

**AN AUDIT SYSTEM FOR REGULATORY AUTHORITIES AND  
PROFESSIONAL BODIES TO ASSESS THE OPERATIONAL  
COMPETENCE OF OCCUPATIONAL HYGIENE APPROVED  
INSPECTION AUTHORITIES**

By

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## DECLARATION

I, Conrad Bosch declare that this research report is my own work. It is being submitted for the degree of Master of Public Health in Occupational Hygiene in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other University.

Signed:.....

Date:.....

*To them who were there through it all...*

*My father and mother*

*and my wife*

*Glory to the Lord!*

## **ABSTRACT**

In South Africa the assessment of exposure to occupational hygiene stressors or environmental factors in workplaces covered by the Occupational Health & Safety Act, Act No. 85 of 1993 must be performed or at least verified by an Approved Inspection Authority for occupational hygiene. However, no formal system is in place to effectively audit and score operational work of Approved Inspection Authorities for occupational hygiene.

Formal auditing is a requirement of internationally accepted and implemented management systems such as the International Standards Organisation (ISO) 9001: 2000, Quality Management System – Requirements, the British Standards Institution - Occupational Health and Safety Series (OHSAS) 18001: 1999, as well as the International Standard - ISO 14000: 2004: Environmental Management System.

To develop an audit system for Approved Inspection Authorities for occupational hygiene, a descriptive research project that gathered relevant data through electronic questionnaires was conducted with the objective of identifying audit elements and a general scoring system as well as the development of an audit tool that can be applied by regulatory authorities, professional bodies and even competent persons to audit operational work of Approved Inspection Authorities for occupational hygiene.

This study had a sample population of 40 Approved Inspection Authorities for occupational hygiene, all based in the Gauteng Province, the province which had the largest number of Approved Inspection Authorities for occupational hygiene. A questionnaire was compiled from local and international audit elements and emailed to the study population for electronic completion. The cover letter and study questionnaire is appended as **ANNEXURE A** and **ANNEXURE B** respectively. The Ethics Committee – Clearance Certificate is appended as **ANNEXURE C**.

The questionnaire listed the proposed audit elements and a number of questions relating to the registration of the Approved Inspection Authority for occupational hygiene. A scoring mechanism was also suggested. Questions asked in the questionnaire applied the equivalent-form approach whereby as far as reasonably practicable each question was rephrased so that it “appeared different”, but effectively asked the same question.

The study had a response rate of 65%, or a total of twenty six returned questionnaires. The respondents were in agreement that the elements; *Organisation & Administration, Human Resources, Accommodation & Environment, Equipment, Measurement & Testing as well as Occupational Hygiene Services & Documentation* were applicable to an audit for Approved Inspection Authorities for occupational hygiene. Twenty two or 84.6% of the respondents strongly agreed that the said elements were adequate for an occupational hygiene audit. Four or 15.4% of the respondents disagreed, responding that the proposed elements were not adequate for an audit of Approved Inspection Authorities for occupational hygiene.

Four of the 26 respondents indicated that the elements; *Suppliers & Accommodation* should be excluded from the proposed occupational hygiene audit. Twenty two or 84.6% of the respondents strongly agreed that audits are effective in the identification of poor quality work and the subsequent need for corrective measures.

Forty two percent of the respondents agreed to the use of the four point scale applied by most of the CONCAWE member companies (Brussels), which was suggested for the proposed audit of the Approved Inspection Authorities for occupational hygiene. Two of the respondents preferred the use of the terms “comply” and “not comply” instead of a numerical rating or scoring mechanism. Two respondents stated that they preferred the use of a five point scale (numbers 1 – 5) as a scoring mechanism.

Six of the respondents stated that they would use a different scoring mechanism but did not explain, or elaborate on their statement. Five respondents did not complete the section on the suggested scoring mechanism.

On the subject of adequate scores the study found that 18 of the respondents suggested a score of not less than 80% (out of a possible 100%). The majority of respondents indicated that a score of less than 60% warranted corrective action from the Department of Labour or the Southern African Institute for Occupational Hygiene.

The majority of respondents preferred the legal appointment of the Department of Labour as the body permitted and approved to audit the operational activities of Approved Inspection Authorities for occupational hygiene.

From the results of the study the researcher concluded that a need exists for a formal auditing and scoring system for operational work of Approved Inspection Authorities for occupational hygiene.

A proposed audit tool was designed and is appended.

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## **NOMENCLATURE**

AIA	-	Approved Inspection Authority
DoL	-	Department of Labour
OHS Act	-	Occupational Health & Safety Act, No. 85 of 1993
CONCAWE	-	Conservation of Clean Air and Water in Europe
HCS	-	Hazardous Chemical Substance
SAIOH	-	Southern African Institute for Occupational Hygiene
OH	-	Occupational Hygiene
MHI	-	Major Hazard Installation
RA	-	Risk Assessment
IBs	-	Inspection Bodies
SANAS	-	South African National Accreditation Scheme
SHMS	-	Safety and Health Management Systems
COP	-	Code of Practice
SAS	-	South African Standard

# CHAPTER 1 INTRODUCTION

## 1.1 BACKGROUND

In South Africa, for the purpose of monitoring occupational hygiene stress factors, a person must be registered as an Approved Inspection Authority (AIA) for occupational hygiene with the Department of Labour, Chief Directorate: Occupational Health & Hygiene. Registration occurs only after meeting the requirements referred to in the Information Brochure No. 1, 2004 on Approved Inspection Authorities for occupational hygiene <sup>(1)</sup>. In addition, approval is only given to legal persons. The occupational hygienist applying for the approval on behalf of the “legal persona” will ultimately be held responsible, as well as liable for the acts and omissions of the Approved Inspection Authority for occupational hygiene <sup>(1)</sup>.

Apart from the appointment of occupational hygienists, the Approved Inspection Authority for occupational hygiene may appoint occupational hygiene technologists and/or occupational hygiene assistants all of which are permitted to perform various tasks associated with the Approved Inspection Authority <sup>(1)</sup>.

Different requirements are set for each of the three categories of occupational hygiene personnel, including the occupational hygienist, occupational hygiene technologist and occupational hygiene assistant <sup>(1)</sup>. Approved Inspection Authorities for occupational hygiene may also appoint auxiliary staff such as administrative personnel. The said personnel may however not directly execute occupational hygiene work.

To be registered in the main category, that of an occupational hygienist, it is required of such a person to have a minimum academic qualification of M + 4 and a minimum of five (5) years relevant experience in the field of occupational hygiene. The academic requirements for registration as an occupational hygienist are currently under review. A further requirement for registration in the main category is a legal knowledge certificate in occupational hygiene legislation which includes mostly the OHS Act and its regulations and specifically those regulations directly applicable to occupational hygiene.

Inline with the requirements for occupational hygienists as set by the SAIOH, the South African Department of Labour (DoL), under the Chief Directorate: Occupational Health and Hygiene, has so far only developed and applied guidelines for organizations who wish to apply to become registered as Approved Inspection Authorities for occupational hygiene stress factors, in other words, requirements to be met in order to be awarded registration. The requirements were not developed with the intention of auditing and scoring operational activities of Approved Inspection Authorities once approval has been granted.

According to Information Brochure No.1, 2004, the prescribed functions of Approved Inspection Authorities for occupational hygiene include the assessment and monitoring of occupational hygiene stressors and issuing certificates, stating the findings to the person to whom the service is rendered.

The Information Brochure No.1, 2004 further specifies that the occupational hygienist is permitted to conduct occupational health risk assessments, walkthrough surveys, supervise *monitoring* surveys, evaluate *monitoring* results, prepare reports and recommend appropriate control measures within the ambit of the scope of work for which the Approved Inspection Authority is authorized. The term *monitoring* as used in Information Brochure No. 1, 2004 means more than just measuring an occupational hygiene stress factor. It also includes:

- the anticipation and recognition of the adverse health effects which could result from exposure to occupational hygiene stress factors;
- the measurement of prevailing conditions and the scientific interpretation of those measurement results;
- the evaluation of the potential impairment of health or well-being; and the formulation of recommendations for alleviation of such problems.

According to the Regulations for Hazardous Chemical Substances, 1995, promulgated under the OHS Act, "*monitoring*" refers to periodic or continuous determination of the amount of contamination present in an occupied region; used as a safety measure for purposes of health protection. The said regulations further defines the term "*assessment*" as implying a programme to determine any risk from exposure to a hazardous chemical substance associated with any hazard thereof at the workplace in order to identify the steps needed to be taken to remove, reduce or control such a hazard.

The DoL in their Information Brochure No. 1, 2004 further states that each Approved Inspection Authority for occupational hygiene must employ at least one occupational hygienist who is the person responsible and ultimately liable for all the acts and omissions of the Approved Inspection Authority and specifically the testing work and report authorization.

Approved Inspection Authorities for occupational hygiene must have the necessary documentation such as an original or copy of the OHS Act, and the relevant regulations promulgated under the said act. As part of the criteria for approval, each Approved Inspection Authority for occupational hygiene is further required to have a documented quality management system which must outline the processes, procedures and resources for implementing quality management <sup>(1)</sup>. The said processes and procedures for quality management should be based on the South African Standard – Code of Practice 17025 of 1999: *General requirements for the Competence of Testing and Calibration Laboratories*, previously known as the SABS 0259: 1999 (both standards which are set by the South African Bureau of Standards).

According to the Department of Labour, Approved Inspection Authorities for occupational hygiene are legally bound to the upkeep of the above general requirements in the form of a quality management system. The DoL Information Brochure No. 1, 2004 for Approved Inspection Authorities for occupational hygiene makes no reference to a follow-up audit once the recommendation following an initial audit (for approval purposes) has been forwarded to the Chief Inspector (of the DoL) and registration has been granted.

In order to execute the functions of an Occupational Hygienist specifically if such a person is employed by an Approved Inspection Authority for occupational hygiene, it is necessary to maintain registration with the Southern African Institute for Occupational Hygiene (SAIOH) as part of ongoing professional development.

SAIOH does not have any formal element based audit against which their members or specifically Approved Inspection Authorities for occupational hygiene are evaluated or audited. Only a point maintenance system is in place. It is an “honour” system of record keeping required for the professional development of all occupational hygienists, technologists and assistants. Annual re-registration with the SAIOH is dependant on payment of the annual fee and declaration that the member is still actively involved in the occupational hygiene field. In line with the points maintenance system of the SAIOH, registered members are required to amass points for various occupational hygiene activities. A certain minimum number of points have to be accrued over a five-year period in order to maintain certification. The points maintenance system also does not provide for formal qualitative auditing of Approved Inspection Authorities for occupational hygiene.

Nationally and internationally, quality management systems are subject to some sort of auditing. Audit systems provide for consistency to address quality concerns through allocation of resources, assignment of responsibilities, ongoing evaluation of practices, procedures and processes. It is also forms an essential part of the quality management aspect of health and safety<sup>(2)</sup>.

