

## **5.0 HEALTH AND SAFETY PERFORMANCE IN THE YEAR 2014**

During the year under review, the mine engaged the services of new Health and safety Superintendent to oversee the Health and Safety section of the Health, Safety, Environment and Community (HSEC) Department. The year 2014 closed with a total of nine (9) injuries. The nine was made up of three (3) lost time injuries, 3 medical treated injuries and 3 minor injuries.

These injuries as expected were at different parts of the body: 6 on the Hand/Fingers, 2 on the ankle/knee and 1 on the head/eye. Although the hand is used in most activities and thus the most exposed part of the body to hazards, it is imperative for the mine to drill down further on the root causes of the injuries to the hand and put in preventive actions. This will help minimize the maximum extent of future injuries to the hand of employees.

Monitoring performance, identifying emerging issues, addressing problems, reporting and evaluating, are also key elements of any safety programme. Operating a just culture where people are recognized and rewarded for their safe practices as well as holding them personally accountable, will bring management systems to life and bring the mine closer to a workplace free from harm.

The twelve months rolling Lost Time Injury Frequency Rate (LTIFR) at the close of the year 2014 stood at 1.94% as compared to 7.86% for 2013.

### **5.2 Safety Programmes Undertaken in the year 2014**

A number of programmes were held during the year in order to adopt a more proactive safety system of improving on the safety of the mine.

#### **5.2.1 National First Aid Competition**

The inspectorate division of the minerals commission in collaboration with the Ghana Chamber of Mines organised the annual first aid and safety competition. Although GMC did participate in the zonal, the company could not qualify for the final which was held at AngloGold Ashanti Iduapriem Mine. Golden Star Resources Wassa Mine came first as the best mine for the year 2014.

Before the competition, the mine was audited both internally and externally by the internal auditors and the IDMC respectively. The audit by IDMC was based on the provisions of LI 2182.

No major nonconformity was observed during the annual national mine audit. See plates 24 and 25 for GMC First Aid Team and a cross-section of Officials of the MINCOM respectively.

*Plate 24: Showing GMC First Aid team*



*Plate 25: Showing cross-section of Officials of the MINCOM*



### 5.2.2 Training

The mine's routine induction and review trainings were conducted on weekly basis. Over 2000 trainings were conducted for employees and contractors on various modules. Plans are far advanced to ensure trainings in 2015 on Standard Operating Procedures (SOP) that have been developed for respective departments.

### 5.2.3 Incidents

As indicated in Figure 3.0 above, 52 incidents were recorded during the reporting period; the breakdown being 9 injuries and 33 property damages and 10 near misses. All the incidents were investigated and corrective actions recommended. The corrective actions recommended were followed up to ensure conformance to prevent reoccurrence. As part of the preventive actions, tracking of Planned Task Observation conducted by supervisors was intensified. Reports on various reportable incidents were submitted as required by law.

### 5.2.4 Emergency Response

The Emergency Response Team (ERT) of the mine was taken through refresher training by the Ghana National Fire Service. This is part of their competency training to ensure best practices in response to fire and other emergencies.

### 5.2.5 Fire Incident Report on Bungalow 16

At about 7:52pm on Friday 24th January 2014, a fire broke out at bungalow 16 which was formerly occupied by the Deputy Managing Director. Immediately, the Ghana National Fire Service (GNFS) as well as GMC Emergency Response Team (ERT) were summoned to control the fire from escalating and spreading onto nearby premises and vegetation. The fire spread so quickly that it engulfed the whole building before the arrival of the GNFS. It was finally extinguished after battling for about five (5) hours. Close-by residences were evacuated and no fatality and injuries were recorded since the bungalow was unoccupied at the time of the incident. See plates 26 and 27 for the bungalow before and after the fire outbreak respectively.



*Plate 26: Shows Bungalow prior to fire disaster*



*Plate 27: Shows Bungalow after the disaster*

The fire was finally brought under control around 1:30am the following morning 25<sup>th</sup> January 2014 and monitored till 9:30am same day to ensure that it was completely extinguished. All electrical cables leading to the bungalow in question were re-directed by GMC electrical department and incident scene barricaded. The Chief Inspector of Mines was duly notified on 25<sup>th</sup> January 2014 by the General Mine Manager.

