



# **ON GUARD: AN AID TO OCCUPATIONAL SAFETY AND HEALTH**

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| History of Occupational Safety & Health in Zimbabwe.

| Fundamentals of Steam Boilers: A Safety Perspective.

| Reflecting on the World Day for Safety and Health in Zimbabwe 2023.

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## EDITORIAL

The 10<sup>th</sup> International Labour Conference (ILC) recently made a landmark decision that committed ILO member states to respect and promote the fundamental right to a safe and healthy work environment irrespective of whether any OSH conventions have been ratified. This far-reaching milestone was adopted through a resolution on 10 June 2022.

Invariably four categories of fundamental principles and rights at work have been in existence since 1998 namely:-

- ✓ Freedom of association and the effective recognition of the right to collective bargaining.
- ✓ Elimination of all forms of forced or compulsory labour.
- ✓ The effective abolition of child labour.
- ✓ The elimination of discrimination in respect of employment and occupation.

Associated with this new OSH fundamental principle and right at work is the Occupational Safety and Health Convention No. 155 of 1981 which Zimbabwe has since ratified on 9 April 2003 and the Promotional Framework for Occupational Safety and Health Convention No. 187 of 2006. It is also important to note that Zimbabwe has also ratified the following Conventions:-

- ✓ Convention 161 on Occupational Health Services, 1985, ratified on 9 April 2003.
- ✓ Convention 162 on safety in the use of asbestos, 1990, ratified on 9 April 2003.
- ✓ Convention 170 on safety and health in the use of chemicals ratified on 27 August 1998.
- ✓ Convention 174 on Prevention of Major Industrial Accidents ratified on 9 April, 2003.
- ✓ Convention 176 on Safety and Health in mines ratified on 9 April, 2003.

The inclusion of OSH as a fundamental principle and right at work would entail that all ILO member states have an obligation to respect and promote widely safe and healthy working conditions in the same manner and with some level of commitment as with the four principles highlighted above.

OSH now being a fundamental principle means that the principles and rights are fully expressed and developed in the form of specific rights and obligations in various OSH Conventions. Hence Convention No. 155 on OSH and Convention 187 on OSH Promotional Framework have now been elevated to being fundamental conventions alongside the previously 8 ILO fundamental conventions namely:-

1. Freedom of association and protection of the rights to organise convention, 1948 (No. 87)
2. Right to organize and collective bargaining convention, 1949, (No. 98).
3. Forced labour convention, 1930 (No. 29) and its 2014 protocol.
4. Abolition of forced labour convention, 1957 (No. 105).
5. Minimum age convention, 1973 (No. 138).
6. Worst forms of child labour convention, 1999 (No. 182)
7. Equal remuneration convention, 1951 (No. 100).
8. Discrimination (Employment and Occupation) convention, 1958 (No. 111).

These 8 conventions, Zimbabwe has since also ratified.

Fundamental principles and rights at work provides a basis upon which equitable and just societies are build. They offer a solid foundation for social dialogue, better working conditions for workers, increased productivity, better jobs, social protection and above all decent work environments. Hence OSH now being part of the fundamental principles and rights at work would require all social partners to play their roles effectively to promote the establishment of safe and healthy work environments for the good of all workers in all sectors of the economy.

# **THE HISTORY OF OCCUPATIONAL SAFETY AND HEALTH IN ZIMBABWE**

By

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The earliest documented evidence of OSH development in Zimbabwe started during the colonial/ Southern Rhodesia era when the country became a British colony in 1890. Because this period coincided with the second industrial revolution in Britain, it also influenced the processes and organization of production systems of Southern Rhodesia. It brought about a shift from the pre-colonial simple but labor-intensive methods of production that were organized around individual families to more exploitative and mechanized methods of production that were organized into larger units in mining, agriculture and manufacturing. Consequently, these changes also brought about significant safety and health issues in the labour-force which then prompted the development of OSH in Zimbabwe.

## **The development of OSH regulation in Zimbabwe**

OSH regulation in Zimbabwe started in the early part of the 20<sup>th</sup> century with the introduction of health regulations mainly in the mines and factories. In 1908 the Rhodesian Government Notice 23 was gazetted to provide for the nutritional requirements of mine workers (Stoke. J,1977). However, these were more of health regulations which focused solely on nutrition and overlooked other safety and health issues that affected workers in mines. This was followed by the promulgation of the Workman's Compensation Act of 1922 which made provisions for compensation of workers in the event of a work related accident or disease. However, this Act did not make provisions for the protection of workers' safety and health and was later repealed by the National Social Security Act (Accident Prevention and Workers' Compensation Scheme) S.I 68 of 1990. This statutory instrument not only makes provisions for workers' compensation but also outlines the duties of employers and employees in promoting safety and health.

The first notable law to make provisions for the protection of workers' safety and health was the Mines and Minerals Act of 1935. The Act still remains in force to date although it has been amended several times over the years. This was followed by the Factories and Works Act of 1948 which made provisions for the protection of workers' safety and health in factories. Again this Act has been amended severally over the years but the most significant one was in 1976 which led to the introduction of 8 issue specific regulations to provide guidance to employers (On Guard, 1976). The Act was later revised in 1996 and remains in force to date.

In 1949 the Silicosis Act was enacted which was prompted by the increasing number of silicosis cases among mine workers in Southern Rhodesia. This Act provided for the diagnosis of silicosis and compensation of affected workers. This Act was then repealed by the Pneumoconiosis Act of 1971 and its subsequent revision in 1996 to include other types of pneumoconiosis such as asbestosis and others (Moyo et al, 2015). The law is currently in force to date.

Other laws were enacted in post-colonial/ Zimbabwean era. These include the Labour Relations (HIV and AIDS) regulations SI 202 of 1998 and its subsequent amendment SI 105 of 2014 which made provisions for HIV prevention strategies and prohibition of mandatory testing, stigma and discrimination in workplaces. Another statutory instrument was the Collective Bargaining Agreement: Agricultural Industry (Occupational Safety, Health and Environment Code) SI 197 of 2021 which was the first ever regulation which provided for the protection of safety and health of workers in agricultural establishments. Furthermore, Zimbabwe has ratified the following ILO Conventions: Chemicals 170 of 1990 in 1998, Occupational Safety and Health Convention 155 of 1981, Occupational Health Services Convention 161 of 1985 and Prevention of Major Industrial Accidents Convention 174 of 1993 and Safety and Health in Mines Convention 176 of 1995 in 2003. (ILO; 2006- 2017).

However, despite these developments there are challenges with the current regulatory framework as it is still fragmented, sector specific and has marginalized other sectors such as domestic workers and the informal sector.