## 1.2 EXISTING AUDITS

An audit is a systematic independent examination to determine whether activities and related results conform to planned arrangements and whether these arrangements are implemented and are suitable to achieve the organization's policy and objectives <sup>(3)</sup>.

Audits have been developed for occupational health units and specifically occupational medicine by the Southern African Society for Occupational Medicine (SASOM) <sup>(4)</sup>. However, this SASOM audit is not purposely designed for the operational activities of Approved Inspection Authorities for occupational hygiene. It also does not assess competence of occupational hygiene staff. The format of this said audit is in addition not a point scoring system but rather a compliance rating of acknowledged best practices <sup>(4)</sup>.

Apart from the Occupational Health and Safety Series (OHSAS) 18001 and the voluntary British Standard (BS) 8800: 1996; Guide to Occupational Health and Safety Management Systems, the authors of the SASOM guideline for an occupational health audit are not aware of any other similar initiatives <sup>(5)</sup>. Therefore, the SASOM audit can not be regarded as a substitute audit specifically for Approved Inspection Authorities for occupational hygiene but rather a guideline.

The South African National Accreditation Scheme (SANAS) incorporated the South African Standard - ISO 17020: 1998, *General Criteria for the Operation of Various Types of Bodies Performing Inspection* as a guideline, setting criteria and elements to which an organization performing assessments, need to conform specifically if they wish to be certified in terms of the said South African Standard <sup>(6)</sup>.

SANAS requirements and the ISO 17020, 1998 are specifically used to accredit inspection bodies to conduct Major Hazard Installation Risk Assessments in terms of the Major Hazard Installation Regulations promulgated under the OHS Act <sup>(6)</sup>. However, the SANAS guideline or any other South African guideline or standard is not yet applied or enforceable for the management or auditing of the operational activities of Approved Inspection Authorities for occupational hygiene, therefore the need to put such an enforceable guideline in place.

The Conservation of Clean Air and Water in Europe (CONCAWE), Industrial Hygiene and Medical Subgroups (Brussels, March 2004) in their Occupational Health Auditing Report No. 5/04, describe guidelines and an approach to occupational hygiene auditing <sup>(7)</sup>. Their approach includes examples of typical questions and model answers on which an appropriate questionnaire for any location or activity may be based. However, it is an audit system designed specifically for Occupational Health auditing, subsequently not for the auditing of Approved Inspection Authorities for occupational hygiene.

Although general criteria for the management of inspection bodies as well as testing and calibration facilities have been developed by South African National Accreditation Scheme (SANAS), managed from the Council for Scientific and Industrial Research (CSIR) in Pretoria <sup>(8)</sup>, these protocols or criteria are normally guidelines effected through national codes of practice (COP), as opposed to being formal audit systems. They are in addition not specific to Approved Inspection Authorities for occupational hygiene.

The SAIOH which is the professional body for occupational hygiene professionals/practitioners in Southern Africa also does not provide for any kind of formal qualitative auditing of Approved Inspection Authorities for occupational hygiene apart from an honour system for the upkeep of professional development and registration <sup>(9)</sup>.

The existing registration system for Approved Inspection Authorities for occupational hygiene regulated by the DoL does not provide for auditing of the Approved Inspection Authority for occupational hygiene to the extent of evaluating a comprehensive list of elements or criteria and scoring the performance of the Approved Inspection Authority for occupational hygiene in each of the categories, even after it has been approved and its registration number has been awarded <sup>(10)</sup>. The existing application and approval system applied by the DoL rather includes a formal application process whereby specific information is requested by the applicant (wishing to register an Approved Inspection Authority for occupational hygiene) with emphasis on specific application and reporting items <sup>(10)</sup>.

The current application and reporting items set for Approved Inspection Authorities can be summarized as follows:

- Information to be listed by the applicant
- Technical Performance
- Standard of Files
- Organization
- Supervision
- Public (Client) Relations and Development Services
- Personal and Professional Development

The initial application is evaluated against above elements but without any formal scoring mechanism. According to the DoL Information Brochure No. 1, 2004, “Application” and “Ability” is checked rather than numerical scoring or rating. The current requirements for the approval of Approved Inspection Authorities as set by the DoL in their Information Brochure 1, *Annexure III* are given in **ANNEXURE D**.

Inline with the format of international quality management systems and checklists based on the OHS Act, the audit intended for Approved Inspection Authorities for occupational hygiene should be a systematic approach whereby an Approved Inspection Authority can be evaluated and the quality of its work be expressed quantitatively.

### **1.3 RECOMMENDED AUDIT ELEMENTS**

South African Standards such as the SANS 17020 and 17025 which may be regarded applicable to inspection bodies as well as to testing and calibration laboratories, list structural elements (consisting of a number of sub elements) which must be included in a quality management system. DoL requires of an Approved Inspection Authority for occupational hygiene to have processes, procedures and a general quality management system which is based on the elements (and sub elements) listed in SANS 17025, 1999.

The above said South African Standards and the SASOM guideline for an occupational health audit - occupational medicine and occupational hygiene; listed the following elements as significant to such an audit:

- Policies and Objectives
- Organization and Resources
- Legislation
- Risk identification and Assessment
- Risk communication and Risk management in the working environment
- Occupational Hygiene programme and standards
- Occupational Medicine Facilities and Services
- Emergency Planning and Records
- Amenities and Sanitary facilities
- Performance monitoring, and review

According to the Conservation of Clean Air and Water in Europe (CONCAWE), Industrial Hygiene and Medical Subgroups (Brussels, March 2004) in their Occupational Health Auditing Report No. 5/04, occupational health auditing and specifically occupational hygiene auditing must focus on at least the following aspects:

- Organization and management and Assessment of health risks
- Control of health risks and Monitoring of performance,
- Non-routine situations, Training and Awareness,
- Documentation, Data Integrity and Record keeping, and
- Audit and review

Cronje, 2005; 24 in his proposal for an Evaluation Model to Determine the Suitability, Adequacy and Effectiveness of Health and Safety Management Systems has found the following main elements to occur in 22 different safety and health management systems <sup>(11)</sup>:

- Hazard Identification and Control
- Auditing and Self Assessment
- Accountability, responsibility and Authority
- Training
- Preventative and Corrective Action
- Planning & Development
- Technical Expertise
- Personnel Qualifications
- Communication

- Management Commitment and Resources
- Employee Participation
- Manual and Procedures
- Records
- Management Review
- Goals, Objectives and Performance Measures
- Regulatory Compliance

The audit elements listed in the SANS 17020 and 17025 respectively as well as those suggested by SASOM and the CONCAWE which to a large extent corresponded with the sixteen independent but interrelated system elements listed in the proposal for an Evaluation Model to Determine the Suitability, Adequacy and Effectiveness of Safety and Health Management Systems (Cronje, 2005; 24) <sup>(11)</sup> and the application information and report requirements set by DoL for persons applying to become Approved Inspection Authorities for occupational hygiene were used by the researcher to compile a questionnaire which was mailed to the sampling population.

The audit elements (and sub elements) that are suggested as meaningful or important are given in **ANNEXURE E**.

## **1.4 PROBLEM STATEMENT**

No formal and specific element (and sub element) based system with an appropriate scoring mechanism exists for use by regulatory authorities, professional institutions and clients in general to audit and assess the work of Approved Inspection Authorities for occupational hygiene once approved by the DoL.

## **1.5 OBJECTIVES**

The audit system resulting from this study will address general requirements set for Approved Inspection Authorities for occupational hygiene and have the following objectives:

- 1.5.1 To act as a tool or comprehensive list of elements and sub elements according to which Approved Inspection Authorities for occupational hygiene can be audited.
- 1.5.2 To suggest a quantitative scoring mechanism which can be used to rate the operational activities of Approved Inspection Authorities for occupational hygiene.

## **1.6 BENEFITS OF THE STUDY**

The main benefit of this study is that it will result in a tool or list of audit elements that can be used by regulatory authorities, professional bodies and competent persons in general to audit the operational competence of an Inspection Authority that has been approved in terms of the OHS Act for the measurement and assessment of occupational hygiene stresses including, Thermal Stress, Noise, Illumination, Ventilation, Air Monitoring – Asbestos, Lead and Hazardous Chemical Substances. An additional benefit is that the elements will serve as a tool for the DoL, the SAIOH as well as any other professional body or competent person to audit and assess the daily and routine activities of an occupational hygiene Approved Inspection Authority, through use of a scoring mechanism.

The score in the form of a numerical value can be compared to recommended scoring criteria to objectively judge the compliance and procedures of work performed by the Approved Inspection Authority for occupational hygiene, which is a further benefit that will arise from this study. Unacceptable deviations from the guidelines can be defined and measures can be put in place for formal investigations and review of registrations of the Approved Inspection Authorities in question.

The scores or quality ratings, in addition, can be used by competent persons as a tool in the selection of a preferred service provider or Approved Inspection Authority for occupational hygiene, to i.e. judge “value for money” in the event where a consulting Approved Inspection Authority for occupational hygiene is to be selected and awarded i.e. contractual work.

## **CHAPTER 2 RESEARCH METHODOLOGY AND ANALYSIS**

### **2.1 METHODOLOGY**

#### **2.1.1 Research Type**

This study is a descriptive study based on findings summarized from questionnaire responses returned by respondents in the study population.

#### **2.1.2 Developing a Draft Audit Tool**

Electronic questionnaires, articles in scientific journals, internet references, Approved Inspection Authorities for occupational hygiene and a personal interview with a Sub Directorate Manager from the Directorate: Occupational Health and Hygiene, Department of Labour were used as sources of information to determine what audits or auditing guidelines currently exist for South African based Approved Inspection Authorities for occupational hygiene.

A comprehensive list of elements from all the said reference sources which included elements and sub elements that covered aspects relevant to the work of Approved Inspection Authorities for occupational hygiene and the DoL Information Brochure No.1, 2004 was included in a questionnaire which was electronically mailed to the sample population.

### **2.1.3 Scoring**

For the purpose of this study and taking into account the limitations of the study, the scoring system suggested is adopted from the four model answers used by most of the CONCAWE member companies. The suggested scoring mechanism provides for a four point scale or the following four (4) possible answers:

- Score 0: Immediate action needed
- Score 1: Major deficiencies
- Score 2: Minor deficiencies
- Score 3: Fully compliant

In order to award a specific score or rating on a subject (or specifically an audit element) the Approved Inspection Authority's compliance with legislation or approved sampling technique, measurement procedure or guideline (as the case may be) may be evaluated and a score or rating awarded accordingly.

The overall rating can be determined by adding all the scores and calculating the total (from all the scores) to reflect the Approved Inspection Authority's compliance with legislation and/or requirements and guidelines set for its daily operation.