#### 5.2.5.1 Investigation Committee

A seven (7) member Fire Investigation Committee was constituted and given two weeks to:

- Determine the root cause of the fire outbreak;
- Recommend measures to prevent future occurrence.
- Make recommendations on emergency response protocols.

The members were:

1. Emmanuel Coffie-Anum – HSE Superintendent (Chairman)
2. Daniel Sarpong- Resident Electrical Engineer (member)
3. Nils Andersen – Electrical Consultant (member)
4. Paul Apalangya- Mine Superintendent (member)
5. Francis Adade – Warehouse Superintendent (member)
6. Richard Mensah – Safety Officer (member)
7. Oswald Sagraza- Security Co-ordinator (member)

### 5.2.5.2 Investigation procedures

The committee commenced work on the 27th January 2014. Twenty (20) witnesses including the house cook and the security guard on duty at the time of the fire were interviewed individually. Eye witnesses reports indicate that the fire started at bungalow16 around 19:43 hours. During this period, it was raining with strong windstorm (16mm rainfall and wind speed of 87-105km/sec were recorded). There was no electrical power supply to the area at the time of the fire.

An eye-witness saw lightning striking the bungalow and heard the Automatic Alarm System Siren blowing, another witness saw lightning and smoke from the building and called ERT member. Automatic Systems notified about a fire alarm. See plates 28 and 29 for fire alarm system notification and MTN call made to ERT member.

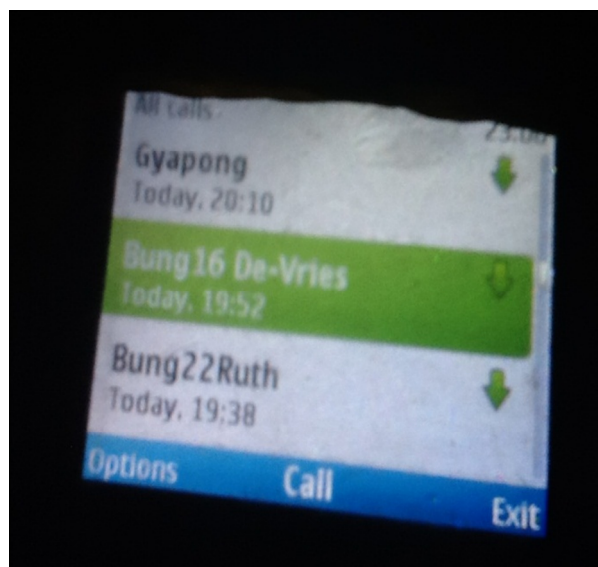


Plate 28: Shows Fire alarm System notification

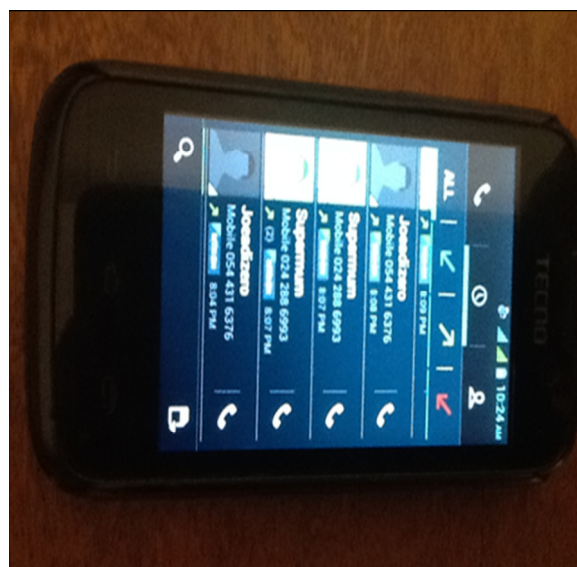


Plate 29: Shows MTN calls made to ERT member

The ERT and G4 Security Radio Controller got notified by various sources and moved to the scene with a number of portable fire extinguishers as first response since GMC fire tender was not usable. The Ghana National Fire Service (GNFS) was called immediately with backup GMC water tanker to the scene.

Before ERT moved to the scene, the Security Coordinator and G4 Security were in position ensuring traffic control and evacuation of occupants of nearby residences.