### **Major Milestones**

Major milestones in OSH development in the then Southern Rhodesia can be attributed to Travis. C. J. Hunt who is considered as the, “father of occupational safety in Rhodesia” (On Guard, 1978, p. 2). He worked as the Workmen’s Compensation Commissioner and later Director of Occupational Safety and Compensation from 1964 to 1978 when he retired. During his tenure the following major milestones were achieved:

#### **Establishment of two workmen’s rehabilitation centres**

Two rehabilitation centres were established, St Giles Rehabilitation Centre in 1964 for white workers and the Workmen’s Compensation and Rehabilitation Centre (WCRC) in 1971 for African workers. Both centres are still operational to date.

#### **Formation of the Rhodesian Occupational Safety Council (ROSC) in 1968**

This was a body of employer and employee representatives drawn from a wide spectrum of industry which was formed to drive the national safety effort through the Director of Occupational Safety and Compensation (On Guard, 1975). Its formation significantly changed the landscape of the national safety strategy from being driven

solely by government through a system of laws and enforcement to a tripartite approach involving active consultation and participation of employers and employees. Post-colonial era the council was renamed the Zimbabwe Occupational Safety Council (ZOSC) and later the Zimbabwe Occupational Safety and Health Council (ZOSHC). The council is still active to date.

Through the combined efforts of ROSC and the Directorate of Occupational Safety and Compensation several safety promotional tools and initiatives were introduced which include: launch of safety and health publication- the On Guard Magazine in 1968 (On Guard, 1992), introduction of the ROSC system in 1972 (this was the most significant initiative as it shifted safety efforts from the traditional approach of merely trying to prevent accidents to a more systematic approach that used management techniques in protecting the safety of people, equipment, materials and the environment) (Post and Telecommunication Corporation, 1975), release of the first safety promotional postage stamps in 1975 (Post and Telecommunication Corporation, 1975), release of a safety film entitled, "The Way Back," in 1976 to promote uptake of rehabilitation facilities among Africans and the introduction of the Safety Advisor's Training Course (SATCOR) which was the first professional course tailor-made for Southern Rhodesia's industry (On Guard, 1976). The course was later renamed to the Occupational Safety, Health and Environmental Management Course (OSHEMAC) in the post-colonial/ Zimbabwean era and is still currently being offered to industry.

#### **Creation of the Safety Promotion sub- branch under the Directorate of Occupational Safety and Compensation in 1974**

Previously the department had been made up of Factories inspectors only who used the "inspect and enforce compliance" approach which forced industry to simply comply for fear of penalties. However, the introduction of safety promotion officers led to the "promote and support compliance" approach where industry was advised and guided through trainings and awareness programmes. This promoted voluntary compliance to safety and health laws. The branch was later renamed the Occupational Safety and Health Promotion department and is still active under the OSH Division of the National Social Security Authority which is the OSH regulatory body in Zimbabwe

#### **Introduction of the first Zimbabwe National Occupational Safety and Health Policy in 2014**

This policy was formulated by the Zimbabwe Occupational Safety and Health Council in an effort to address the inadequacies in the country's OSH regulatory framework which as highlighted earlier still marginalizes certain economic sectors. The policy provides the framework for harmonization of our laws into one Act and ensure coverage of every economic sector towards the creation of decent work for all. While

this policy was revised in 2021 the country's OSH regulatory framework still remains fragmented, sector specific and marginalize certain sectors of the economy.

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# THE LAW AS AN OBJECT IN THE DISCOURSE OF CCUPATIONAL ACCIDENT PREVENTION: A LEGISLATIVE APPROACH

By

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## Definition of key terms

**Accident** - Any undesired, unplanned event arising out of employment which results in physical injury or damage to property, or the possibility of such injury or damage.

**Employee:** any person who performs work or services for another person for remuneration or reward on terms and conditions as agreed upon by the parties or as provided for in Labour Act Chapter 28: 01, and includes a person—

- (a) Who supplies his own tools or works under flexible conditions of service, or
- (b) in any other circumstances that resemble the relationship between an employee and employer.

**Employer:** any person who employs or provides work for another person and remunerates or expressly or tacitly undertakes to remunerate him/her, and includes—

- (a) the manager, agent or representative of such person who is in charge or control of the work upon which such other person is employed; and
- (b) the judicial manager of such person appointed in terms of the Companies Act [Chapter 24:03];
- (c) the liquidator or trustee of the insolvent estate

## **1.0 Introduction**

In organizations, legislation, codes of conduct and other measures have been put in place to fulfil the desire to limit or exclude accidents in their activities. The Fundamental Principles and Rights at Work were adopted in 1998 and amended in 2022, as part of the International Labour Organisation Declaration on Fundamental Principles and Rights at Work. It heralded an expression of commitment by governments, employers and workers organisations to uphold basic human values – values that are vital to our social and economic lives. Likewise, the Constitution of Zimbabwe enshrines detailed provisions for the rights of citizens derived from the international obligations. The discussion around the effectiveness of law in occupational accident prevention has been prevalent recently.

The breach usually consists of unsafe acts and/or conditions, but it can also consist of an omission when there is some duty to act. This paper will address both the personal responsibilities and liabilities of safety and health practitioners; and the duties and tasks necessary to limit employer liability.

## **2.0 Workers' fundamental rights**

Workers' rights at national level are laid out in a number of pieces of legislation including the Constitution of Zimbabwe and the Labour Act Chapter 28:01 which provide for:

- refuse performing forced labour
- not to be discriminated against
- to fair labour standards –right amounts of wages, must work under conditions specified by law or the conventional practice of the job for protection of their health or safety.
- to democracy in the work place i.e. form and belong to workers' committees to address workers grievances e.g. OSH committees
- Right to stop work without notice or other formalities if faced with immediate occupational hazard

- Collective bargaining that include requirements for occupational safety and health
- Right to go on sick-leave, maternity etc.
- Under 18 not to perform work that jeopardises their health, safety, morals (Employment of Children & Young Persons) regulations 172 of 1997

### **3.0 Importance of laws**

Laws are a fundamental necessity in society because:

- They set standards & procedures to be followed by individuals & organisations
- Enable enforcement of policies, OSH & environmental management systems
- They enable litigation
- They enable the realisation of societal aspirations

### **4.0 Structure (Hierarchy) of laws and regulations**

#### **International level**

- Conventions & Treaties
- Protocols

#### **National level**

- Constitution
- Acts/Regulations/By-laws
- Codes of practice/Guides/Orders

### **5.0 What is law?**

**LAW** - “rules of behaviour to which society attaches some sort of sanction through the courts”. Laws impose obligations which if not met may trigger some sort of sanctions/punishment. OSH law is concerned with both criminal and civil liabilities of employers towards their employees and other persons that may be affected by their activities e.g. employees of contractors, visitors & members of the public

## 6.0 Types of laws

**Legislation (Statute law)**, is a specifically enunciated rule that is either

- (1) directly enacted by parliament (Acts of Parliament) or
- (2) formulated in accordance with the principles for *delegated legislation* – drafted by public servants and formally approved by the executive authority – Minister (Zimbabwe).