## **2.2 SAMPLE POPULATION**

### **2.2.1 Size**

The sample population consisted of 40 Inspection Authorities approved for occupational hygiene out of a total of 86 Approved Inspection Authorities, currently registered in South Africa for specifically occupational hygiene. It also included a personal interview with a Sub Directorate Manager from the Department of Labour. Twenty six of the Approved Inspection Authorities for occupational hygiene completed and returned their questionnaires.

According to the records of DoL the majority of Approved Inspection Authorities for occupational hygiene are based in the Gauteng Province. The study focused on this province with the highest number of Approved Inspection Authorities for occupational hygiene and therefore the inclusion of 40 Approved Inspection Authorities into the study population, also because their up to date electronic contact details were available from the Department of Labour (DoL).

### **2.2.2 Approval**

The 40 Approved Inspection Authorities for occupational hygiene included authorities that are approved for at least one of the occupational hygiene stressors which includes; physical stressors, chemical stressors, biological stressors as well lead and asbestos. However, the majority of Inspection Authorities were approved for several of the said occupational hygiene stressors.

In accordance with the approval criteria set by the DoL for Approved Inspection Authorities for occupational hygiene, the Inspection Authority can be “approved” for any or all of the occupational hygiene stressors. All of the Approved Inspection Authorities for occupational hygiene included in the sampling population employed at least one occupational hygienist as is required by the DoL.

### **2.2.3 Data Collection**

Data were collected through means of electronic questionnaires (See **ANNEXURE B**) that were returned after completion. Audit elements were proposed and supportive questions were asked. Where applicable, a four-point scale was used to force decision because a five-point scale provided the possibility of a neutral answer.

Questionnaires were e-mailed to the registered office of the Approved Inspection Authorities for occupational hygiene included in the sampling population. The questionnaire was preceded by a cover letter explaining the purpose of the research project, the instructions for completing the questionnaire as well as the ethical clearance number of the research. It was also mentioned in the cover letter that the SAIOH had also supported the research.

The cover letter is attached as **ANNEXURE A**. The Questionnaire is attached as **ANNEXURE B**.

As part of the questionnaire, certified occupational hygienists representing the Approved Inspection Authorities were asked to complete short questions pertaining to the “Occupational Hygiene Approved Inspection Authority – Audit” in some instances expressing their answers as numerical scores, and returning the questionnaire once completed. The Approved Inspection Authorities were allocated a period of four weeks after which the same electronic questionnaire was mailed a *second* time. Four weeks later the questionnaire was mailed a *third* time to increase the response rate. Responses were further encouraged through means of a fourth email reminder and in some instance also a telephone call. An additional four weeks were allowed for completion and return, after which the data processing commenced.

#### **2.2.4 Data Organization and Presentation**

Data from the completed questionnaires were extracted, grouped and organized into quantitative discrete information in order to enable its interpretation. Data are summarized through means of tabulation of results as well as discussions which are followed by conclusions.

#### **2.2.5 Ethical Clearance**

Ethical approval for the study was obtained from the University of the Witwatersrand, Human Research Ethics Committee (Medical) – Reference Number R14/49 Bosch. The ethical clearance certificate is attached as **ANNEXURE C**. All collected data were kept strictly **confidential**. No respondents were identified or are referred to in this research report.

## **CHAPTER 3            RESULTS**

### **3.1            INTRODUCTION**

Electronic questionnaires were mailed to 40 Approved Inspection Authorities for occupational hygiene, all based in the Gauteng Province. Data were gathered on audit elements and sub elements as well as a suggested scoring mechanism. Respondents were asked to respond on scores they regarded as adequate and scores warranting corrective actions. The questionnaire also asked respondents to indicate the actions they regarded as necessary to be taken against Approved Inspection Authorities for occupational hygiene that does not achieve the minimum score. They were also asked to quantify what they regarded as the minimum score.

The questionnaire had a final section where respondents could list any suggestions, recommendations or comments on the proposed audit system for Approved Inspection Authorities for occupational hygiene.

The results of this study included responses to the applicability of the main elements as well as the sub elements. It also covers the efficiency of audits and responses to the use of audits as management tools. The results list additional audit elements recommended by the respondents as well as responses to the suggested scoring mechanism.

Scores regarded as an adequate achievement in an audit as well as scores warranting corrective action is also tabulated.

The last section of the results shows the responses to corrective actions as well as some general comments from the respondents which included their preference in terms of the body or organization that should coordinate and administer the proposed audit.

### **3.1.1 Responses**

Out of the sample of 40 Approved Inspection Authorities for occupational hygiene, twenty six returned questionnaires, so 65% of the study sample responded. Two respondents or 5% indicated that they were too busy to complete the questionnaire. They mentioned telephonically that the nature of their consulting work did not allow them the free time to complete research questionnaires.

Eleven Approved Inspection Authorities for occupational hygiene did not respond, or return the questionnaires. They did not offer any reason either telephonically or in writing for not participating.

One respondent (2.5%) indicated that the study was obsolete. A summary of these responses is shown in Table 1.

**Table 1** Summary of respondent classifications and questionnaire responses

<b>Respondent Classification</b>	<b>Sample Size</b>	<b>Responses</b>	<b>Percentage</b>
Completed questionnaires returned	40	26	65
Non responses: without reason given	40	11	27.5
Non responses: time constraints	40	2	5
Non responses: study thought to be obsolete	40	1	2.5

## **3.2 AUDIT ELEMENTS**

### **3.2.1 Applicability of Audit Elements**

Respondents were asked to indicate the applicability of elements and sub elements suggested for the proposed audit of Approved Inspection Authorities for occupational hygiene. Elements from the DoL Audit List: Requirements for Approved Inspection Authority Approval (See **ANNEXURE D**) were also considered.

Table 2 shows the average responses (expressed in percentage) to elements being applicable or not applicable to the proposed audit.

**Table 2** Applicability of main elements

Audit Element	Applicable (%)	Not Applicable (%)
Organisation and Administration	100	0
Human Resources	74	26
Accommodation and Environment	85	15
Equipment	100	0
Measurement and Testing	100	0
Risk Assessments (Specific Services)	89	11
Occupational Hygiene Surveys	93	7
Documentation	100	0
Subcontracting	84	16
Suppliers	78	22
Non-conformances	72	28

Respondents had to also rate (in percentage) the sub elements as being applicable or not-applicable to the proposed audit for Approved Inspection Authorities for occupational hygiene. In the category “Applicable”, the sub elements listed in **ANNEXURE E** had ratings of between 68% and 100%. The lowest rating of 68% was allocated to the sub element “Investigation and Reporting” under the element: Non-conformances. Subsequently, this sub element had the highest rating of 32% under the category “Not Applicable”. The comprehensive list of element and sub element ratings is shown in **ANNEXURE E**.

Four of the 26 respondents suggested that the following main elements should be excluded from the occupational hygiene audit proposed for Approved Inspection Authorities:

- Suppliers
- Accommodation & Environment

No reasons were provided for the exclusion of the above two elements from the list of audit elements. One respondent indicated that the main element “sub contractors” was not applicable to an Approved Inspection Authority audit.

### 3.2.2 Response to Efficiency of Audits

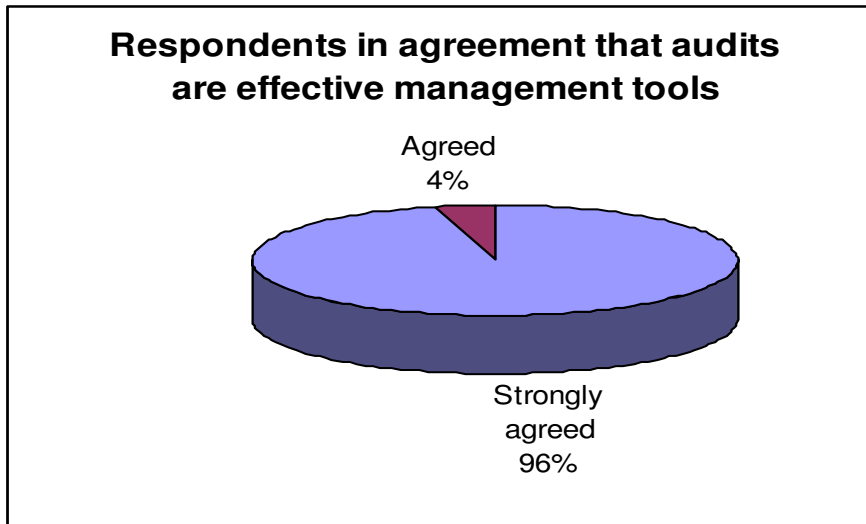
Table 3 represents the responses to the efficiency of audits in the identification of poor quality of work and corrective measures.

**Table 3** Summary of responses on efficiency of audits

<b>Respondent Classification</b>	<b>Sample size</b>	<b>Number of responses</b>	<b>Percentage</b>
Strongly agreed	26	22	84.6
Agreed	26	4	15.4

### 3.2.3 Response to the use of Audits as Management Tools

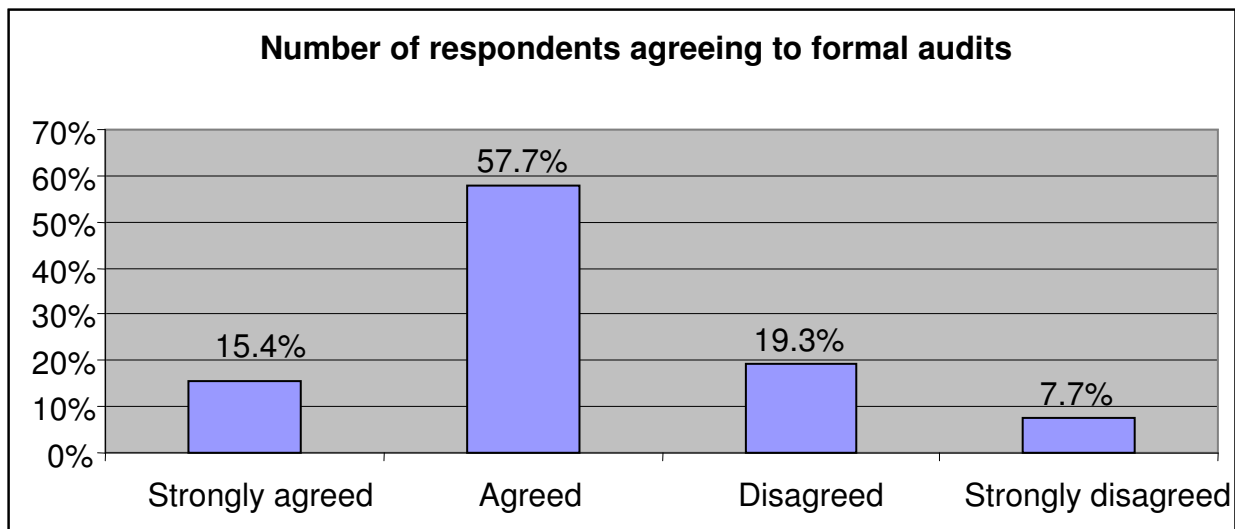
Ninety six percent of the respondents *strongly agreed* that audits are effective management tools to determine an Approved Inspection Authority's state of compliance with certain standards and guidelines, compared to the almost four percent of the respondents that *agreed*. The responses are shown in Figure 1.



