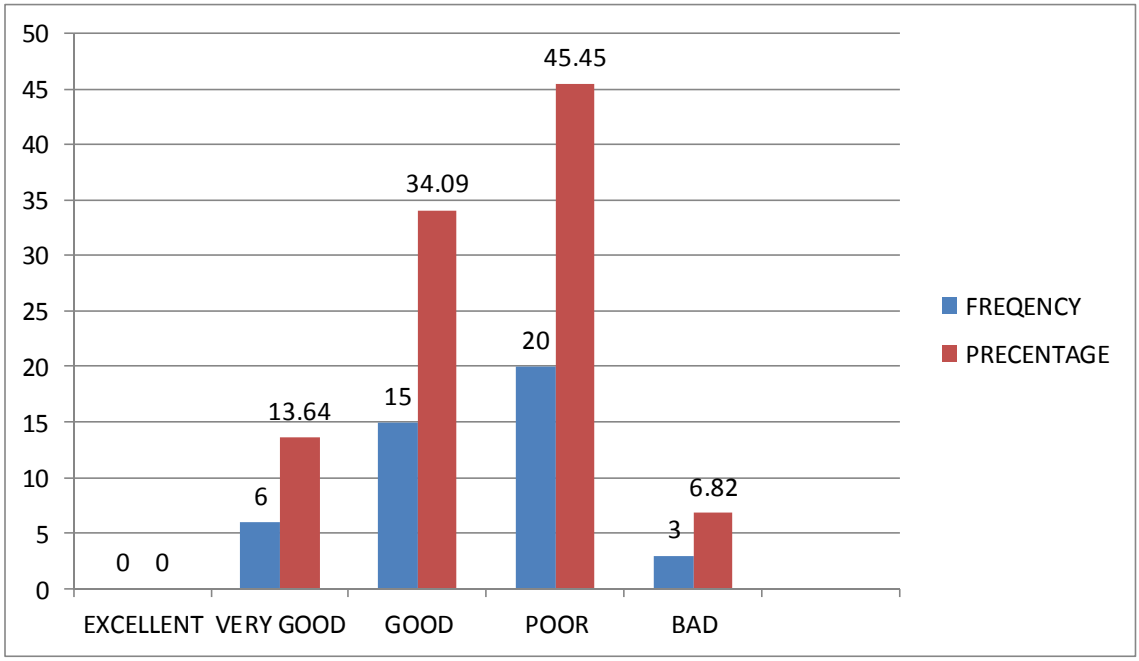
Source: Author's Field Work (2012)

Table 2: Helmets and Guards Covering Moving Parts Analysis

ISSUE	RESPONSE	FREQUENCY	PERCENTAGE
ANALYSIS AND USES OF THE HELMENTS AND GUARDS COVERING PARTS.	EXCELLENT	0	0
	VERY GOOD	6	13.64
	GOOD	15	34.09
	POOR	20	45.45
	BAD	3	6.82

Source: Author's Field Work (2012)

