Occupational health and safety in garages

T. Ghebreyohannes
ERITREA

Background
Garage work is not a new occupation in Eritrea. It was introduced during the Italian colonization. Garage work can be divided into three categories, based on the type of machinery or equipment used and the number of workers employed. For instance, some garages are well-equipped establishments with 100 or more employees while other garages are very small, involved mainly in selling fuel and making minor repairs and employing one or two workers. There are also garages run by family workers only. Aside from these establishments, there are garages in the informal sector.

Garage work is an important source of job creation in Eritrea. Apart from creating jobs directly, garages have a number of unique advantages, providing potential for improving skills and devising new technology. At present in Eritrea, various trials developing new technological innovations are in progress. Most of these innovations come from people working in different types of garages. There are several central reasons why this happens mostly in garages: The relationship between workers and managers is closer, owners often work on the shop floor, and they are able to adopt innovative, informal and flexible approaches to solve problems. This sort of work relationship fosters good co-operation among workers and employers, creates a conducive work environment for understanding technological problems, and promotes informal and flexible approaches to problem-solving.

Introduction
A survey was conducted in order to assess working conditions at garages, paying special attention to workers’ occupational safety and health (OS&H). OS&H standards in the garages were paid particular attention because garages account for a high and growing share of urban employment, they have inadequate safety and health guidelines, and there are easily applicable and practical solutions that can help a large number of people at relatively low cost. The purpose of this survey was to identify safety and health hazards in garages, to recommend appropriate engineering and administrative control measures, and to identify the correct personal protective equipment (PPE).

Methodology
The methodology applied during the survey was field observation, and involved interviewing technical persons and garage workers on the basis of a prepared questionnaire or checklist. The questionnaire was divided into five occupational hazard categories: 1) fire and explosion; 2) chemical agents; 3) mechanical hazards; 4) physical or electrical hazards; and 5) ergonomic hazards. The use of personal protective equipment was also determined.

Study findings
The survey indicated that many activities and much equipment pose a wide range of risks and hazards. Risks and hazards were identified in: 1) car mechanical and electric repair work (engine overhauling; automobile electricity repairs and battery charging, mechanical repairs of vehicles and motorcycles and rare suspension repairs); 2) body repair activities (body repair work, metal painting and surface treatments); and 3) maintenance services (car washing and greasing, wheel alignment and other services, such as seat repairs) (1).

When performing the above activities, garage workers used a variety of tools and equipment, including cranes, jacks, hydraulic platforms, portable electric drills and lamps, small machine tools, hand tools, a compressed-air system, welding equipment, an inspection pit, a painting booth and organic and inorganic (chemicals) solvents.

The survey found that in large and well-organized establishments, work areas and working personnel are clearly separated. Risks are easier to control and fewer workers were exposed to occupational injuries and illnesses. By contrast, when all types of garage work were carried out in a single room, more workers were exposed to all of the hazards because under these circumstances it was difficult to introduce preventive measures.

Identified fire and explosion risk
Fire and explosion – not only conflagration but, more often, small incidents involving grave personal injuries – are ever-present hazards. Many injuries were caused by the accidental ignition of petrol-soaked clothing or gasoline vapours. The high volatility and high flammability of these petroleum fuel products, in particular, and products with a low boiling point (such as motor
gasoline and kerosene) create dangerous situations. Some of the workers interviewed said that the risk of fire and explosion occurred in garages during high-pressure gas welding. Both oxygen and fuel gas (acetylene) are supplied to the torch from the cylinders in which they are stored under high pressure.

Preventive measures for fire and explosion

Various methods or techniques are recommended to prevent fire and explosion in garages. The first and most important method is to introduce a high standard of ventilation and cleanliness, as these keep the petroleum vapour concentration in the workplace air at a level 20% below the explosive limit (2).

It is also necessary to control spillage of petroleum products. To eliminate sources of ignition, electrical installation and equipment should be flameproof. Rags and waste should be placed in metal rubbish bins with self-closing covers. Great care is necessary whenever welding or cutting is carried out. No work should be done on tanks or other receptacles until they have been thoroughly purged of all inflammable vapours.

Workers should receive the necessary training in safe working methods and in the procedures to follow in case of fire. Last but not least, appropriate fire extinguishers should be ready to hand and fire exits are vital, as they help save human life and property during fire and explosion.

Occupational safety hazards identified

An occupational safety hazard was defined as any substance (raw material), machinery or equipment that could cause simple or serious injury leading to absence from work lasting at least 24 hours. The results of the technical inspectors’ observations, and the replies to the question: “Have you ever suffered any occupational injury caused by work or related to your work, and did you have any registered occupational injury in the past 6 months?”, are described below.

According to the observations and responses, no occupational injuries had been registered. However, workers working in engine overhauling, battery charging, welding (arc and gas welding) and mechanical repairs, (hazards related to equipment and tools, lifting machinery and tackle, electrical equipment, compressed air and the inspection pit) suffered from different occupational injuries.