### 5.2.5.3 Field Inspection

The lightening arrester and the earth wires on the building structure were inspected. The earth wires were only burnt from outside, not from inside. The Inspector (Daniel Paddy-Nartey) from Inspectorate Division of the Mineral Commission visited the mine on the 5th February 2014 and joined the committee to the incident scene.

### 5.2.5.4 Findings and observations

- a. General
  - i. Bungalow 16 was historical building built from imported, heat treated timber on Rolled Steel joist pillars;
  - ii. The construction was covered with 2mm steel sheets, the roof and outside walls.
- b. Alarm System fitted to the house to alert ERT/Security of fire hazards and intruder presence notified the fire outbreak earlier than any other report to the ERT;
- c. Lightning arrestor fitted to the building was damaged by the fire;
- d. It was revealed that the security guard on duty at bungalow 16 was not aware of the fire out-break as he was taking refuge under the building due to the rainstorm and only responded to security control communication at the time of the fire;
- e. No traces of excessive current were found on earth-wires when it was checked;
- f. No traces of external ignition sources were found;
- g. An empty gas cylinder was found equipped with safety valve, the cylinder had shown severe burn marks but no trace of explosion/damage was seen;
- h. During the fire outbreak, GMC fire tender was not useable, hence GMC water bowser was deployed to assist the Ghana National Fire Service to extinguish the fire;
- i. No fatality/injuries were recorded;
- j. Few trees (coconut, palm, acacia etc.) serving as wind breaks were found withered;



- k. The service cables/pole and all household items were found burnt by the fire;
- l. It was found that evacuation and traffic management worked efficiently.

### 5.2.5.5 Weather Conditions

Temperatures in Nsuta were estimated at 25°C with local reports of very strong winds predominantly from the North East. The nearest automatic weather station (AWS) is located at the Repeater station and records are representative. See table 9 below.

*Table: 9: Shows Hourly observations at GMC Nsuta, 24<sup>th</sup> January 2014*

<i>Local Time</i>	<i>Temperature (°C)</i>	<i>Relative Humidity (%)</i>	<i>Wind Dir (degrees)</i>	<i>Wind Speed (km/h)</i>	<i>Rain (mm)</i>	<i>Barometer Pressure (hpa)</i>	<i>General Weather Condition</i>
19:30	25.00	98.6	285	78-100	16	1008.5	Cloudy/tender and lightning

### 5.2.5.6 Root Cause Analysis of the Fire

All evidences point to support that harsh meteorological condition (lightning induction) over bungalow 16 caused the fire. Conditions were observed locally at the time of the fire. The following evidences confirm the likelihood of the source of ignition by lightning induction:

- Eye-witnesses' statement indicate lightning and fire-alarm were observed in close timely manner. This led to the assumption that the fire started below the ceiling sheets where the smoke sensors were mounted.
- GMC lightening disaster register was checked and histories of similar occurrence were seen;
- Direct hit was not possible as earthing and lightning arrestors of the outer sheets and on top of the house showed no heat traces of excessive current as it should be in practical terms by direct lightning hit during inspection of the incident scene;
- The gas cylinder found had no signs of explosion/structural damage. It was found empty. It contained gas when the building was left unoccupied. It is assumed that the cylinder content was discharged by the fire.

#### **5.2.5.7 Financial cost of property damage**

The book value of bungalow 16 is approximately USD 39,000. The estimated market value is USD 56,000. Using the estimated market value plus the cost of items in the house leads to a total cost of property damaged as USD 83,410.13

#### **5.2.5.8 Conclusion**

The harsh meteorological conditions at the time of the fire, the available fuels (wooden structure and LPG gas), and the topography of the surrounding area, all contributed to the fire event. Generally, there are two possible hazards posed by lightning in terms of fire; these are direct lightning hit and induction. Strong induction is capable of destroying electronics in a way that serves as a source of ignition.

Upon systematic fire scene examination, the investigators eliminated the presence of external heat sources. Further verifications from witnesses interviewed and observations, the investigators identified one potential heat source (fire ignition) within the area to be lightning induction fueled by LPG gas located in the kitchen.

However, all additional findings such as glitches in procedures, communication delays, unavailability of equipment and lack of training are hereby documented to ensure better response in future occurrences.

### **5.3 Simulation Drill Report**

As part of the recommendations of the Bungalow 16 fire incident a fire simulation drill was conducted by GMC officials at the scrap yard.