**Figure 1** Summary of respondents in agreement that audits are effective management tools

### 3.2.4 Response to the need for Formal Audits

Four of the respondents *strongly agreed* that Approved Inspection Authorities for occupational hygiene require a formal audit to measure operational compliance. Fifty seven percent of the respondents *agreed* to the statement whereas 19% *disagreed*. Almost eight percent of the respondents *strongly disagreed*. The responses are shown in Figure 2.



**Figure 2** Percentage of respondents agreeing to formal audits

### 3.3 ADDITIONAL AUDIT ELEMENTS

#### 3.3.1 Recommended Additional Audit Elements

Six of the 26 respondents proposed additional elements that should be included in the audit proposed for Approved Inspection Authorities for occupational hygiene. The elements recommended could be summarized as the following:

- ISO 9000 Quality Management System
- Integrated Health (or Hygiene) and Occupational Safety
- Gravimetric Weighing, Analytical Facility and Analysis

The researcher included the recommended additional audit elements in the proposed audit tool attached as **ANNEXURE F**.

## **3.4 SCORING**

### **3.4.1 Responses to the Suggested Scoring Mechanism**

Respondents were asked to agree or disagree to the use of the suggested four model answers as is currently used by the majority of occupational hygiene member companies, CONCAWE Industrial Hygiene Subgroup (Brussels) for Occupational Health Auditing, as a scoring mechanism in the proposed auditing of Approved Inspection Authorities for occupational hygiene. The respondents also had the option to recommend an alternative scoring mechanism.

Forty two percent of the respondents “agreed” to the use of the suggested four point answers for the purpose of the proposed audit of Approved Inspection Authorities for occupational hygiene. Six or 23% of the respondents stated that they would use or apply a different scoring mechanism. However, they did not elaborate on the scoring mechanism they recommended.

Two respondents recommended the use of a five point scale (numbers: 1 - 5) for the auditing of Approved Inspection Authorities for occupational hygiene. Two of the respondents also recommended the use of the terms “comply” and “not comply” in the proposed audit instead of the use of numerical values.

Five respondents did not complete the section on the suggested scoring mechanism. No reason was given for not responding.

### 3.4.2 Responses to the Adequate Scores

The respondents were asked to choose a score (in percentage) which they regarded as an adequate achievement for an Approved Inspection Authority for occupational hygiene during an audit (Refer to Table 4).

Forty six percent of the respondents stated that a score of 50% would be adequate. Twenty three percent of the respondents indicated that a score of not less than 80% would be sufficient as compared to 19% of the respondents that stated that a score of not less than 90% would be required. Eleven percent of the respondents did not complete the section on “adequate scores”.

**Table 4** Number of responses and preferred audit scores for Approved Inspection Authorities for occupational hygiene

Number of respondents	Adequate Score out of 100 Percent
12	50
6	> 80
5	> 90
3	No response

### 3.4.3 Scores Warranting Corrective Actions

Respondents were also requested to choose a score which they regarded as warranting corrective action from a professional body or regulatory authority such as the DoL. Table 5 shows the responses. In summary, ten of the respondents indicated that a score of less than 80% warranted corrective action.

Twelve respondents indicated that a score in-between 50 – 60% warranted corrective action to be taken as opposed to one respondent who indicated that a score below 40% warranted remedial action. Three of the respondents did not complete the section on “Scores warranting corrective action”.

**Table 5** Number of respondents and scores warranting corrective action

Number of respondents	Score out of 100 Percent
10	< 80
7	< 60
1	55
4	< 50
1	< 40
3	No response

### 3.4.4 Corrective Actions

Respondents were also asked to choose from a list of possible corrective actions. Some respondents chose more than one option. The possible corrective actions included, *Probation Period*, *Fine*, *Forfeit AIA Status* and *Other*. The responses are shown in Table 6.

**Table 6** Corrective actions and number of responses

Corrective Action	Sample size	Number of responses	Percentage
Probation Period	26	4	15.4
Fine	26	20	76.9
Forfeit AIA Status	26	2	7.7
Other	26	3	11.5

### 3.4.5 General Comments

The last section of the questionnaire gave respondents the opportunity to provide any additional comments on the topic of audits for Approved Inspection Authorities for occupational hygiene. Nine respondents listed additional comments which may be summarized as follows:

3.4.5.1 One of the respondents stated that the SAIOH should be the only organization that coordinates the auditing of Approved Inspection Authorities for occupational hygiene.

- 3.4.5.2 Two of the respondents stated that the DoL should be the regulatory body responsible for auditing of Approved Inspection Authorities for occupational hygiene.
- 3.4.5.3 Four of the respondents commented that clients should not be allowed to audit Approved Inspection Authorities for occupational hygiene.
- 3.4.5.4 Two of the respondents stated that only selected services of the Approved Inspection Authority for occupational hygiene should be subjected to a formal audit. They did however not specify these services.
- 3.4.5.5 Four of the respondents commented that the “auditing” of Approved Inspection Authorities should be done through “surprise visits”.
- 3.4.5.6 Two of the respondents commented that occupational hygienists need to be absorbed into an advisory capacity for organizations such as the South African National Accreditation Scheme (SANAS) especially if Approved Inspection Authorities for occupational hygiene are to be formally audited.

## **CHAPTER 4            DISCUSSION**

### **4.1            RESEARCH DATA**

No formal audits currently exist for Approved Inspection Authorities for occupational hygiene once they are approved by the DoL. To rectify this deficiency this study was undertaken to gather opinions on the nature of a formal audit tool. Study questionnaires were emailed to 40 Approved Inspection Authorities for occupational hygiene, all of which are based in the Gauteng Province. The objective was to identify critical elements that should be included in a formal audit of the activities and operations of Approved Inspection Authorities for occupational hygiene, as well as to select a scoring mechanism for this purpose and to subsequently develop an audit tool that could be proposed for auditing an Approved Inspection Authority for occupational hygiene.

This study identified a number of elements that are currently associated with existing audits and which may be applicable and effective in the auditing of operational activities of Approved Inspection Authorities for occupational hygiene taking into account the current approval requirements set for Approved Inspection Authorities by the DoL as well as audit elements recommended for occupational health organizations delivering an “occupational hygiene” related service.

The study is also aimed to select an appropriate scoring mechanism to be used to score the operational activities of Approved Inspection Authorities for occupational hygiene.

The study does not aim to establish the frequency and logistics of the audit. It does however recommend that the audit be conducted after approval has been granted by DoL (that is approval as an Inspection Authority) and after the Approved Inspection Authority has been operational for a period of time.

Basic auditing steps are also recommended and are inline with steps listed in the existing audits researched for the purpose of this study. In summary the research aims to establish the scope of the audit through means of applicable and effective “audit elements”. The research acknowledges the fact that other aspects such as scheduling of audits, specific arrangements prior to the audit and background information may also be important as well as gathering of audit evidence from i.e. internal reports, policies & procedures, organizational charts, description of operations and even related statistics.

The information gathered during this study led to a tentative tool for further development of a formal audit tool (Refer to **ANNEXURE F**) and in no instance represents the view of all Approved Inspection Authorities for occupational hygiene.

## **4.2 LIMITATIONS**

### **4.2.1 General Limitations**

According to the records of the DoL the majority of Approved Inspection Authorities for occupational hygiene are based in the Gauteng Province. The study therefore focused on the Gauteng Province because the majority of Approved inspection Authorities for occupational hygiene is registered in this province. Several Approved Inspection Authorities for occupational hygiene is based in other provinces such as Mpumalanga and the coastal regions. Because the study aimed to sample the province with the most registered Approved Inspection Authorities for occupational hygiene it may be regarded a limitation as the views of other Approved Inspection Authorities for occupational hygiene based outside the Gauteng Province was not included in this study.

Due to financial constraints of the researcher only Approved Inspection Authorities for occupational hygiene in the Gauteng Province were included in this study which may also be considered a limitation.

The study therefore does not claim to represent the view of all Approved Inspection Authorities for occupational hygiene.

#### **4.2.2 Incomplete Response Rate**

Out of the sample population of 40 Approved Inspection Authorities for occupational hygiene, only 26 of the questionnaires were returned. The response rate may be attributed to time constraints on the side of the respondents which in itself may be regarded a limitation to the study, especially since the majority of Approved Inspection Authorities for occupational hygiene which were included in the sample population are privately owned consultancy based organizations, working on hourly rates and costing mechanisms.

#### **4.2.3 Lack of Existing Formal Audit System**

The lack of an existing formal system for the auditing of operational activities of Approved Inspection Authorities for occupational hygiene once approved by the DoL and the reluctance of some Approved Inspection Authorities to the change over from merely meeting once-off approval criteria to formal scoring against specific audit elements and sub elements may also be regarded a limitation to the study.

The lack of existing audits for Approved Inspection Authorities for occupational hygiene further resulted in limited literature being available on this topic.

#### **4.2.4 Sampling Method**

The sampling method applied in this study to gather data may also be regarded a limitation. Other techniques such as the *Delphi Technique* which is the reliable and creative exploration of ideas or the production of suitable information for decision making, may have delivered more refined data in this type of descriptive research. Delphi applications represent a useful communication device among a group of experts and thus facilitate the formation of a group judgment<sup>(12)</sup>.

### **4.3 AUDIT ELEMENTS**

Considering the findings of the study, respondents identified the following elements as applicable to an audit for Approved Inspection Authorities for occupational hygiene in South Africa:

- Organization, Administration and Human Resources
- Accommodation and Environment
- Equipment, Measurement and Testing
- Occupational Hygiene Services
- Documentation
- Non conformances

The said elements identified as applicable to the study also corresponded with those elements recommended by the SASOM in their Guideline for Occupational Health Audits - occupational medicine and occupational hygiene.

The elements identified in this study as applicable are also very similar to the elements in South African Standards such as the ISO 17020, 1998: General Criteria for the Operation of Various Types of Bodies Performing Inspection, as well as the ISO 17025, 1999: General Requirements for the Competence of Testing and Calibration Laboratories, both published by the South African Bureau of Standards, Pretoria.

Although no reason was given for the exclusion, four of the respondents did indicate the elements “Suppliers” and “Accommodation” as well as its sub elements should be excluded from the list of elements proposed in this study for the auditing of Approved Inspection Authorities for occupational hygiene.

The elements as well as a comprehensive list of the sub-elements identified in this study as applicable to the auditing of an Approved Inspection Authority for occupational hygiene is tabulated in **ANNEXURE F** as a draft audit tool.