Figure 2: Helmets and Guards Covering Moving Parts



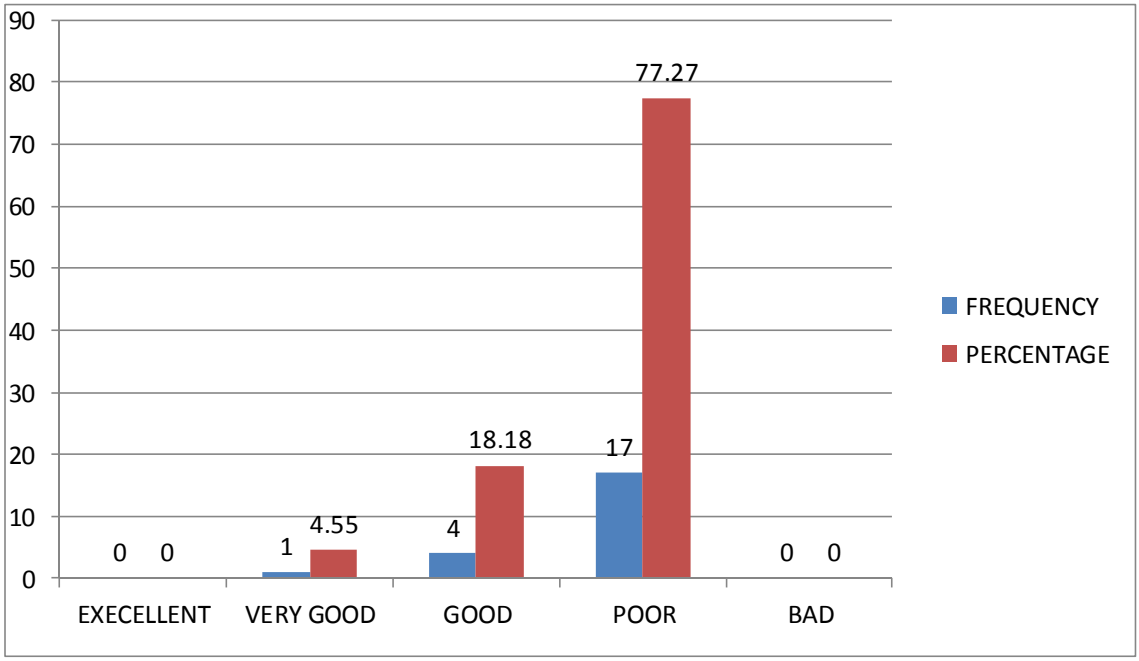
Source: Author's Field Work (2012)

Table 3: Fire Warning Signs

ISSUE	RESPONSE	FREQUENCY	PERCENTAGE
ANALYSIS OF FIRE WEARING SIGNS	EXCELLENT	0	O
	VERY GOOD	1	4.55
	GOOD	4	18.18
	POOR	17	77.27
	BAD	0	0

Source: Author's Field Work (2012)

Figure 3: Fire Warning Signs



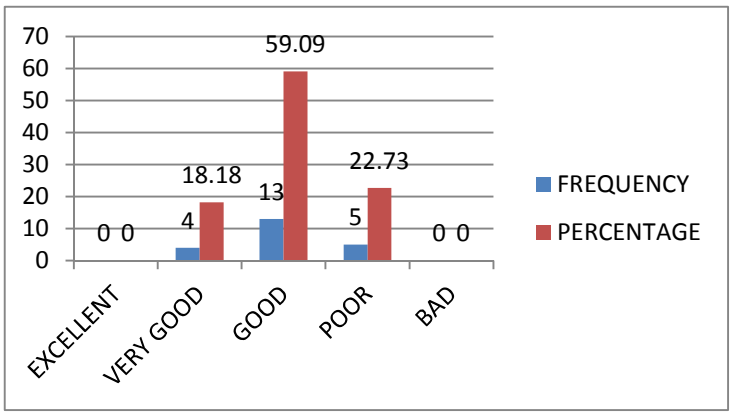
Source: Author's Field Work (2012)

Table 4: Restricted Areas or Rooms Analysis

ISSUE	RESPONSE	FREQUENCY	PERCENTAGE
ANALYSIS OF RESTRICTED AREAS OR ROOMS	EXCELLENT	0	0
	VERY GOOD	4	18.18
	GOOD	13	59.09
	POOR	5	22.73
	BAD	0	0

Source: Author's Field Work (2012)