Statutes and regulations generally give rise to criminal liability. Employers who breach legislation may be subject to prosecution by the enforcement authorities, such as NSSA or the Local Authority in the criminal courts. If found guilty of the charges levied, can be fined or imprisoned, or both. An Act may have provision for **Codes of practice**. Though the Code of practice are generally not legally binding they may be used as evidence of compliance or non-compliance with the main formal legislation. Code compliance may strongly indicate that what was *reasonably practicable* was done. Delegated legislation normally takes the form of regulations/Statutory Instruments/By-laws/Notices.

**Common law** is unwritten law not specified in statutes or regulations and usually originates from:

- a) Court decisions, some made long back in history bound by the doctrine of precedent

It's essentially law made by judges and develops gradually as courts respond to societal change – so called landmark rulings. Lower courts are obliged to follow previous decisions of courts higher in the hierarchy. It is the Supreme Court or particularly the constitutional court that in unusual cases may depart from its previous decisions and its decisions are binding on other courts.

b) What society regards as good and/or bad - norms, values, beliefs (Informal Law)

They form important mechanisms for guiding and controlling human behaviour such as management of SHE issues whereas social and personal norms are decentralised, emerging at local levels, and are “enforced” internally without the interference of a third party

## 7.0 Criminal vs Civil law

### Criminal law

Criminal deals with those rules that society has interest in enforcing i.e. where contravention behaviour is regarded as a **threat to society** in general. Are enforced at the instigation of public officials such as public prosecutors. In SHE law cases, by the regulator or inspector.

Penalty is by imprisonment, community service or fine paid to the state. Criminal law addresses safety and health more directly by seeking to prevent accidents by penalising the creation of risks to safety and health.

### Civil law

Civil obligations are those owed by citizens to each other e.g. issues to do with damages, breach of contract or workers’ compensation. These are initiated by individuals/organisations that have been harmed. Damages or compensation payment is made to harmed individual/organisation.

Civil law indirectly improves safety in the workplace through:

- a) the obligations it imposes on employers and others to take **reasonable care** for the safety of workers,
- b) through the impact of damages awarded

In SHE law, certain injuries, damages or risks may lead to both *criminal* and *civil* suits.

**Civil** – workplace injury can lead to a civil action by employee for compensation for damage caused leading to award of money or other benefits to injured worker/family

**Criminal** – criminal prosecution conducted by an inspector (or the regulator itself) and a penalty imposed on the responsible party.

## 8.0 Application of law

### a) Vicarious Liability

Employer is indirectly responsible for the actions of his employees (*as the master is responsible for actions of his servants*). Based on that he/she is the employer & therefore is deemed to have total and ultimate control over the actions of his employees. Required is the establishment of systems, appointment of key personnel, training and awareness, maintenance of machinery etc. as a remedy.

### b) Duty of care principle

It's a legal duty to take care for the safety, health and security of another person. Employees to take reasonable care to avoid acts or omissions which you can reasonably foresee would likely injure another person/ your neighbour. Those in charge of workplaces have a duty to look out for the safety of other workplace participants/workers. It's a civil duty to care for others as well as a criminal offence under OSH laws. All players at the workplace should adhere to set rules or standards, training etc.

## 9.0 Conclusion

Law plays an important role in protecting the safety and health of employees and other stakeholders at various workplaces. Adequate management control should be achieved by putting into practice the required actions as stipulated in the legislation and in any risk assessments undertaken. Attitudes and behaviour in the workplace of

both management and workforce can be positively enhanced by the application of the law. Accidents cost money and lives, do not learn safety by accident. Take action and monitor.

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Government of Zimbabwe. Labour Act Chapter 28:01 (updated to 2019)

Government of Zimbabwe. Criminal law (Codification and reform) Act Chapter 9: 23

# FUNDAMENTALS OF STEAM BOILERS: A SAFETY PERSPECTIVE

By

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## Preamble

Boiler use started around the early stages of the first industrial revolution when steam engines were designed for use in various technologies of that time. Denis Papin, a French man is credited with having designed the first boiler in 1679<sup>1</sup>. Years later, Americans George Babcock and Stephen Wilcox made the first patented boilers<sup>8</sup>. As would be expected, these early designs carried little to no safety fittings at all and would go on to cause a series of serious fatal accidents. History has records of serious boiler accidents that killed thousands of people every year during these formative years. These failures prompted the incorporation of different standards, codes, laws and safety fittings on subsequent boiler designs.

Governments across Europe, America and Asia were then in the 1800's motivated to start producing legislation that governed boiler design, manufacture and operation to curb the scourge. The result was a far improved steam plant environment that resulted in reduced accident frequencies. Boilers manufactured nowadays are far safer provided they are used with due care.

## Boiler defined

Zimbabwean law defines a boiler as any enclosed vessel in which a fluid is heated to continuously produce steam or vapor/gas at pressures above atmospheric pressure<sup>2</sup>. A slight variation in the definition allows for gauge pressures that are slightly higher than the limit given above but the variance must never exceed this limit by more than 50 kilopascals.





#### Clockwise

- Makeshift empty oil drum boiler [*obviously an illegal and unsafe boiler*]
- Conventional fire tube boiler
- Locomotive boilers [now being phased out due to age issues]

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## Background

There is widespread use of different *steam boiler* [hereafter referred to as just *boilers*] designs in most manufacturing and process industries in Zimbabwe. These boilers are generally classified as low, medium or high-pressure type. We have a different classification system that groups boilers into Class I, Class II and Class III in decreasing order of pressure range or size of vessel respectively<sup>4</sup>. The figures used to define these different classes will not be given here but interested readers can refer to the different standards, codes and legislation governing boiler use in the country.

Regardless of the class of boiler one is using, the potential for serious accidents exists across the whole class spectrum and there is absolutely no room for complacency when using any boiler. The combination of high temperature and pressure conditions required to generate steam makes all boilers potentially dangerous. Several boiler failures and explosions have resulted in fatalities, serious injury and infrastructure damage over the years in this country.

To reduce the accident risks, every boiler design, manufacture, installation, or operation should be according to approved and acceptable written laws, standards, specifications and codes.

*This article explores the most common non-conformities that can cause boiler failure as well as how they can be minimized. Unsafe conditions in boiler operation are usually preceded by system or mechanical failures, some of which I will attempt to cover in the article. Brief references to the general Zimbabwean statutory requirements on boiler erection and use will be made.*

### **Basic boiler use safety summary**

Every premise on which a boiler is installed and used should have a person/s with technical competency to run and maintain the boiler. Relevant technical training at apprenticeship, diploma or degree level, coupled with relevant experience, is a pre-requisite for an individual to take charge of boilers. Legal requirements in Zimbabwe make it mandatory for all boilers in use to be registered through the relevant Regulatory Authorities<sup>2,3</sup>. They also stipulate all the person responsibilities, standards use, required boiler safety fittings and the inspections/tests that are mandatory in boiler manufacture, erection or use.