Although it may not be regarded as representing the view of all Approved Inspection Authorities for occupational hygiene in all the provinces, the draft audit tool may be used as an “interim” tool or guideline for other Approved Inspection Authorities to respond or to initiate further research.

#### **4.4. EFFICIENCY & EFFECTIVENESS OF FORMAL AUDITS**

Respondents were also asked to “agree” or “strongly agree” or “disagree” or “strongly disagree” that audits are efficient in the identification of poor quality of work and the need for corrective measures or mitigation measures to ensure that occupational hygiene work is of a specific quality.

From the results of the study it was identified that almost 85% of the respondents strongly agreed that audits are efficient tools for the identification of poor work performance and sub standard quality practices. This finding links with the 96% of respondents who strongly agreed that audits are effective management tools used to determine an Approved Inspection Authority’s state of compliance with certain standards or guidelines.

#### **4.5 NEED FOR FORMAL AUDITS**

According to Corn, M. & Lees, P.S: 1983 <sup>(13)</sup>, industrial or occupational hygiene audits are frequently used and are a valuable tool for the safety specialist, but it has been infrequently used by the hygienist which further emphasis the need for auditing of operational activities of Approved Inspection Authorities for occupational hygiene.

Formal auditing of the operational activities of Approved Inspection Authorities for occupational hygiene may be necessary since the international trend is to audit occupational health and safety management systems, quality systems, as well as environmental management systems and programs.

This study found that more than 80% of the respondents did agree that audits were an effective means to identify work quality (Refer to Table 3). More than 90% of the respondents strongly agreed that audits are effective management tools to determine an Approved Inspection Authority's state of compliance with certain standards and guidelines, compared to the almost 4% of the respondents that agreed with this statement. According to Guild. R., Ehrlich. I. R., et. al in their Handbook of Occupational Health Practice in the South African Mining Industry, Occupational Health Management and audits are used as a key management tool in assessing the strengths and weaknesses of management systems for occupational health <sup>(14)</sup>.

Compliance audits largely focus on non conformance to legislation or standards and procedures. Auditing of a management system however, evaluates not only the elements and sub elements of the management system but also how well expectations have been communicated throughout the organization, how well they are understood and the level to which they are actually implemented <sup>(15)</sup>.

Regulatory requirements are becoming increasingly complex and the penalties for non-compliance can be significant. Boards of directors may face liability for poor health performance and need some process to demonstrate that they have been diligent in exercising their responsibilities, often in operations that they do not know intimately.

## **4.6 SCORING**

### **4.6.1 Suggested Scoring Mechanism**

A scoring system which used four model answers as is currently applied by the majority of occupational hygiene member companies of the CONCAWE, Industrial Hygiene Subgroup (Brussels) for Occupational Health Auditing were suggested as a scoring mechanism for the proposed audit for Approved Inspection Authorities for occupational hygiene. Forty two percent of the respondents did agree to the use of this scoring mechanism in the proposed audit for Approved Inspection Authorities for occupational hygiene and did not recommend any other scoring mechanism.

Other scoring mechanisms which were recommended by the remaining respondents included the use of a five point scale (numbers 1 – 5) or the use of the terms “comply” and “not comply” to show compliance with a specific audit element or sub element. The use of five point scale values is common in many types of audits used throughout the South African industry. A four-point scale forces a decision, while a five-point scale provides the possibility of a neutral answer <sup>(16)</sup>.

Use of terminology such as “comply” and “not comply” is widely used by tertiary institutions or training service providers to express successful or unsuccessful completion of outcomes based training courses.

#### **4.6.2 Body to perform the Audit**

The majority of respondents stated that the DoL should perform the proposed audit on the Approved Inspection Authorities for occupational hygiene. According to Mr. Sibisi, Directorate: Health and Hygiene (within the Department of Labour), auditing of Approved Inspection Authorities should remain with the Department of Labour as the Department set the policies and legislation governing Approved Inspection Authorities. Several respondents stated that their response was supported by the fact that the DoL regulates occupational hygiene in South Africa and because the DoL is responsible for the registration of Approved Inspection Authorities for occupational hygiene.

Five respondents stated that the SAIOH should be the body that performs the proposed audit on the Approved Inspection Authorities for occupational hygiene. No reason was given to support the response.

Although not listed as a response, the DoL may be regarded the preferred body to perform the proposed audit on Approved Inspection Authorities for occupational hygiene. This statement may be supported by the fact that the DoL sets the legislation to which Approved Inspection Authorities must adhere, and also the fact that the DoL is not managed or coordinated by any Approved Inspection Authorities for occupational hygiene or their members. The DoL may therefore be in a position to objectively and without any bias perform audits on Approved Inspection Authorities for occupational hygiene. This may not be said for an organization such as the SAIOH as it is comprised of, and completely managed by members from Approved Inspection Authorities for occupational hygiene.

### **4.6.3 Audit Scores Warranting Corrective Actions**

Ten respondents stated that scores less than 80% would warrant corrective action as oppose to the seven respondents that indicated that corrective action was only warranted at scores of less than 60%. One respondent indicated that a score of 55% warranted corrective action. Four respondents stated that corrective action was required at a score of less than 50%. Only one respondent stated that action was necessary at a score of less than 40%. Three respondents did not complete the section on scores warranting corrective action. No reason was given for not completing this section.

It therefore seems that the majority of respondents preferred of Approved Inspection Authorities for occupational hygiene to achieve higher scores in the proposed audit in order not to be subjected to some means of corrective action from the DoL or the SAIOH.

The achievement of high audit scores may also be supported by the fact that highly specialized monitoring and testing equipment are used in the occupational hygiene fieldwork, in most instances with detailed sampling or monitoring strategies, hand in hand with analytical methods requiring a good understanding of the principles of occupational hygiene and its instrumentation.

#### 4.6.4 Type of Corrective Action

According to the majority of responses (almost 77%), corrective action should be some sort of “fine” imposed on the Approved Inspection Authority for occupational hygiene for not meeting the minimum score (in an audit). The smallest number of respondents stated that Approved Inspection Authorities for occupational hygiene that did not achieve the minimum audit score should forfeit their Approved Inspection Authority status. The fact that only a small number of respondents selected the said option as appropriate corrective action may be supported by the fact that forfeiting of the organizations’ status as an Approved Inspection Authority for occupational hygiene could lead to the organization not rendering any monitoring or measurement services which could lead to its closure, with subsequent job losses.

As a general comment, some respondents stated that Approved Inspection Authorities for occupational hygiene which do not meet the minimum score should be given a form of *improvement notice*. The respondents did however not define the minimum score at which such a notice must be given.

The respondents did however state that the notice should require the Approved Inspection Authority for occupational hygiene to effect improvements within a period of i.e. 6 or 12 months after which the operational activities of the Approved Inspection Authority for occupational hygiene must be subjected to a re-evaluation or audit to measure the actual level of improvement.

In the case of an improvement notice, Approved Inspection Authorities for occupational hygiene would have to implement corrective actions which could include, amongst others, support, coaching or mentorship from other Approved Inspection Authorities for occupational hygiene who holds significantly higher audit scores.

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**5.1 NEED FOR FORMAL AUDITS**

Growth in industrial and mining sectors expanding to meet the demands of a growing nation results in increased risk of exposure to workplace hazards which further justifies the appointment and approval of Approved Inspection Authorities for occupational hygiene. Many management and business decisions and compensation claims are affected by occupational hygiene survey and assessment results produced by Approved Inspection Authorities for occupational hygiene and therefore the need for formal and structured auditing of the operational activities of such Approved Inspection Authorities.

From this study it may be concluded that Approved Inspection Authorities for occupational hygiene must maintain professional registration and continued professional development and also that they agree that they should be subjected to some form of a formal audit or evaluation to ensure that aspects such as fieldwork, data interpretation and report compilation is done with accuracy and traceability which should be measured from time to time.

It may further be concluded that a formal audit is necessary to ensure that occupational hygiene services are delivered in compliance with the original approval criteria set by the DoL.

It is also concluded that operational activities of the Approved Inspection Authorities for occupational hygiene should be audited in accordance with specific elements inline with common quality, health and safety management systems to ensure verification and traceability.

The majority of questionnaire responses supported auditing of Approved Inspection Authorities for occupational hygiene by a form of non-profit professional body or regulatory authority such as the DoL in order to prevent favoritism and any such discrepancies especially since the majority of the Approved Inspection Authorities for occupational hygiene is consultancy based organizations in a market that can be seen as very competitive.

The organization responsible for the administration of the audits should make available resources and guidelines to assist Approved Inspection Authorities for occupational hygiene to reach and maintain adequate scores in their audits, and to assist the Approved Inspection Authorities in the event when not achieving the desired score. The same organization should also make resources available specifically “coaching” and “training” – in the event that specific scores are not met, before resorting to more stringent or direct corrective actions. Alternatively this role could be played by the relevant professional body, i.e. SAIOH to separate policing from support functions.

## 5.2 GENERAL RECOMMENDATIONS

- The SAIOH should schedule workshops with its members to draft a formal audit tool based on the audit elements and sub elements suggested in this study (Refer to **ANNEXURE E**) that can be presented to the DoL for approval.
- The draft audit tool (Refer to **ANNEXURE F**) should be made available to all Approved Inspection Authorities for occupational hygiene, whatever the stressor the Inspection Authority may be approved for.
- The DoL, the SAIOH and representatives from the Approved Inspection Authorities should meet to investigate the need for the “formal” auditing of the operational activities of Approved Inspection Authorities for occupational hygiene.
- Approved Inspection Authorities for occupational hygiene under the coordination of the DoL and even a professional body such as SANAS should be given the opportunity to set audit criteria such as audit intervals or frequencies, scores and corrective actions, etc.
- Approved Inspection Authorities for occupational hygiene must be trained and educated on the necessity of a formal audit specifically once approval has been granted by the DoL to ensure compliance with the original approval criteria set by the DoL.