Figure 4: Restricted Areas or Rooms



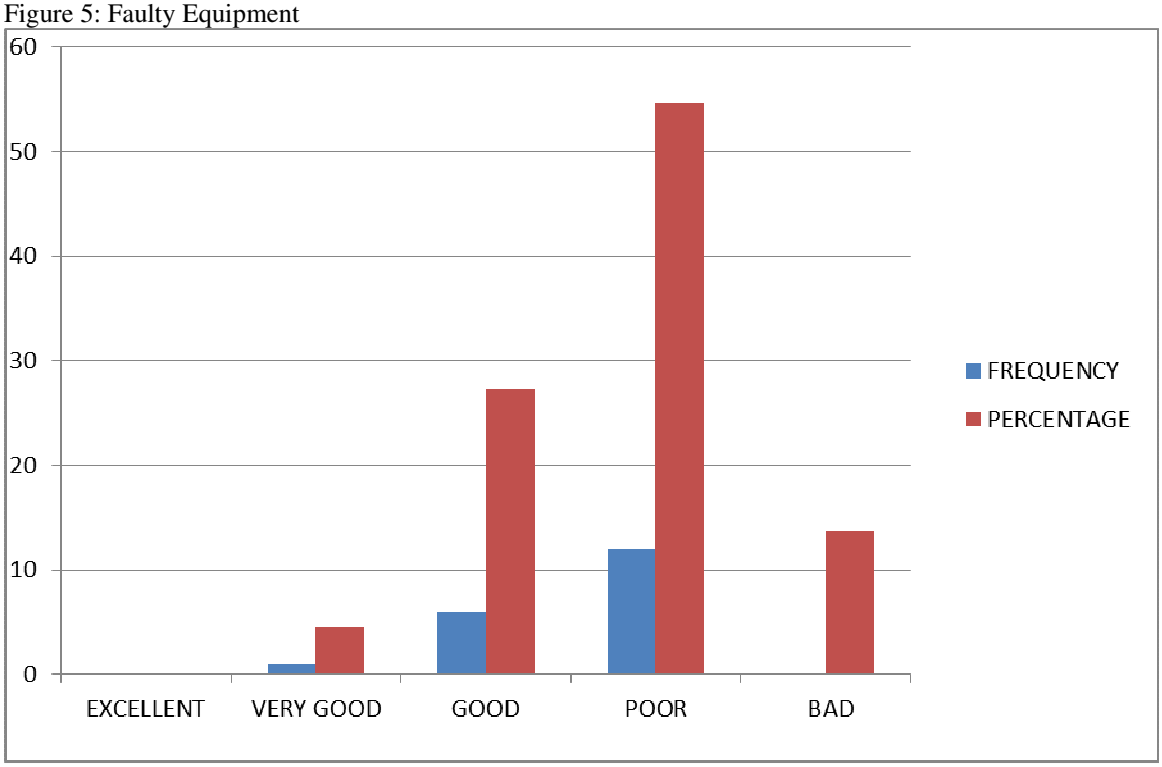
Source: Author's Field Work (2012)

Table 5: Faulty Equipment Analysis

ISSUE	RESPONSE	FREQUENCY	PERCENTAGE
ANALYSIS AND USAGE OF FAULTY EQUIPMENT	EXCELLENT	0	0
	VERY GOOD	1	4.55
	GOOD	6	27.27
	POOR	12	54.55
	BAD	3	13.66

Source: Author's Field Work (2012)

Figure 5: Faulty Equipment



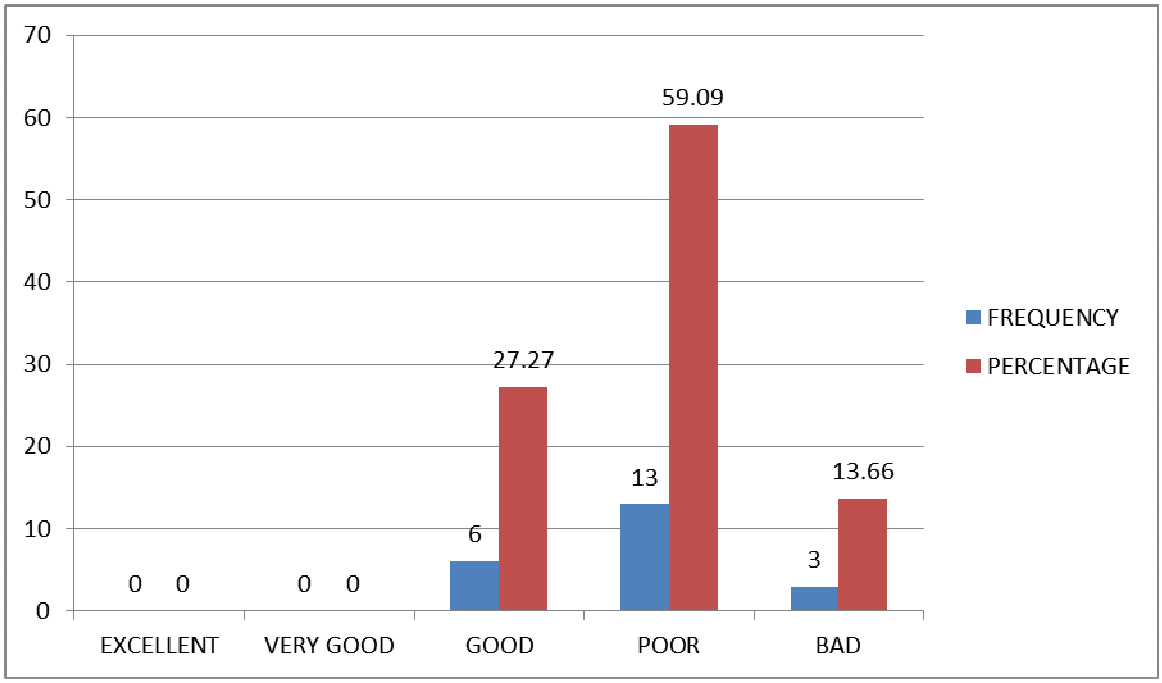
Source: Author's Field Work (2012)