As part of the basic general safety steps to be followed, every boiler user shall:

- ✓ Ensure the boiler has been manufactured according to an acceptable Standard or Specification approved in Zimbabwe [refer to the documents sited above]<sup>2</sup>
- ✓ Ensure that the boiler is registered by the relevant Regulating Authority<sup>2</sup>
- ✓ Appoint a responsible person who will have oversight over the safe maintenance and use of the boiler. The responsible person should have full control of the boiler and **must be given the powers to stop its use** when any unsafe condition develops during use
- ✓ Monitor the condition of the boiler on a continuous basis and notify the Regulatory Authority of any serious condition that could make the boiler unsafe
- ✓ Ensure that any pressure part repairs on the boiler are approved by a competent technical Inspector employed by the Regulatory Authority<sup>7</sup>
- ✓ Ensure that all pressure part repairs, and subsequent integrity tests on the boiler are only done by approved service providers [approval done by Regulatory Authority] and that all pressure part repair materials used have documented certificates of fitness for purpose<sup>2</sup>
- ✓ Prepare the boiler for periodic inspections and tests at frequencies stipulated by the Regulatory Authority/Chief Inspector

*We now shift focus onto the major day to day safety challenges and typical boiler failures that could compromise general safety. Basic mitigatory action that engineers, and support staff need to apply to eliminate or reduce safety hazards/risks during use will covered.*

## 1. Low-low boiler water risk

The **low-low water** condition in a **fired** boiler is one of the most common hazard/risk that exists in boiler operation. As steam is drawn from the boiler and sent into the process plant, the water level in the boiler will obviously fall and needs to be replenished. If the drop in water level falls beyond the allowable safe limit and is not restored to normal levels on time, the already hot metal heat exchange surfaces will start to overheat. The overheated pressure parts will start to weaken and might eventually fail, causing furnace/boiler tube collapse, bulging, blistering or even explosions. These preceding failure modes all have a potential for causing serious accidents.

We need to understand that despite the boiling water circulating in the boiler being very hot, it acts as a cooling medium to the metal surfaces that would be at comparatively far hotter temperatures. Significant water/steam losses from the boiler system water side thus seriously reduces the capacity to adequately keep the metal surfaces temperatures in check. Failure will invariably follow if serious emergency steps are not taken on time. Automatic replenishment of the losses is usually incorporated on most boilers, but these control systems sometimes fail, causing accidents.

Where the water/steam losses are permanent, say for example through pipework leaks, gasket leaks, valve leaks, excessive boiler blowdowns, process losses, or any other permanent losses for that matter, make-up water will now have to be added to the circuit. Unfortunately, make-up water will normally be fresh untreated water from municipal supplies, boreholes, etc. This untreated water is always a serious 'enemy' to the boiler/plant as it tends to introduce further boiler water quality challenges.

You will agree that the water that circulates between the plant and the boiler gets gradually cleaner through blowdowns and deliberate chemical treatment. Any system losses of this cleaned water will result in re-contamination challenges as make-up water is added to the system. Chances of scale build-up, water foaming/priming and metal corrosion will thus increase with associated risks of metal cracking, blistering, bulge/ collapse, tube sagging/hogging, water level control systems failure or even boiler explosion. If your plant has serious and uncontrolled steam/water leaks for prolonged periods of time, anticipate possible catastrophic failures at some point during your operations.



To reduce the chances of serious water level-related accidents, the handlers of the boiler shall avoid:

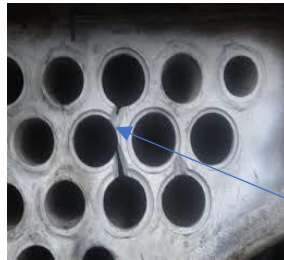
- ✓ Excessive rates of steam withdrawal from the boiler
- ✓ Dirty gauge glasses to allow easy, accurate visual checks of water level. Conduct blowdowns every shift
- ✓ Failure of water feed pump/s [test these periodically for pump efficiency with the boiler running at normal working pressure]
- ✓ Under-sized boiler water feed pumps [minimum two functional pumps always required]<sup>7</sup>
- ✓ By-passing water level control loop
- ✓ Water level controls failure, for example, due to stuck water/steam chamber float; test these controls every shift through blowdowns
- ✓ Leaving feed line modulating valve control by-pass activated as this could starve the boiler of water
- ✓ Poor water treatment that could cause scale/rust products that may clog water level control cocks/valves, disabling them in the process
- ✓ Water feedline non-return valve failure since this will allow boiling boiler water in boiler to flow back to the feed pumps causing serious pump failure [**quick test by attempting to touch feedline with bare hand; if too hot to touch, valve is faulty**]
- ✓ Unsafe water level control settings
- ✓ Allowing automatic restart of boiler following a low-low water level boiler cut-out before ascertaining cause and rectification
- ✓ Faulty electrical water level control circuits
- ✓ Sudden addition of cold water into overheated or hot boilers
- ✓ Always remove blowdown keys once the valve has been closed to ensure accidental boiler drainage. Key should not be removable when valve is open
- ✓ Leaving boiler unattended as operator has responsibility to physically monitor water level via the visual water level indicators

The engineer or person in charge of a boiler must ensure that his operator/s knows all the emergency steps required to handle an emergency low-low water condition on a fired boiler in order to avoid catastrophic failure. The annual Boiler Operators' Course conducted by Factory Inspectors adequately covers these emergency procedure requirements.



### Clockwise

- Collapsed furnace due to a low-low water condition
- Water level lines clogged by scale and rust products
- Double ligament crack on tube sheet [usually requires total tube plate replacement]
- Level control water/steam chamber showing float



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Double tube sheet ligament crack that usually requires full tube sheet replacement

## 2. Poor water treatment risk

Poor boiler water treatment is responsible for most of the failures that occur during boiler use. The main failure mechanisms revolve around the following:

### a. **Corrosion**

Corrosion is mainly due to the presence of oxygen in the boiler water though it can also be as a result of other dissolved gas contaminants like carbon dioxide. There should always be very low levels of these harmful gases in the boiler water as they can cause acidic conditions. Results of corrosion include metal pitting, wastage, cracking and generally weakening of the affected boiler part/s. Steam/water leaks can occur in cases of metal perforation and these can cause serious accidents or even boiler explosions.

The solid corrosion products formed can flow with condensate return to reach the boiler where they may form scale deposits and cause water level controls system blockages in the water cocks. Water and steam cock blockages may in turn disable the automatic water feed pump activation system, causing water starvation of the boiler and thus serious failure or even explosion.



### Pitting by Oxygen Corrosion



#### b. Total dissolved solids [TDS] levels

This is a measure of the inorganic chemical elements that are dissolved in the boiler water. The levels of dissolved solids must never be too high in order to reduce chances of foaming and thus priming. Priming results in wet steam leaving the boiler instead of dry saturated steam. Wet steam will cause corrosion challenges in the steam reticulation lines and usually causes water hammer that results in serious explosive vibrations that can rip steam pipe work from fixtures.