A scenario was created as follows: A Security guard's house located at scrap yard containing empty cartons caught fire. A petrol tank was near to the incident scene and an employee who saw the fire escalating to the petrol tank and an adjacent laboratory got a severe burn on the right arm and fell when he attempted to initially put out the fire. The main boom to the scrap yard was locked with a padlock to serve as obstacle to the Emergency Response Team.

Emergency call out procedure was executed by Charles Sapah G4S guard force commander at 16:13hours. Emergency response team on GMC fire tender arrived at the incident scene within five (5) minutes but was a little confused since the gate to the boom was locked and the Security guard could not make the key available. Finally, the boom gate was opened for the fire tender.

The emergency response team spotted the casualty in pains and carried him to a safe location and the fire tender was operated to extinguish the fire. Response time by ERT was excellent, identification of a casualty at the scene and immediately carried from danger to safe place was good. Operating the fire tender to extinguish fire was also perfect.

It was noted that, personnel of ERT were inadequate in case of emergency and needs to be increased. G4 Security Supervisors and Crew should be sensitized to practically involve themselves in assisting ERT in emergencies; even serve as by-standers to direct unauthorized personnel and vehicles during such situations. See plates 30 and 31 below for firefighting demonstrations.



*Plate 30: Shows fire drill scenario setup at the scrap yard*      *Plate 31: Shows ERT extinguishing fire*

#### **5.4 Risk Assessment and Fire Extinguishers**

Risk registers have been developed for all departments of the mine. Monitoring matrixes will be generated out of these registers in order for risk owners to focus. This is to ensure the efficiency of the controls for the activities with high residual risk.

As part of emergency preparedness, fire extinguishers are positioned at vantage points on the mine and all the equipment have been provided with. Every employee has been taken through the procedure to extinguish fire. Fire drills are conducted periodically to build up confidence level of employees. Fire Extinguisher checks are done monthly to know their conditions for necessary actions to be taken.

Below are the number of fire extinguishers on the mine and their distributions. The total number stands at two hundred and sixty-nine (269):

- Equipment – 72
- Light vehicles – 50



- Other Locations on the Mine – 72
- Other Locations Outside the Mine – 34
- Reserves in our store room - 41

## 5.5 Ebola Awareness Campaign Workshops

Ghana Manganese Company Limited organised an Ebola awareness campaign workshop for teachers of public schools in the company's host communities at the cost of US\$156.74. The programme was a joint effort by the Health, Safety, Environment and Community (HSEC) and the Medical Departments of GMC. The lead facilitator for this programme was Mr Stephen Gyabaah, Head of Laboratory at the GMC Hospital.

On December 1, 2014, participants were taken through the tit-bits on Ebola including, symptoms of the disease, mode of spread, probable gestation period for symptoms to manifest and how to prevent or support victims of the disease. At the end of the programme, participants were advised to take the knowledge gained from the workshop to their schools and to their school communities as well. Below in plates 32 and 33 are some pictures of the programme.



*Plate 32: Participants listening to lectures on the Ebola disease*



*Plate 33: Participants discussing how to reach out to their communities*

## 5.6 Staff Development Programme

In pursuance of the commitment of management to promote knowledge, skill and talent development of its workforce, the Company recognizes the need to develop its people so that they become fully equipped with the necessary skills and technology to deliver the Company's business objectives and in support of the minerals commission's local content agenda . Ghana

Manganese Company Ltd (GMC) supported quite a number of training and development programmes in the year 2014 internally and abroad.

This commitment to training has been congruent with yearly increase in budget allocation for training activities. Under the year of review, all departments of the company benefitted from training programmes. Total amount spent on training for the year under review was US\$ 89,923.77. See table 10 below for summary.