The occupational injuries were found to be unevenly distributed over different sections in the garage work. More incidences of injuries were reported in mechanical repair, battery charging, welding, and painting sections.

The types of accidents were: acid burns to the hands and feet, severe dehydration, overexertion, amputation, injection, cutting, abrasion, broken hand or feet and eye injury. On the basis of the workers’ interviews and the field observations, the most common occupational injuries, with a high frequency, were abrasions, broken bones, fractures, cuts, acid burns, and eye injuries caused by flying objects.

The incidence of occupational injuries was more common among young workers between 21 and 35 years of age. Young workers with less work experience are more prone to accidents in garage work than older people with more work experience. Therefore, employers should pay serious attention to newly-recruited young workers right from the very beginning of their employment.

Occupational health hazards identified

An occupational health hazard was defined as a pathological condition, whether caused by physical, chemical or biological agents, which arises as a consequence of the work performed by the employee or the surroundings in which he/she works. This shall be considered an occupational illness (3).

The occupational health hazards identified in garages during the study included the organic solvents and inorganic chemicals used in cleaning or washing different engine parts, the recharging of batteries, the lead used in welding, the lead filler and molten lead used for filling cracks and dents. Outbreaks of sensitization dermatitis have been reported from the use of zinc chromate primers in preparing metal parts, especially in those rubbed down wet.

Workers engaged in painting activities were exposed to another health risk. In such activities, vehicle bodies damaged in car accidents are repaired, coated and painted. Various metal surface treatment processes are used: phosphating (coating with phosphate compounds), etching, electrolytic polishing, priming, plastic coating, electroplating, galvanizing, painting, and varnishing. This process involved working with a number of organic and inorganic chemicals that are a potential risk to workers’ health and safety. Depending on the degree and type of hazards, employers are obliged to introduce engineering and administrative controls as the first choice, and to provide appropriate PPE as a last resort, in order to protect workers from occupational health hazards.

Conclusion and discussion

The survey confirmed that garage workers are exposed to different occupational safety and health hazards. These exposures have different causes. They resulted in different occupational injuries and illnesses. However, further periodic medical surveillance of the diseases prevalent in garages is needed in order to verify that the illnesses were caused by occupational health hazards (4).

Most of the workers interviewed (39 out of 45) reported that improvements to their work environment are necessary in order to reduce the incidences of injury and illness. It was found, however, that most small-scale garage owners (garages with less than five workers) in particular do not invest money to improve their workplaces or the work environment. On the other hand, well-established and equipped garages were found to invest money to introduce engineering and administrative solutions as the primary means of preventing occupational accidents and diseases, and as the last resort, personal protective equipment (PPE) were provided for workers at no charge. The study indicated, however, that there was a lack of knowledge concerning the engineering controls introduced and selection of the proper PPE.

The respondents were able to mention some of the safety-related occupational health hazards, but they did not consider these hazards to be dangerous to their health or capable of causing a disease. Unsafe situations were evidently easier for workers and employers to identify than unhealthy situations (5). The survey found that most of the workers did not use the PPE provided by the employer, for different reasons. For instance, the PPE was uncomfortable (it might cause other accidents), it was not the correct type, it was not replaced on time, or the workers felt it was easy to work without the PPE. This is due to the lack of knowledge on occupational safety and health and PPE.

As far as employers’ knowledge of occupational safety and health was concerned, the results obtained indicated that only a few garages (9 out of 31) had set up occupational safety and health programmes. When asked “Why do you provide PPE for your workers?”, the
answers indicated that the aim was to prevent workers from occupational safety and health hazards. Another reason mentioned was that the employers had been instructed to do so by government inspectors. This result shows that the level of the employer’s awareness about occupational safety and health was not very high.

To overcome these discrepancies, the management should:
1. have sufficient knowledge of the hazards, correct methods of application and precautions needed with regard to each particular equipment and chemical or ingredient used. All essential information should be provided by the manufacturers or suppliers of equipment and chemicals.
2. ensure that workers receive proper training, are aware of the hazards and know how to avoid them.
3. provide proper protective equipment for each particular operation. In the painting process, for instance, there should be spray booths of the correct size and with adequate exhaust ventilation, as well as personal protective equipment such as gloves and the correct respirators for the materials involved.
4. supervise that there are adequate hygiene and correct procedures in the shop. This includes the cleaning of equipment and the hands and the provision of adequate washing facilities complete with soap and hot water.
5. have medical supervision for replacement and regular examination of workers.
6. use less hazardous substances in place of more hazardous substances.

In order to minimize the occurrences of occupational injuries and illnesses, workers in turn should:
1. know what is being used and how to use it properly and safely.
2. use safety equipment whenever it is needed.
3. ensure good housekeeping.
4. carry out their work on the basis of the training and instructions given by the employer.
5. notify the management of any observation that could lead to injury or illness.

References