The high TDS levels also increase the rate of metal corrosion within the boiler since it raises the water's conductivity properties. Scale formation rates on metal heat exchange surfaces also rise with rising TDS levels which will in turn, cause serious metal overheating problems.

#### c. Water hardness and scaling

Scale formation normally arises from certain dissolved inorganic ions carried by the water that cause water hardness. Calcium, magnesium and silica ions are usually the main hardness culprits found in boiler water. Carbonate, bicarbonate and hydroxyl ion presence can also cause scaling. Water hardness must thus be kept as low as possible if scale formation is to be minimised. Scaling on a lesser scale, can sometimes be due to high **suspended** solids [organic or inorganic] in the water or from products of corrosion that might be present in the water.



Severe scale deposits

High scale levels cause serious boiler metal overheating and higher fuel consumption through reduced heat exchange levels between the metal surfaces and the water. The usual results of overheating include metal cracking, blistering, tube sagging/hogging, pressure part bulge/collapse, metal wastage, and even boiler explosions.

**d. High pH and alkalinity**

Alkalinity and pH levels of boiler water are closely related and need to be controlled effectively. Low pH causes water acidity which corrodes metal surfaces resulting in wastage and pitting. Normally, ideal boiler water pH should be between 9 and 11.5. As the pH of the water rises, the water progressively becomes more alkaline. Too high pH and thus alkalinity levels tend to cause water foaming and priming as the water boils inside the boiler, resulting in the challenges noted under section (b) above. This also promotes higher rates of deleterious scale formation once pH goes higher than 11.5.

**e. Conductivity**

This is one other parameter that requires strict control in order to reduce the risk of boiler failure. High conductivity increases the potential for high corrosion rates as corrosion has some electrical nature. When one looks at this, the effects of conductivity are closely related to TDS effects discussed above as both are linked to the level of dissolved inorganic contaminants in the water.

There are other less critical water quality parameters that require control in boiler water, but the ones above are the major worry. One of the **most critical competency indicators for the engineer and his boiler operators is the ability to interpret water quality parameters produced during water tests as well know the negative implications that each out of norm parameter carries.** It is never enough for these personnel to merely carry out the test expert's recommended control actions to the book, without knowing the challenges that could arise on the boiler from each one of

the bad test results. Of note, it is important to be able to anticipate the effects of each control action taken since each one of these usually has a bearing on the all the other water parameters. As an example, chemical treatment done can raise TDS levels in the boiler water meaning further action has to be taken to adjust the TDS changes.

To keep water quality challenges in check, the engineer/s and operators shall:

- ✓ Ensure all water treatment requirements are prioritised and strictly followed
- ✓ Interpret water tests readings correctly as well as understand effects of each out of norm test parameter
- ✓ Avoid use of borehole/well/dam water whenever practicable. Where use cannot be avoided, water softeners, demineralisers or de-alkalizing plants usually become necessary
- ✓ Engage external water treatment service providers to keep water quality in check whilst also conducting internal tests if laboratory facilities are available
- ✓ Effectively train internal water test personnel if available
- ✓ Ensure adequate boiler blowdowns are conducted
- ✓ Ensure strict condition monitoring of boiler to prevent failure surprises
- ✓ Prevent leakages or contamination of boiler water with process products, for example oil, creosote, sucrose, etc
- ✓ Install deaerators where boiler pressures are high

### 3. **Over-pressure risk**

This one of the most serious catastrophic failure risks during boiler operation. Ordinarily, boiler over-pressure is prevented by use of safety or relief valves that must always be fitted at the top of the steam space. These valves must open automatically, as pressure inside the boiler increases, at a pre-set pressure value that must be lower than or at maximum, the **design pressure** of the vessel. Once open, the valve/s allow excess steam to escape from the boiler into the environment and should under no circumstance, permit pressure in the boiler to continue rising to levels above ten percent of the boiler design pressure.

It is important to note here that over-pressure conditions can at times occur when the boiler pressure rise is still within acceptable ranges. Metal wear, corrosion, erosion, overheating, weld or parent metal cracks, blockages, poor workmanship, creep, metal fatigue and patent metal defects can weaken a boiler, causing it to fail even without exceeding safe allowable pressure levels. The vessel's capacity to contain pressure gets negatively affected by these undesirable conditions with increased potential for surprise failures.



Accidental mixing of hot water/steam and hot flue gases via leaks can equally cause sudden over-pressure conditions that could cause serious explosions.



Locomotive boiler explosion

The risk of accidental over-pressure can be minimised by the following:

- ✓ Correct sizing of safety/relief valves<sup>7</sup>
- ✓ Never by-passing safety fittings/controls or permanently gagging passing safety valves
- ✓ Periodic functional tests of safety valves by lifting levers manually or via PLC control
- ✓ Periodic tests of pressure switches if any
- ✓ Preventing accidental leakage of hot water/steam or flue gases in a way that could mix these explosive fireside and waterside products
- ✓ Ensuring safe safety/relief valve settings that do not exceed design pressure and **keep safety valves locked to avoid unauthorised adjustments**
- ✓ Periodic inspection of boiler pressure part components for weakness causing defects, eg. erosion, corrosion, cracking, etc. Open boiler logbooks and keep all pertinent operation and failure history records in these books
- ✓ Avoid excessive cyclic loading like too frequent boiler start/stops followed by complete boiler cooling. This prevents fatigue failure/cracking of pressure parts
- ✓ Not overfiring boiler with regards to steam demand or other reasons
- ✓ Safe boiler operation to eliminate chances of different fluid flow path blockages
- ✓ Adequate boiler operator training
- ✓ Discarding or derating defective and very old boilers [conduct remnant life tests where necessary]

#### 4. Overheating risk

Overheating creates various safety and failure risks on boilers. All metals of construction used on boilers have maximum temperature limits beyond which they will yield, causing failure or even melting. Extreme temperatures seriously reduce metals capacity to withstand thermal and mechanical stress and as a result, promote failure.

Overheating of the boiler components can cause cracking, blistering, sagging/hogging, bulges or even melting and permanent plastic flow even when this is then followed by subsequent cooling. Temperatures too close to a metal's melting point can cause the metal components to flow like molten metal with possible instantaneous explosion under pressure. At times, the components experience gradual but permanent disintegration which presents as layered flaky deposits that fall off from the parent metal, causing erosion and thinning of the affected components.



Overheating effects

Poor quality fuels, especially solid fuel like coal, bagasse or wood can compound these challenges since they can cause serious erosion, slagging, fouling and passage-ways blockages. Coal with high ash content is highly erosive to metal surfaces and can cause severe soot scale deposits. In firetube boilers, this can block tubes causing boiler steam generating maximum capacity rating [MCR] to fall to unsustainable levels. Fuels can also cause overheating if it burns too fast and easily. Contaminants in the solid fuels especially, for example excessive sulphur and nitrous oxides can cause corrosion when they get in contact with moisture, which results in metal corrosion.