Table 6: Well Ventilate Rooms Analysis

ISSUE	RESPONSE	FREQUENCY	PERCENTAGE
ANALYSIS OF WELL VENTILATED ROOMS	EXCELLENT	0	0
	VERY GOOD	0	0
	GOOD	6	27.27
	POOR	13	59.09
	BAD	3	13.66

Source: Author's Field Work (2012)

Figure 6: Well Ventilated Rooms



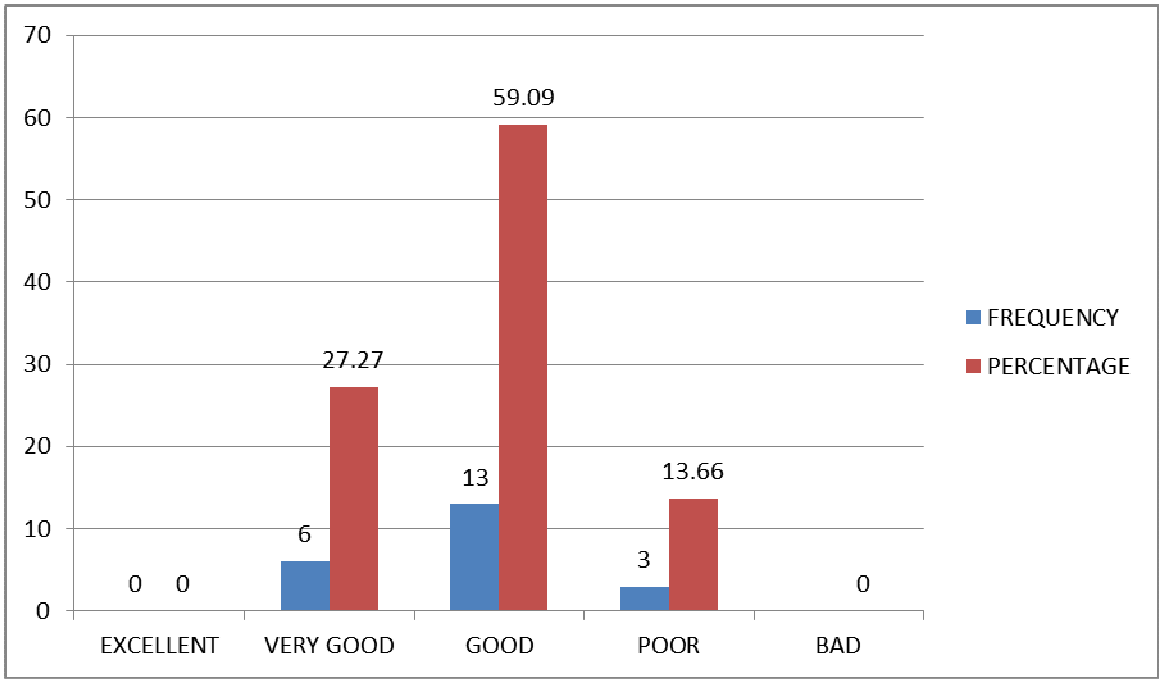
Source: Author's Field Work (2012)