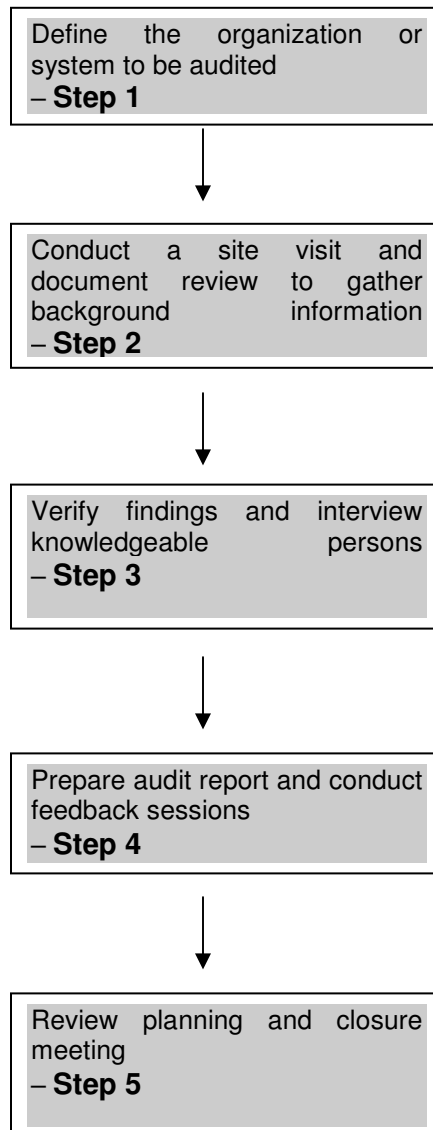
- In South Africa, occupational hygiene audits should be such that it is relevant as a mechanism to ensure verification, traceability and general conformity to accepted practices, methodologies and legislation amongst all Approved Inspection Authorities for occupational hygiene.
- Apart from scoring results, all data and subsequent documentation from audits administered to Approved Inspection Authorities for occupational hygiene must be kept confidential.

### **5.3 RECOMMENDED AUDIT STEPS**

Any audit need to include specific audit activities. The extent to which the provisions of audit activities are applicable depends on the scope and complexity of the specific audit and the intended use of the audit conclusions. Most audits commences with an opening meeting during which the audit team can discuss items that may need further clarification. The meeting discussions should also provide a cursory overview of the intended scope, time frame, progress report, meeting frequency, payment schedule, format of draft and final report and method of delivery <sup>(17)</sup>. In the case of an audit for Approved Inspection Authorities for occupational hygiene, audit conclusions as one of the audit steps can primarily be used to rate or score the degree of verification and traceability that exists within the day to day operational activities of the Approved Inspection Authority as well as general compliance with methodologies, legislation and other relevant standards which must be complied with such as the SANS Code of Practice - 17025: 1999 which sets the general requirements for the competency of testing and calibration laboratories.

Although the purpose of this study is not to research and develop the audit *steps or specific process*, auditing steps are listed in Table 7 as a means to provide an overview of the common steps to be followed during a typical audit.

**Table 7** Recommended occupational hygiene auditing steps



## 5.4 AUDIT COST

Several safety and health management systems (SHMS) are being implemented every year by various organizations due to regulatory compliance pressure, increased safety and health performance requirements, supplier and customer preferences as well as stakeholder expectations. Typically, the eventual performance results (or outcomes) of safety and health management systems are not standardized and are of a qualitative rather than a quantitative nature <sup>(18)</sup>. Therefore the more reason for the auditing of not only health and safety management systems but specifically also Approved Inspection Authorities for occupational hygiene. However, implementing audits for Approved Inspection Authorities for occupational hygiene may have a cost implication. Audits are expensive and care needs to be taken to ensure value for money when initiating the audit process.

The costs of an audit are determined by amongst others time spent by the auditor on preparing, performing and completing the audit. Overheads such as traveling and accommodation may also contribute to costs associated with auditing of operational activities <sup>(18)</sup>. Cost may therefore be a very important factor specifically since many of the Approved Inspection Authorities for occupational hygiene in South Africa are fairly small organizations, commonly comprising out of two or three individuals. Smaller Approved Inspection Authorities for occupational hygiene may not have the financial means to pay for formal or follow-up audits. However, costs could be kept to a minimum by fixing audit frequencies and scopes, i.e. a mandatory laboratory or equipment audit once every three years.

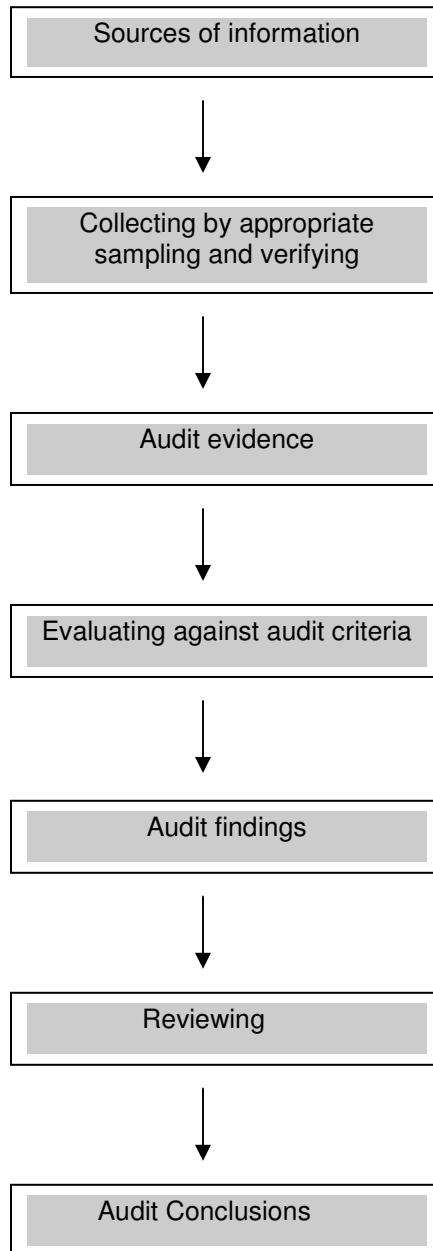
## 5.5 AUDIT EVIDENCE

During occupational health, safety and environmental audits it is extremely important to audit correct and appropriate information. Therefore, during the audit, information relevant to the audit objectives, scope and criteria, including information relating to the interfaces between functions, activities and processes, should be verified. Only information that is verifiable may be audit evidence <sup>(18)</sup>. Audit evidence is evidence which an auditor is to obtain during his auditing stages and record in its auditing working papers <sup>(18)</sup>. This process should therefore be very similar for the auditing of Approved inspection Authorities for occupational hygiene mainly due to the nature of the scientific work performed by an Approved Inspection Authority for occupational hygiene as well as the high degree of verification and traceability required in its work as is required by the SANS Code of Practice - 17025: 1999; General Requirements for the Competence of Testing and Calibration Laboratories.

After the review of audit evidence, compliance with a specific audit element or sub element can be determined by audit “actual scores” evaluated against possible “total scores” to provide a qualitative score that can be expressed as a percentage as is suggested in the audit score summary <sup>(19)</sup> (Refer to **ANNEXURE G**). The *audit score summary* is developed as a summary of the elements suggested by the respondents to the research project. Some of the suggested elements are similar to elements suggested by in the audit summary developed by SHE Link CC – Approved Inspection Authority for Occupational Hygiene specifically for the summarizing of scores derived from their audit for Occupational Health and Safety Legal Compliance purposes <sup>(20)</sup>.

Table 8 shows an overview of the process from collecting information to reaching audit conclusions.

**Table 8** Process from collecting information to reaching audit conclusions



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## ANNEXURE A

UNIQUE IDENTIFICATION NUMBER :	(To be completed by the researcher)
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Dear Respondent,

### **Audit System for Occupational Hygiene Approved Inspection Authorities in South Africa**

I am a third year post graduate student with the University of the Witwatersrand. I am enrolled for a master's degree in Public Health (MPH), specializing in the field of Occupational Hygiene. As part of my research project I am developing an audit system for Occupational Hygiene Approved Inspection Authorities (AIA's) in South Africa. I have developed a list of suggested elements that may be necessary for such an audit. Please go through the suggested list as well as the statement covering each of the tabled elements. For each element, please tick the block to indicate "applicable" or "not applicable". The **purpose** is to eliminate the elements that may not be necessary to include in an effective audit system for Approved Inspection Authorities, but to include those that are crucial.

Please mail the completed questionnaires back to me. All information will be treated as **confidential**. A summary of the study will be mailed back to you upon completion of the entire study. Please note that this study has been given the go ahead by both the Ethics Committee of the University of the Witwatersrand (Reference Number: R14/49 Bosch), as well as the Certification Board of the South African Institute for Occupational Hygiene (CB – SAIOH). Should you not complete this questionnaire, please be so kind to supply the reason for doing so as it is important for research purposes.

Thank you for your time and assistance.

Conrad Bosch

MPH Student

University of the Witwatersrand

## ANNEXURE B

### Questionnaire Instructions:

Please tick/mark one (1) block per element: **Applicable** or **Not Applicable**. Next to each element is a statement to assist you in forming an idea about the relevance or necessity of each element. Please view it as a guideline to assist you in judging the applicability of the element in the proposed audit system.

### PROPOSED AUDIT ELEMENTS

No.	Element	Statement	Applicable	Not Applicable
<b>1.</b>	<b>ORGANISATION AND ADMINISTRATION</b>			
1.1	Organisation and Administration	The element of Organisation and Administration is a critical component in an audit system		
1.2	Quality Policy	An Approved Inspection Authority should have a quality policy		
1.3	Quality Management System	A quality management system is necessary to ensure quality within the operational activities of an Approved Inspection Authority		
1.4	Organizational Structure	An Approved Inspection Authority should have a clear organizational structure		
1.5	Responsibilities	Responsibilities within an Approved Inspection Authority should be clearly defined		
1.6	Signatories	Specific persons should be authorised as signatories		
1.7	Legal Registrations	Persons employed by the Approved Inspection Authority should be registered with certain professional bodies		

No.	Element	Statement	Applicable	Not Applicable
<b>2. HUMAN RESOURCES</b>				
2.1	Human Resources	AIA's cannot operate without the human resources		
2.2	Training and Experience	Training and experience is important in the operation of an Approved Inspection Authority		
2.3	Staff Development	Should staff of an AIA be developed on a continual basis?		
2.4	Employee recognition and Performance Measurement	Is it necessary to recognise employee contributions and should employee performance be measurable?		
2.5	Human Resource Planning	The human resource requirements of an Approved Inspection Authority should be planned		
<b>3. ACCOMMODATION AND ENVIRONMENT</b>				
3.1	Accommodation and Environment	Approved Inspection Authorities should have some sort of accommodation in a specific or definable environment		
3.2	Administrative Offices	Approved Inspection Authorities require an administrative office/facility or area		
3.3	General Laboratories	Approved Inspection Authorities make use of subcontracting laboratories		
3.4	Weighing Rooms	There are specific requirements for gravimetric weighing rooms?		