To prevent overheating, engineers and boiler operators need to:

- ✓ Prevent scaling on both the fireside and waterside areas of the boiler
- ✓ Install or use mechanisms that will reduce heat levels on the metal components with high overheat areas like the combustion chamber. Examples of protective materials include refractory brick use,

protective shrouds/shields on likely overheat points and fitting ceramic ferrules onto exposed tubes ends.

- ✓ Inspect refractory/brickwork frequently and repair as soon as damage is seen
- ✓ Check for ID fan [boiler mounted fans especially] vibration and rectify if excessive vibrating is present. Avoid water hammer. All vibrations reaching boiler can weaken your refractory which can expose the protected areas to excessive temperatures
- ✓ Maintain safe water levels in the boiler [include water level controls testing every shift] to maintain adequate cooling. Superheater/serpentine elements are particularly vulnerable<sup>7</sup>
- ✓ Inspect pressure parts for unusual deposits and clean the deposits off occasionally
- ✓ Ensure correct firing, for example by not over-supplying fuel and preventing fire blow backs

Ferrules to save tube ends



#### 5. Poor idle storage risk

Periods of boiler idleness require adequate steps that prevents failure, especially through corrosion.

Serious metal and component deterioration can occur during those brief or long periods of boiler idleness. The author has witnessed shocking damage cases in which boilers suffered extensive corrosion that necessitated major repairs on fairly new boilers that had not been in use for different periods of time.

It is therefore prudent that the correct idle storage techniques are applied each time there is going to be a lengthy period of boiler idleness. Two major techniques are used, depending on the anticipated off range duration and these are:

##### a. **Wet storage**

When the period of idleness is not very long, say a week or a few weeks, you can use wet storage techniques. This method requires the addition of adequate oxygen scavenger chemicals in the completely flooded boiler. This ensures removal of any oxygen that could be present in the boiler water and thus prevent metal corrosion. It is critical to ensure that all potential oxygen entry points are also adequately sealed to prevent fresh entry of the gas.

b. **Dry storage**

This is applied when the duration of idleness is going to be long. In this case, a light fire is used to dry out the waterside of the completely **drained** boiler. Once the boiler has been adequately dried, the manhole and other inspection holes are completely sealed, and adequate desiccant material left in the boiler to absorb any leftover moisture. Additional desiccant may be required from time to time when the idleness duration gets excessively long.

**Conclusion**

The author has covered the major safety risks and potential causes and thus recommends that readers make further reading to get a firm grasp of these and other potential risk areas. Life is precious and there is no need for any injuries and equipment damage that are caused by unsafe acts and poor operating procedures by boiler users. We all need to appreciate that when boiler failure and serious injuries occur during normal operations, investigations will be done and prosecution issues may arise, where negligence is proven.

The issues covered above must also be complemented, in their mitigation, by the provision of adequate and suitable protective clothing and equipment for people that work in our boiler houses. The boiler house also requires adequate lighting that allows clear and easy monitoring of all operating conditions. **Last, but not least, our boiler houses must be restricted areas where unauthorised persons should never be allowed. We have had cases where injuries involved people that were not supposed to be in the vicinity of the boiler house at all. In some cases, we even find, during winter, people coming to the boiler house to warm themselves, exposing themselves to serious inherent dangers of these restricted areas.**

**The use of unregistered and makeshift boilers is a nonstarter and failure to observe this requirement can lead to prosecution. Let us all strive for zero harm and preserve life and limb.**

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## REFLECTING ON THE WORLD DAY FOR SAFETY AND HEALTH 2023 – ZIMBABWE

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### 1. Introduction

The World Day for Safety and Health at work is celebrated worldwide every year on 28 April to promote the prevention of occupational accidents, injuries and ill-health. It is a campaign to raise awareness and bring national and international attention and focus on the problems of work-related accidents, injuries, and deaths.

As far back as 2003, the ILO started to observe the World Day for Safety and Health, emphasising on the importance of preventing occupational accidents, injuries and diseases under pinned by ILO strong traditional legacy of tripartism and social dialogue. Such commemorations have always been a key component of the global strategy on occupational safety and health (OSH) wherein all tripartite arrangements have a responsibility for preventing deaths and disabling injuries due to work. Government has the responsibility to provide a national system that include making OSH laws, systems of inspection to ensure compliance with the applicable legislation as well as programmes to ensure safe and healthy work environments from which workers remain employable and enterprises blossom and flourish. On the other hand, employers have the responsibility to ensure the creation of safe and healthy work environments while workers are responsible for working safely, protecting themselves and others as well as knowing their rights to a safe and healthy work environment while participating in implementation of preventive measures.

At its 110<sup>th</sup> International Labour Conference (ILC) in June 2022, the tripartite session resolved to include “a safe and healthy working environment” as a fundamental principle and right at work in the ILO Declaration of Fundamental Principles and Rights at work. Indeed, this was a historic decision that further entrenched the concept that safe and healthy work environments are critical to decent work.



Hence, this year we commemorate the World Day for Safety and Health under the befitting theme **“A safe and healthy work environment: A fundamental Principle and Right at Work”**. In this regard organisations from all sectors join the nation to commemorate this day in Masvingo on 28 April 2023.



Figure 1: The Team from Mimosa Mine





**Figure 2 Companies showing off their banners**

## **2. Overview national injury statistics and cost of occupational injuries**

National occupational disabling injuries and fatalities recorded the past five years 2018 to 2022 have not been pleasing at all. In 2018, 4301 injuries were recorded of which 76 were fatalities, while in 2019 injuries rose to 5082 of which 49 of them resulted in fatalities. In 2020 injuries though slightly decreased from the previous year of 2019, remained elevated at 3528 with 45 of them being fatalities and in 2021 injuries further significantly spiked to 5641 with 42 fatalities being recorded. In 2022 injuries recorded remained highly elevated at 4800 of which 75 of them resulted in loss of life during the course of work. Indeed, these injury and fatality statistics reflects work environments that are generally hazardous to work in as further buttressed by the Lost Time Injury Frequent Rate (LTIFR) (an index that show how hazardous a work environment is), remained well above 1 over the past 5 years. In 2018 LTIFR was 3.4, 2019-4.0, 2020-2.4, 2021-2.9 and 2022-1.8, against an expected rate of less than 1 as spelt out in our national OSH Policy of 2021.