*Table 10: Shows Summary of 2014 Training Activities*

S/N	Type of training	Purpose of the training	Who conducted the training?	List of Beneficiaries	Participation fee
1	A professional career development sponsored package for 2-year degree programme in mechanical engineering- Jan 2014	In connection GMC's localization plan as presented to the Minerals' Commission of Ghana	KNUST, Kumasi	Emmanuel Cobbinah	GHC 1,400.00
2	A professional career development sponsored programme- Jan 2014	Payment of a surveyor certification fee	Ghana Institute of Surveyors	Isaac Ekow Anaman	GHC 1,440.00
3	IT professional career development programme (MCTIP)- Feb 2014	Undertake a Microsoft professional certificated course	GIMPA, Legon	Bernard Kwame Kramo	GHC 6, 560.00
4	A technician certificate in mechanical engineering- Feb 2014	In line with HR succession planning designs.	Covenant Institute of Professional Studies, Tarkwa	Emmanuel Nketsia	GB£ 395.00 GHC1,995.18
5	Evaluation measurements of uncertainty for	To improve lab workers' knowledge on	Precision Professional Events	<ul style="list-style-type: none"> <li>Abubakar Seidu</li> <li>Bright Asare</li> </ul>	US\$ 2, 385.00

	chemical testing laboratories- Feb 2014	use of statistical methods in evaluation efficiency and effectiveness of lab results.	Company, South Africa	Sarpong • Emmanuel Otoo	GHC6,391.80
6	Professional career development in Electronic & Electrical Engineering – Feb 2014	In line with HR succession planning designs.	KNUST, Kumasi	Stephen Armah	GHC 4,626.00
7	Commonwealth Executive MBA – Feb 2014	In line with HR succession planning designs.	KNUST, Kumasi	Solomon Kwame Dankwa	GHC 8,000.00
8	Fire prevention & fighting training- March 2014	To prepare security and safety personnel with the necessary skills to prevent or fight fire whenever it occurs.	Ghana Fire Service	61 people were trained comprising 41 security personnel and 20 departmental safety reps	GHC 3, 050.00

S/N	Type of training	Purpose of the training	Who conducted the training?	List of Beneficiaries	Participation fee
9	Continuous professional development programme refresher training- Sept. 2014	Professional certification course	Ghana Institute of Surveyors	Isaac Ekow Anaman	GHC 350.00
10	NEBOSH International general certification in occupational Safety & Health Training	Professional career development programme	NEBOSH, U.K.	Richard Mensah	GHC 4,200.00

	Programme- March 2014				
11	NEBOSH International general certification in occupational Safety & Health Training Programme- June 2014	Professional career development programme	NEBOSH, U.K.	George Bentum  Joseph Adizero	GHC 4,200.00  GHC 4,200.00
12	Mobile Crane & Forklift Operating training programme- June 2014	Continuous professional development and certification of lifting equipment operators.	CIT- Africa	12 workers from the Light Vehicle department	GHC 12, 651.19
13	GEO User Conference- July 2014	Improve knowledge skills in the use of the GEO software by surveyors	Ghana Institute of Surveyors	Isaac Ekow Anaman	GHC 300.00
14	Annual Land Surveyors and Continuous Professional Development Seminar-July 2014	Continuous professional development programme	Ghana Institute of Surveyors	Isaac Ekow Anaman	GHC 400.00
15	Conference for Ghana Physician Assistants- Anaesthesia- Aug 2014	Continuous professional development programme	Ghana Health Service	Dr. Agodzo Mr. Barnes Ayisi	GHC 1,000.00
16	Practical Geostatistics and mineral resource estimation master class training- March 2014	Update knowledge and skill in geostatistics and mineral resource estimation as part of a continuous professional development	Neoedge Consultancy	Francis Fosu Nana Owusu Oppong	US\$ 9,990.00 GHC26,773.20

17	2014 Paediatric conference	Continuous professional development programme	Ghana Health Service	Dr. Agodzo Mr. Kpolley Yankey	GHC 500.00
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S/N	Type of training	Purpose of the training	Who conducted the training?	List of Beneficiaries	Participation fee
18	Continuous professional development programme - August. 2014	Continuous professional development programme	Ghana Employers Association	Yvette Adjei Benn Ramatu Ali Toure	GHC 1,150.00
19	Continuous professional development programme September 2014	Professional career development programme	Laysia Consult	Sixteen Employees from various departments	GHC8,812.50
20	Continuous professional development programme September 2014	Professional career development programme	GIMPA	Six Employees from various departments	GHC 4,800
21	Continuous professional development programme November 2014	Continuous professional development in HR Data Management	Web and software Consult	Mr. Wisdom Adjei Mensah	GHC2,500
22	Continuous professional development programme March 2014	Continuous professional development programme on Executive and leadership skills	Uhuru Institute of Management Training in South Africa	Mr. J. Ampong	GHC16,279.20