No.	Element	Statement	Applicable	Not Applicable
<b>4.</b>	<b>EQUIPMENT</b>			
4.1	Equipment	Approved Inspection Authorities need equipment and instrumentation to conduct their work		
4.2	Calibration	Equipment must be subjected to internal/external calibration?		
4.3	Maintenance	Planned maintenance a requirement		
<b>5.</b>	<b>MEASUREMENT AND TESTING</b>			
5.1	Methods and Techniques	Specific methods and techniques should be followed for measuring or testing		
5.2	Traceability	Results must be traceable		
5.3	Sampling	Sampling is performed by AIA's		
5.4	Sample Receiving/Recording	A procedure for the receiving/handling of samples a requirement		
5.5	Records and Documentation	Record keeping is a necessity		
5.6	Field Blanks	Field blanks must be handled in a specific manner		
<b>6.</b>	<b>OCCUPATIONAL HYGIENE SERVICES</b>			
6.1	Health Risk Assessments	HRA's should have a specific format		
6.2	Hazard Identification Risk Assessments	HIRA's should have a specific format		
6.3	Noise Surveys	Calibrated equipment should be used to perform noise surveys		
6.4	Illumination Surveys	Calibrated equipment should be used to perform illumination surveys		
6.5	Ventilation Surveys	Ventilation measurements should be conducted with the use of specific equipment		

No.	Element	Statement	Applicable	Not Applicable
<b>6.</b>	<b>OCCUPATIONAL HYGIENE SERVICES (Continued)</b>			
6.6	Thermal Stress Surveys	Not any person can perform a thermal stress survey		
6.7	Ergonomics Surveys	A specific methodology must be followed for the execution of ergonomic surveys		
6.8	Hazardous Biological Agents Surveys	Specific methods must be used for the sampling of hazardous biological substances		
6.9	Hazardous Chemical Substances Surveys	Specific methods must be used for the sampling of hazardous chemical substances		
6.10	Noise Surveys	Calibrated equipment should be used to perform noise surveys		
6.11	Stack Emission Surveys	Stack emission surveys must be conducted by a competent person		
6.12	Fallout Dust Surveys	Fallout dust monitoring should be conducted in accordance with a specific method		
6.13	Verifications	Verifications of reports and surveys should be conducted in accordance with specific legal requirements		
6.14	Other Services	AIA's may perform other services		
<b>7.</b>	<b>DOCUMENTATION</b>			
7.1	Documentation	Specific documentation must be kept by the AIA's		
7.2	Reference Material	Specific reference material must be kept		
7.3	Client Records	All field documents to be kept		
7.4	Noise Surveys	Calibrated equipment should be used to perform noise surveys		

No.	Element	Statement	Applicable	Not Applicable
<b>7.</b>	<b>DOCUMENTATION (Continued)</b>			
7.5	Document Control	Documentation must be controlled		
7.6	Confidentiality	All records, kept confidential		
<b>8.</b>	<b>SUBCONTRACTING</b>			
8.1	Subcontracting	AIA's may subcontract		
8.2	Quality Management System	Subcontractors should have a quality management system		
8.3	Document Control	Documents used by subcontractors should be controlled		
8.4	Confidentiality	Subcontractors must ensure confidentiality of i.e. records		
8.5	Complaints	Subcontractors must have a system in place for the handling of complaints		
<b>9.</b>	<b>SUPPLIERS</b>			
9.1	Suppliers	AIA's purchase from suppliers		
9.2	Registration and Verification	Suppliers must be registered/ verified with specific organizations		
9.3	Quality Management System	Suppliers require a quality management system		
9.4	Document Control	Suppliers should control documentation		
9.5	After Sales Service	Suppliers require a policy on after sales services		

No.	Element	Statement	Applicable	Not Applicable
<b>10.</b>	<b>NON-CONFORMANCES</b>			
10.1	Complaints and non-conformances	An AIA should have a policy on complaints and non-conformances		
10.2	Corrective Measures	The AIA should take corrective actions in the event of incorrect actions or omissions		
10.3	Investigation and Reporting	The AIA should have procedures in place to decide on which actions or omissions to be investigated		

Is your organization an Approved Inspection Authority for Occupational Hygiene?

Yes	No
-----	----

(Tick/mark one)

Is your organization approved for all the Occupational Hygiene stressors? If not list the stressors that your organization is approved for (if any):

For each of the following statements, check/tick one under: *Strongly disagree, Disagree, Agree, Strongly agree.*

#	Item	Strongly Disagree	Disagree	Agree	Strongly Agree
1	Audits are effective in the identification of poor quality work and corrective measures				
2	Audit are an effective measurement tool to determine an Approved Inspection Authority's state of compliance with certain standards and guidelines				
3	Occupational Hygiene Approved Inspection Authorities require a formal audit in order to measure operational compliance				
4	Occupational Hygiene Approved Inspection Authorities should be formerly audited as part of a quality system				
5	The proposed elements (listed in the tables above) are adequate for Occupational Hygiene approved inspection authorities				

Please list other elements that you might like to add to the audit:

Why would you like to add the element/s listed above?

Who (organization or person) should conduct such an audit:

Why should the above-mentioned organisation/person conduct the audit?

## SCORING

Scoring an Approved Inspection Authority's administrative and operational activities in my research will be conducted in accordance with the four model answers used by most of the Industrial Hygiene Subgroup, Brussels Occupational Health Auditing and specifically occupational member companies (CONCAWE). The four-point scale is used because it forces a decision, while a five-point scale provides for the possibility of a neutral answer.

According to the mentioned scoring scale, answers may include:

- Score 0: Immediate action needed
- Score 1: Major deficiencies
- Score 2: Minor deficiencies
- Score 3: Fully compliant

Do you agree or disagree to the use of the suggested scoring mechanism or would you recommend any other method of scoring?

Please tick the audit score you regard as adequate:

40 – 50%	
70 – 80%	
81 – 90%	
91 an up	
Other?	

What do you see as an unsatisfactory score?

10 – 30%	
31 – 40%	
41 – 50%	
51 – 60%	
Other?	

What actions should be taken against Approved Inspection Authorities that does not achieve the minimum score, you can also suggest what the minimum score should be:

Probation Period	
Fine	
Forfeit AIA Status	
Other?	

Would you recommend a minimum score.....%

Any suggestions, improvements or comments for this audit system?

--

# ANNEXURE C

## UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Division of the Deputy Registrar (Research)

### HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

R14/49 Bosch

#### CLEARANCE CERTIFICATE

PROTOCOL NUMBER M040103

#### PROJECT

An audit system for regulatory authorities & professional bodies to assess operational competence of occupational hygiene approved inspection authorities



#### INVESTIGATORS

Mr C Bosch

#### DEPARTMENT

Sch of Public Health

#### DATE CONSIDERED

30:01:04

#### DECISION OF THE COMMITTEE\*

Approved unconditionally

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

DATE 04.02.26

CHAIRPERSON   
(Professor PE Cleaton-Jones)

\*Guidelines for written 'informed consent' attached where applicable

cc: Supervisor : Mrs A Spies

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#### DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and ONE COPY returned to the Secretary at Room 10005, 10th Floor, Senate House, University.

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. I agree to a completion of a yearly progress report.

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

## **ANNEXURE D**

### **AUDIT LIST**

#### **REQUIREMENTS FOR APPROVED INSPECTION AUTHORITY APPROVAL**

- **THE APPLICATION IS TO LIST:**

- Name of personnel with responsibilities of each;
- Name of other Approved Inspection Authorities affiliated with or of which will be made use of for certain functions such as analytical laboratories, occupational medical practitioners.
- Qualifications and Experience.
- Equipment (Ownership, where kept/installed, calibration authorities).
- Documentation:
  - (1. Reference literature: Manuals Codes).
  - (2. Description of how reports will be compiled, made known).
- Occupational health stressors to be monitored.
- Contact details.
- Limitations.
- Restrictions to parastatals, local authorities and Government Departments.

#### **AN APPROVED INSPECTION AUTHORITY AUDIT REPORT**

- **TECHNICAL PERFORMANCE**

- \* Understanding of legal requirements applicable to the client's of the undertaken.
- \* Standard of the prepared reports.
- \* Application of legal requirements, standards and codes of practice.
- \* Ability to identify occupational health stressors.
- \* Ability to formulate an opinion on the degree of risk present in the work place.
- \* Ability to resolve occupational health problems.

- \* Ability to recommend control measures.
- \* Ability to write accurately and concisely on technical matters.
- **STANDARD OF FILES**
  - \* Layout and content of permanent file.
  - \* Layout and content of current file.
  - \* Proper indexing and cross-referencing.
  - \* Clarity of information and evidence of work done.
  - \* Specification of applicable codes and reference manuals used.
  - \* Neatness.
- **ORGANISATION**
  - \* Ability to arrange priorities.
  - \* Ability to tie up loose ends and produce finished result on time.
  - \* Keeping others informed of progress.
- **SUPERVISION**
  - \* Delegating and supervising to get detail work done.
  - \* Competence in reviewing and dealing with queries.
- **PUBLIC (CLIENT) RELATIONS AND DEVELOPMENT SERVICES**
  - \* Ability to work with and obtain co-operation of client and client's staff.
  - \* Initiative in ensuring client satisfaction.
- **PERSONAL AND PROFESSIONAL DEVELOPMENT**
  - \* Conscientiousness and enthusiasm.
  - \* Acceptance of guidance, correction and criticism.

## ANNEXURE E

### Applicable Sub Elements:

The table below shows the number of respondents that rated the applicability (expressed in percentage) of sub elements proposed in this audit:

No.	Element	Statement	Applicable	Not Applicable
			%	%
<b>1.</b>	<b>ORGANISATION AND ADMINISTRATION</b>			
1.1	Organization and Administration	The element of Organization and Administration is a critical component in an audit system	100	0
1.2	Quality Policy	An Approved Inspection Authority should have a quality policy	92	8
1.3	Quality Management System	A quality management system is necessary to ensure quality within the operational activities of an Approved Inspection Authority	100	0
1.4	Organizational Structure	An Approved Inspection Authority should have a clear organizational structure	94	6
1.5	Responsibilities	Responsibilities within an Approved Inspection Authority should be clearly defined	94	6
1.6	Signatories	Specific persons should be authorized as signatories	79	21
1.7	Legal Registrations	Persons employed by the Approved Inspection Authority should be registered with certain professional bodies	82	18

No.	Element	Statement	Applicable	Not Applicable
			%	%
<b>2.</b>	<b>HUMAN RESOURCES</b>			
2.1	Human Resources	AIA's cannot operate without the human resources	74	26
2.2	Training and Experience	Training and experience is important in the operation of an Approved Inspection Authority	83	17
2.3	Staff Development	Should staff of an AIA be developed on a continual basis?	82	18
2.4	Employee recognition and Performance Measurement	Is it necessary to recognize employee contributions and should employee performance be measurable?	77	23
2.5	Human Resource Planning	The human resource requirements of an Approved Inspection Authority should be planned	76	24
<b>3.</b>	<b>ACCOMMODATION AND ENVIRONMENT</b>			
3.1	Accommodation and Environment	Approved Inspection Authorities should have some sort of accommodation in a specific or definable environment	90	10
3.2	Administrative Offices	Approved Inspection Authorities require an administrative office/facility or area	98	2
3.3	General Laboratories	Approved Inspection Authorities make use of subcontracting laboratories	70	30
3.4	Weighing Rooms	There are specific requirements for gravimetric weighing rooms?	89	11