Additionally, it should be noted that in a study carried out by the Division of Occupational Safety and Health (OSH) in NSSA in 2019, it was demonstrated that over a 10-year period of 2009 to 2018, as much as **US\$438 814 090.00** was lost due to occupational injuries and fatalities. This was estimated to translate to about 0.3% of



GDP or about US\$44 million per annum being lost due to occupational injuries and diseases. Mining, agriculture, commerce and distribution, personnel services, transport and storage, local authorities, food, drink and tobacco processing, fabricated metal production and building and construction were the top 10 industrial sectors driving injury costs, with medical costs taking up as much as 47% of direct cost of injuries. The amount of money lost through occupational injuries is far too high for a small economy like Zimbabwe, hence a coordinated approach amongst all social partners is crucial to cut back significantly occupational injuries and diseases obtaining in industry.

### **3. What can we do to reverse the scourge of occupational accidents, injuries and diseases**

**3.1.** Government is working tirelessly to ensure that the country has a robust renewed OSH legislative framework that is consistent with international best practice, ensuring that it is well aligned with ratified ILO OSH conventions, standards and guidelines. Additionally, government fully subscribes to the historic decision at the 110<sup>th</sup> session of the ILC in which a safe and healthy work environment is now a fundamental principle and right at work. Indeed, government is fully committed to ensure the envisaged OSH legislative framework also clearly gives expression and effect to a “safe and healthy work environment being a fundamental principle and right at work.

**3.2** Furthermore, enterprises are expected to put in place measures that inculcate a zero harm mindset during the course of work. Among other key aspects enterprises are expected to

**3.2.1 Strong leadership commitment towards OSH matters.** Every employer, every executive and every manager is responsible for safety and health in their enterprise. Leadership demands open communication and a clear management culture. Good leadership is exhibited for example by predictability, consistency and attentiveness. Executives and managers are role models: they lead by example. They establish the rules and they follow the rules. What managers do, tolerate and demand sets the standard for other employees.

**3.2.2 Carry out a comprehensive hazard identification and risk assessment.** Use risk assessment to identify hazards and risks before accidents, injuries and production downtimes occur. This assists with evaluating the risk potential as well as establishing

and documenting the required preventive and protective measures. Evaluating occupational accidents, injuries, diseases and near-misses is important for identifying main focus points or potential improvements.

### **3.2.3 Clearly define targets around which programmes have to developed and implemented. Options for a goal-oriented, programme-based approach is crucial.**

Either you set a goal to continuously reduce the number of accidents, or establish themes to focus on such aspects as the operation of machines, office safety, the use of forklifts and personal protective equipment, or reduction of dust exposure. Employees need to recognize that their safety and health is important to them personally and that something is being done in the enterprise. Communicate regularly about the achievement of goals.

### **3.2.4 Ensuring that a safety and health system is well established and effectively organised to deliver.**

With well-organized occupational safety and health, every enterprise runs more smoothly because disruptions, production downtime and quality problems are reduced. Develop Checklists that can help. Those who want to do more should implement an **OSH management system** that allows for continuous improvement.

### **3.2.5 Ensuring the safety and health of machines, equipment and workplaces.**

Effective occupational safety and health strategies include technical, organizational and personal measures. Technical measure should take precedence. It is essential to keep machines, facilities, equipment and also the workplaces up to current OSH standards. Naturally, it is not always possible to use the latest technology. This is where retrofitting is required. Procurement and purchasing has to understand that safety comes first and that the principle that safe equipment must be part of any activity has proven itself to be a licence to operate and to continue to be in business. It important to note that most accidents occur in the course of troubleshooting, repairs or maintenance because design and construction is often not applicable to these tasks and also because safety devices are bypassed or fail to function.

### **3.2.6 Ensuring that competences of various levels of employees are continuously improved.**

It is a top management responsibility to make sure that a detailed description of the qualification requirements for every position in your enterprise has been made and that every worker is able to perform the duties of his or her position. The half-life of knowledge is growing shorter and shorter, and the skills of workers need to be refreshed at regular intervals. Providing training and continuing education is a must.

### **3.2.7 Investing in people by motivation and inspiration of good OSH performance.**

Motivating employees to act in a safe and healthy manner is one of the most important leadership responsibilities. Enterprises that show appreciation for their employees and also actively involve them in safety and health within the enterprise are tapping into important potential: **their knowledge, abilities and idea**. The goal is for everyone to look after their colleagues as well as themselves; [**one for all and one for all**].

### **3.3 Workers on the other are obligated among other issues to:**

- i. Take reasonable care of the safety and health of themselves and others.
- ii. Co-operate with employers in their efforts to comply with OSH requirements.
- iii. Follow procedures in the performance of any task at work.
- iv. Report all accidents and near-misses to their supervisors.

## **4. Conclusion**

As we reflect on the above injury statistics and the implication of such disabling injuries and fatalities on the workers affected together with their families, as well as the economy at large, the World Day for Safety and Health at Work should remind us as a nation and the key tripartite partners (government, employers and labour) to galvanise all our efforts to stop this carnage obtaining amongst our workers. It is highly uncalled for to lose lives, workers getting disabled and, in some cases, rendering some of our workers paraplegic and quadriplegic, significantly reducing their employability because of work.

As we march towards the upper middle-income status as a nation by 2030 and make our nation highly competitive on a global scale, let us all be geared up to create safe and healthy work environments around which our productivity as a nation hinges.

**\*\*BE PART OF THE SOLUTION TO A SAFE AND HEALTHY WORK  
ENVIRONMENT IN ZIMBABWE\*\***



**SPEECH BY THE HONOURABLE MINISTER OF PUBLIC SERVICE, LABOUR AND SOCIAL WELFARE PROF PAUL MAVIMA AT THE OCCUPATIONAL SAFETY AND HEALTH LEADERSHIP BREAKFAST SEMINAR, 31 MAY 2023, CRESTA LODGE, HARARE**

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**Esteemed Leaders of Organisations, Companies and Enterprises**

**Good morning to you all.**

It gives me pleasure to address such an important decision-making audience around a subject matter of Occupational Safety and Health that government regards with high importance.

The theme for this seminar "**Safe and Healthy Work Environment: A fundamental principle and right at work**" is quite befitting as it comes against a historic decision by International Labour Organisation (ILO) at ILC in June 2022 in which it has declared that a safe and healthy work environment is a fundamental principle and right at work. Indeed, leadership must clearly appreciate that safe and healthy working conditions are fundamental to decent work. Hence the protection of workers' safety and health must feature prominently among the objectives and targets of leadership in whatever occupational setting they occupy.

Let me try to put issues into perspective by sharing with you a few national occupational injury statistics over the past five years to date.