Table 7: Equipment/Tools Cleaning Analysis

ISSUE	RESPONSE	FREQUENCY	PERCENTAGE
EFFECTIVE CLEANING OF EQUIPMENT/TOOLS BEFORE USING.	EXCELLENT	0	0
	VERY GOOD	6	27.27
	GOOD	13	59.09
	POOR	0	13.66
	BAD	0	0

Source: Author's Field Work (2012)

Figure 7: Equipment / Tools Cleaning



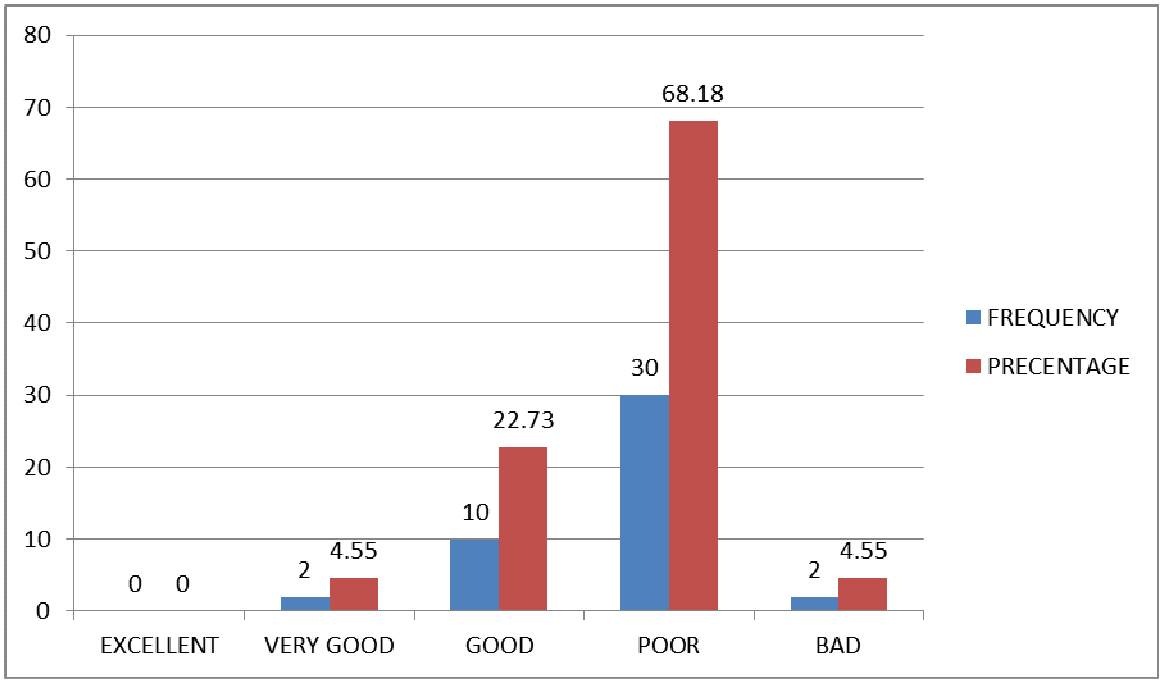
Source: Author's Field Work (2012)

Table 8: Goggles and Ear Plug usage Analysis

ISSUE	RESPONSE	FREQUENCY	PERCENTAGE
ANALYSIS AND USAGE OF GOGGLES AND EAR PLUG.	EXCELLENT	0	0
	VERY GOOD	2	4.55
	GOOD	10	22.73
	POOR	30	68.18
	BAD	2	4.55

Source: Author's Field Work (2012)

Figure 8: Goggles and Ear Plug usage Analysis



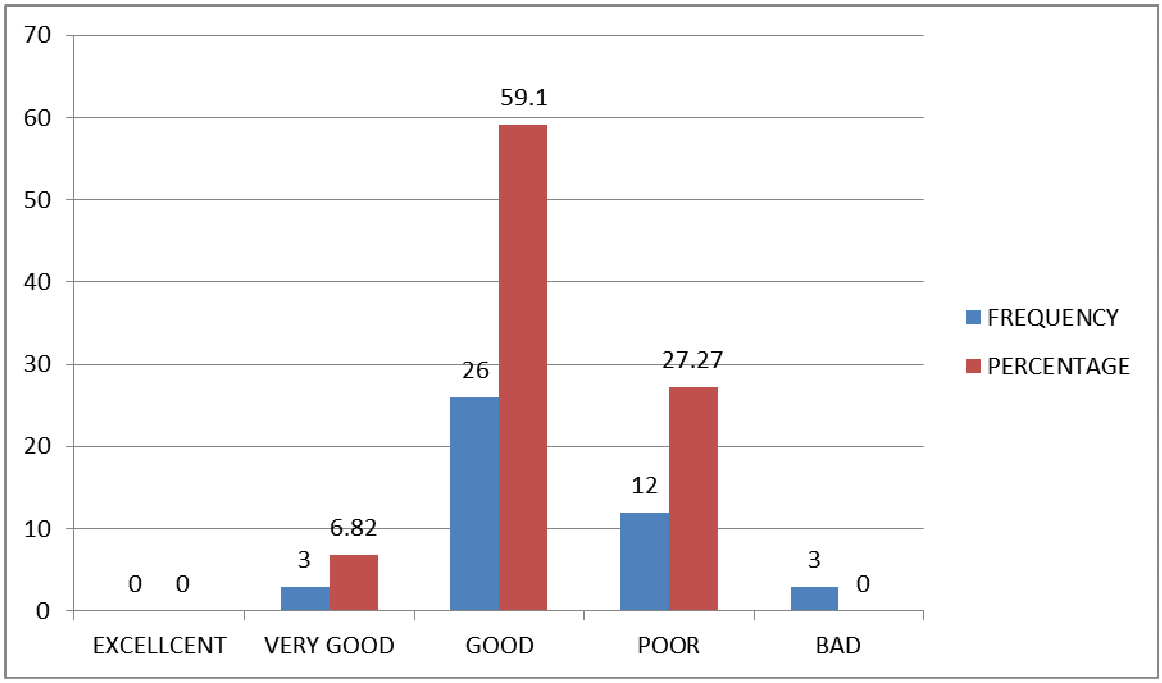
Source: Author's Field Work (2012)

Table 9: Gloves and Safety Boots usage Analysis

ISSUE	RESPONSE	FREQUENCY	PERCENTAGE
ANALYSIS AND USAGE OF GLOVES AND SAFETY BOOTS	EXCELLENT	0	0
	VERY GOOD	3	6.82
	GOOD	26	59.01
	POOR	12	27.27
	BAD	3	0

Source: Author's Field Work (2012)