National occupational disabling injuries and fatalities recorded the past five years 2018 to 2022 have not been pleasing at all. In 2018, 4301 injuries were recorded of which 76 were fatalities, while in 2019 injuries rose to 5082 of which 49 of them resulted in fatalities. In 2020 injuries though slightly decreased from the previous year of 2019, remained elevated at 3528 with 45 of them being fatalities and in 2021 injuries further significantly spiked to 5641 with 42 fatalities being recorded. In 2022 injuries recorded remained highly elevated at 4800 of which 75 of them resulted in loss of life during the course of work. Over the first 4 months of this year January – April 2023, we have already recorded 1454 disabling injuries of which 24 were fatalities. Indeed, these injury and fatality statistics reflects work environments that are generally

hazardous to work in as further buttressed by the Lost Time Injury Frequent Rate (LTIFR) (an index that show how hazardous a work environment is), remained well above 1 over the past 5 years. In 2018 LTIFR was 3.4, 2019-4.0, 2020-2.4, 2021-2.9 and 2022-1.8, against an expected rate of less than 1 as spelt out in our national OSH Policy of 2021.

What do these statistics mean to us as leadership in various sectors of the economy? As we reflect on these statistics, it is critical to understand that these numbers mean real human beings who suffer the consequences of failure of safety and health systems and failure on part of organizations' decision makers to invest in OSH.

Additionally, it should be noted that in a study carried out by the Division of Occupational Safety and Health (OSH) in NSSA in 2019, it was demonstrated that over a 10-year period of 2009 to 2018, as much as **US\$438 814 090.00** was lost due to occupational injuries and fatalities. This was estimated to translate to about 0.3% of GDP or about US\$44 million per annum being lost due to occupational injuries and diseases. Mining, agriculture, commerce and distribution, personnel services, transport and storage, local authorities, food, drink and tobacco processing, fabricated metal production and building and construction were the top 10 industrial sectors driving injury costs, with medical costs taking up as much as 47% of direct cost of injuries. The amount of money lost through occupational injuries is far too high for a small economy like Zimbabwe, hence a coordinated approach amongst all social partners is crucial to cut back significantly occupational injuries and diseases obtaining in industry, and in particular leadership in industry holds the key to realise recognisable reduction in occupational accidents and diseases.

I have shared with you this data with a view to stimulate robust decisions on how all of us as leaders can be part of **solutions to significantly** reduce occupational injuries and diseases occurring in our workplaces.

Let me further point out that OSH has become a key variable for measuring the nation's development and its competitiveness globally. The President HE President E.D. Mnangagwa has repeatedly highlighted that we are marching towards the upper middle-income status by 2030. The hazardous nature of our work environment does not reflect the thrust espoused by the President. Hence leaders in industry need to adopt a zero-harm mindset to deliver on OSH effectively in the workplace. Senior leadership including Board of Directors have the duty of care and have an obligation in exercising **due diligence** to ensure effective preventive measures are put in place to prevent harm.

Let me further emphasise that the protection of safety and health of employees who may be affected by activities is a critical part of risk management and hence must be led by senior leadership of companies that include the Chief Executive Officer and Board of Directors. In this regard, company leadership should ensure that OSH appear regularly on the agenda of Board meetings. OSH is a corporate governance issue wherein the Board and Company's Executive Management should integrate OSH into the main governance structures including Board Sub-Committees on OSH and Risk. It is insightful to note that the Turnbull guidance on the Combined Code on Corporate Governance compels companies to have robust systems of internal controls that covers **not** only financial risks but risks relating to OSH, environment and business reputation. I implore leadership in all companies to revisit their corporate governance arrangements and see to it that OSH is part and parcel of strong internal control system with the aim of registering zero harm amongst employees.

Let me draw your attention to two key OSH fundamental Conventions that leadership must understand, embrace and implement their provisions: Following the ILO decision to make safety and health a fundamental principle and right at work, Convention 155 on OSH and Convention 187 on the promotional framework on OSH have now become fundamental core Conventions that provides a key framework for an effective OSH system both at national and enterprise level. These two Conventions constitute blueprints for sustainable improvements towards the provision of safe and healthy work environments. Additionally, the principle of prevention which is the core of OSH is well expressed in both the fundamental Conventions No. 155 and 187. The provisions of these fundamental Conventions have found expression in the OSH Bill that is expected to become law in the near future. Hence, I appeal to organisation leadership in all branches of economic activity to take time to understand the provisions in Convention 155 and 187 read together with their recommendations R164 on OSH and recommendation R197 on the promotional framework on OSH. Government will see to it that these Conventions are fully implemented both at national and enterprise level more so that government has ratified Convention 155 and consideration is also being given to ratify Convention 187. The provisions of these Conventions together with other ratified Conventions will certainly find full expression in envisaged OSH Statutory Instruments that will further support the new OSH law.

Having said this, I wish to challenge leadership in various sectors of the economy to envisage a work environment that is free from hazardous exposures, setting targets to attain a Lost Time Frequency Rate of less than 1 at each and every workplace, thus in turn contributing to a national injury frequency rate that demonstrate that as a nation

we are moving towards an upper-middle income and highly competitive nation by 2030.

I call upon all of you to be inspired to step up preventive measures, share good OSH practices and develop initiatives that raise workplace safety and health standards in your respective enterprises. I look forward to be able to share with you improved national OSH performance in the future as you are the key enablers of the envisaged hazard free work environments in Zimbabwe.

**I thank you for your attention.**

## OSH CALENDER OF EVENTS 2023



<u>ITEM</u>	<u>PROGRAMME/ EVENT</u>	<u>DATE</u>	<u>VENUE</u>
1.	ZOSHC Meeting	28 Feb	NSSA Boardroom
2.	OSHEMAC I, Intake 1	6 Feb – 31 March	Hre & Bulawayo
3.	Doctors' Course	08 – 12 May	Harare
4.	*Engineers Workshop	29 – 31 March	TBA
5.	Radiographers Workshop	12 – 14 April	TBA
6.	<b>National Safety and Health Week</b>	<b>24 – 28 April</b>	All Regions
	*Leadership Breakfast Seminar	25 April	Harare
	OSH Policy & Vision Zero Campaigns	24 – 27 April	All Regions
	*World Day for Safety and Health	28 April	Masvingo
7.	*Rehab Centre Open Day	19 May	Rehab Centre, Byo
8.	OSHEMAC II, Intake 1	02 May – 23 June	Hre & Bulawayo
9.	ZOSHC Meeting	31 May	NSSA Boardroom
10.	Kamandama Commemorations	06 June	Hwange
11.	Boiler Operators' Course	TBA	In regions
12.	Responsible Persons Workshop	TBA	In regions
13.	OSHEMAC I Intake II	24 July – 15 Sept	Harare & Byo
14.	Safety Representative Course	TBA	In regions
15.	Nurses' Course	24 – 28 July	TBA



16.	ZOSHC Meeting	30 August	NSSA Boardroom
17.	*Safety & Health at Work (SHAW) Conference & Awards Dinner	03-05 Oct	Elephant Hills, Vic Falls
18.	NSSA GM's Golf Tournament	06 Oct	Elephant Hills
19.	OSHEMAC II, Intake II	16 Oct – 08 Dec	Harare & Byo
20.	ZOSHC Meeting	22 Nov	NSSA Boardroom

\*The Honourable Minister of Public Service Labour and Social Welfare officiates