Figure 9: Gloves and Safety Boots usage Analysis



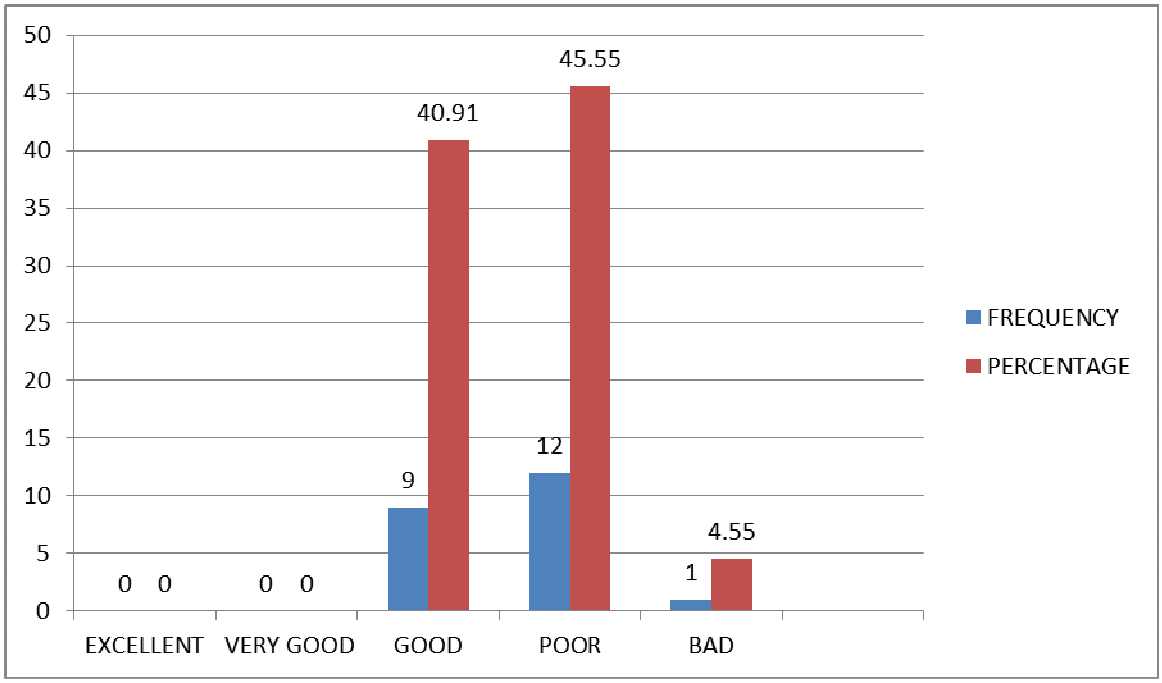
Source: Author's Field Work (2012)

Table 10: Fire Extinguishers Analysis

ISSUE	RESPONSE	FREQUENCY	PERCENTAGE
ANALYSIS AND USAGE OF FIRE EXTINGUISHERS	EXCELLENT	0	0
	VERY GOOD	0	0
	GOOD	9	40.91
	POOR	12	45.55
	BAD	1	4.55

Source: Author's Field Work (2012)

Figure 10: Fire Extinguishers



Source: Author's Field Work (2012)

DISCUSSION

Initially the survey focuses on the right tools because the use of wrong tools contributes significantly to the causes of injuries (burns and cuts). But the results of the survey reveal that 51.85% of the tools used are the correct ones. According to the survey the use of helmet and guards covering moving parts have 45.45% poor condition and 43.09% good. Fire warnings signs gave 77.27% poor and 18.18% good. Restricted areas or rooms have 59.09% good and 22.73% poor. The availability of faulty equipment saw 54.55% good and 27.27 poor. The survey shows that there is 59.09% good and 27.27% for equipment/tools cleaning. Referring to goggles and ear plugs, the survey indicated that there was 68.18% for poor and 22.73% good. The author's field survey work shows that gloves and safety boots saw 59.01% poor and 40.91% good.

CONCLUSION

This research can firmly conclude that the conditions that the right tools were used were very good for almost all the automobile mechanics at Siwdo Kokompe in Cape Coast. The wearing of helmets and safety guards are poor and slightly good with no excellent. Conclusively, the condition of fire warning signs were largely poor with only a small goodness provision of restricted areas or rooms was averagely good and fairly poor. Half of the faulty equipment were in poor conditions, whiles a fair number of them were also good and bad. More than half of the well ventilated rooms are not ventilated and only a small fraction is in relatively good condition. The practice of cleaning equipment/tools before using is good and very good for greater proportion of these mechanics with only small fraction doing this properly. The wearing of protective goggles and ear plug was in the category of poor and bad for most of them with relatively smaller number of them are very good and good in the using of gloves and safety boots. This practice is poor and bad. Conclusively, the use of fire extinguishers was poor and bad.

RECOMMENDATIONS

As a result of information gathered and conclusion arrived at during this research, the following recommendations are made below:

Education must be intensified on the following:

a. The continuous usage of the right tools
b. Immediate and serious improvement in use of helmet and covering guards for moving parts

c. Provision of fire warnings signs, restricted areas or rooms an well ventilated rooms
d. Avoiding the use of faulty equipment and proper cleaning of equipment/tools before usage
e. Wearing of goggles, earplugs, gloves and safety boots
f. Proper usage of fire extinguishers

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