No.	Element	Statement	Applicable	Not Applicable
			%	%
<b>4.</b>	<b>EQUIPMENT</b>			
4.1	Equipment	Approved Inspection Authorities need equipment and instrumentation to conduct their work	100	0
4.2	Calibration	Equipment must be subjected to internal/external calibration?	99	1
4.3	Maintenance	Planned maintenance a requirement	97	3
<b>5.</b>	<b>MEASUREMENT AND TESTING</b>			
5.1	Methods and Techniques	Specific methods and techniques should be followed for measuring or testing	100	0
5.2	Traceability	Results must be traceable	100	0
5.3	Sampling	Sampling is performed by AIA's	100	0
5.4	Sample Receiving/Recording	A procedure for the receiving/handling of samples a requirement	100	0
5.5	Records and Documentation	Record keeping is a necessity	100	0
5.6	Field Blanks	Field blanks must be handled in a specific manner	98	2
<b>6.</b>	<b>OCCUPATIONAL HYGIENE SERVICES</b>			
6.1	Health Risk Assessments	HRA's should have a specific format	89	11
6.2	Hazard Identification Risk Assessments	HIRA's should have a specific format	90	10
6.3	Noise Surveys	Calibrated equipment should be used to perform noise surveys	100	0
6.4	Illumination Surveys	Calibrated equipment should be used to perform illumination surveys	93	7
6.5	Ventilation Surveys	Ventilation measurements should be conducted with the use of specific equipment	90	10

No.	Element	Statement	Applicable	Not Applicable
			%	%
<b>6.</b>	<b>OCCUPATIONAL HYGIENE SERVICES (Continued)</b>			
6.6	Thermal Stress Surveys	Not any person can perform a thermal stress survey	80	20
6.7	Ergonomics Surveys	A specific methodology must be followed for the execution of ergonomic surveys	82	18
6.8	Hazardous Biological Agents Surveys	Specific methods must be used for the sampling of hazardous biological substances	100	0
6.9	Hazardous Chemical Substances Surveys	Specific methods must be used for the sampling of hazardous chemical substances	100	0
6.10	Noise Surveys	Calibrated equipment should be used to perform noise surveys	100	0
6.11	Stack Emission Surveys	Stack emission surveys must be conducted by a competent person	92	8
6.12	Fallout Dust Surveys	Fallout dust monitoring should be conducted in accordance with a specific method	92	8
6.13	Verifications	Verifications of reports and surveys should be conducted in accordance with specific legal requirements	90	10
6.14	Other Services	AIA's may perform other services	92	8
<b>7.</b>	<b>DOCUMENTATION</b>			
7.1	Documentation	Specific documentation must be kept by the AIA's	100	0
7.2	Reference Material	Specific reference material must be kept	96	4
7.3	Client Records	All field documents to be kept	96	4

No.	Element	Statement	Applicable	Not Applicable
			%	%
<b>7.</b>	<b>DOCUMENTATION (Continued)</b>			
7.4	Document Control	Documentation must be controlled	96	4
7.5	Confidentiality	All records, must be kept confidential	88	12
<b>8.</b>	<b>SUBCONTRACTING</b>			
8.1	Subcontracting	AIA's may subcontract	96	4
8.2	Quality Management System	Subcontractors should have a quality management system	89	11
8.3	Document Control	Documents used by subcontractors should be controlled	88	12
8.4	Confidentiality	Subcontractors must ensure confidentiality of i.e. records	90	10
8.5	Complaints	Subcontractors must have a system in place for the handling of complaints	78	22
<b>9.</b>	<b>SUPPLIERS</b>			
9.1	Suppliers	AIA's purchase from suppliers	90	10
9.2	Registration and Verification	Suppliers must be registered/ verified with specific organizations	70	30
9.3	Quality Management System	Suppliers require a quality management system	73	17
9.4	Document Control	Suppliers should control documentation	68	32
9.5	After Sales Service	Suppliers require a policy on after sales services	82	18

No.	Element	Statement	Applicable	Not Applicable
			%	%
<b>10.</b>	<b>NON-CONFORMANCES</b>			
10.1	Complaints and non-conformances	An AIA should have a policy on complaints and non-conformances	72	28
10.2	Corrective Measures	The AIA should take corrective actions in the event of incorrect actions or omissions	91	9
10.3	Investigation and Reporting	The AIA should have procedures in place to decide on which actions or omissions to be investigated	68	32

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## ANNEXURE F

### Audit Tool:

The following audit tool is tabled from elements identified by respondents as necessary to be included in an audit for Approved Inspection Authorities for occupational hygiene:

#### AUDIT ELEMENTS & SCORING

No.	Element	Statement	Scoring			
			0	1	2	3
<b>1.</b>	<b>ORGANISATION AND ADMINISTRATION</b>					
1.1	Organization and Administration	Is the AIA organized and administered in such a way that it can perform its technical functions satisfactorily?				
1.2	Quality Policy	Does the AIA have a quality policy?				
1.3	Quality Management System	Does the AIA have a quality management system to ensure quality within the operational activities of the AIA?				
1.4	Organizational Structure	Does the AIA have a clear organizational structure?				
1.5	Responsibilities	Responsibilities within an Approved Inspection Authority should be clearly defined?				
1.6	Signatories	Are specific persons authorized as signatories?				
1.7	Legal Registrations	Are the persons employed by the Approved Inspection Authority registered with the appropriate professional bodies, e.g. SAIOH, HPCSA?				
<b>1.</b>	<b>TOTAL:</b>					

No.	Element	Statement	Scoring			
			0	1	2	3
<b>2.</b>	<b>HUMAN RESOURCES</b>					
2.1	Human Resources	Does the AIA have an appropriate number of personnel to perform its technical functions satisfactorily?				
2.2	Training and Experience	Is the personnel trained and experienced?				
2.3	Staff Development	Is the staff of the AIA developed on a continual basis?				
2.4	Employee recognition & Performance Measurement	Is the employee contributions recognized & is employee performance measurable?				
2.5	Human Resource Planning	Is the human resource requirements of the AIA planned?				
<b>2.</b>	<b>TOTAL:</b>					
<b>3.</b>	<b>ACCOMMODATION AND ENVIRONMENT</b>					
3.1	Accommodation and Environment	Does the AIA have some sort of accommodation in a specific or definable environment?				
3.2	Administrative Offices	Does the AIA require an administrative office/facility or area?				
3.3	General Laboratories	Does the AIA make use of subcontracting laboratories?				
3.4	Weighing Rooms	Is the specific requirements for gravimetric weighing rooms adhered to?				
<b>3.</b>	<b>TOTAL:</b>					

No.	Element	Statement	Scoring			
			0	1	2	3
<b>4.</b>	<b>EQUIPMENT</b>					
4.1	Equipment	Does the AIA need specialized/technical equipment & instrumentation to conduct its work?				
4.2	Calibration	Equipment must be subjected to internal/external calibration?				
4.3	Maintenance	Is planned equipment and instrumentation maintenance a requirement?				
<b>4.</b>	<b>TOTAL:</b>					
<b>5.</b>	<b>MEASUREMENT AND TESTING</b>					
5.1	Methods and Techniques	Should specific methods and techniques be followed for measuring or testing?				
5.2	Traceability	Are results traceable?				
5.3	Sampling	Is sampling performed by the AIA?				
5.4	Sample Receiving/Recording	Does the AIA have a procedure for the receiving/handling of samples?				
5.5	Records and Documentation	Is record keeping performed?				
5.6	Field Blanks	Are field blanks handled in accordance with accepted practices?				
<b>5.</b>	<b>TOTAL:</b>					

No.	Element	Statement	Scoring			
			0	1	2	3
<b>6.</b>	<b>OCCUPATIONAL HYGIENE SERVICES</b>					
6.1	Health Risk Assessments (HRA's)	Does the HRA's have a specific format?				
6.2	Hazard Identification	Does the HIRA's have a specific format?				
6.3	Noise Surveys	Is calibrated equipment used to perform noise surveys?				
6.4	Illumination Surveys	Is calibrated equipment used to perform illumination surveys?				
6.5	Ventilation Surveys	Is the ventilation measurements performed with the use of specific equipment?				
6.6	Thermal Stress Surveys	Is thermal stress surveys performed with calibrated equipment?				
6.7	Ergonomics Surveys	Is a specific and appropriate methodology followed for the execution of ergonomic surveys?				
6.8	Hazardous Biological Agents Surveys	Is specific methods used for the sampling of hazardous biological substances?				
6.9	Hazardous Chemical Substances Surveys	Is specific methods used for sampling of hazardous chemical substances?				
6.10	Noise Surveys	Is calibrated equipment used to perform noise surveys?				
6.11	Stack Emission Surveys	Is stack emission surveys performed by a competent person?				
6.12	Fallout Dust Surveys	Is dust monitoring performed in accordance with a specific method?				

No.	Element	Statement	Scoring			
			0	1	2	3
<b>6.</b>	<b>OCCUPATIONAL HYGIENE SERVICES (Continued)</b>					
6.13	Verifications	Are verifications of reports and surveys done as per legal requirements?				
6.14	Other Services	Does the AIA perform other services?				
<b>6.</b>	<b>TOTAL:</b>					
<b>7.</b>	<b>DOCUMENTATION</b>					
7.1	Documentation	Is relevant/ specific documentation kept by the AIA?				
7.2	Reference Material	Is specific reference material kept?				
7.3	Client Records	Are all field documents/notes kept?				
7.4	Noise Surveys	Are measurement locations shown on noise plans?				
7.5	Document Control	Are documentation controlled?				
7.6	Confidentiality	Are all records kept confidential?				
<b>7.</b>	<b>TOTAL:</b>					

No.	Element	Statement	Scoring			
			0	1	2	3
<b>8.</b>	<b>SUBCONTRACTING</b>					
8.1	Subcontracting	Is the AIA subcontracting any of its services?				
8.2	Quality Management System	Do the subcontractors have a quality management system?				
8.3	Document Control	Are the documents used by the subcontractors controlled?				
8.4	Confidentiality	Do the subcontractors ensure confidentiality of i.e. records?				
8.5	Complaints	Do the subcontractors have a system in place for the handling of complaints?				
<b>8.</b>	<b>TOTAL:</b>					
<b>9.</b>	<b>SUPPLIERS</b>					
9.1	Suppliers	Do the AIA purchase from suppliers?				
9.2	Registration and Verification	Area the suppliers registered with any organizations?				
9.3	Quality Management System	Do the suppliers have a quality management system?				
9.4	Document Control	Do the suppliers control its documents?				
9.5	After Sales Service	Do the suppliers have a policy on after sales services?				
<b>9.</b>	<b>TOTAL:</b>					

No.	Element	Statement	Scoring			
			0	1	2	3
<b>10.</b>	<b>NON-CONFORMANCES</b>					
10.1	Complaints and non-conformances	Does the AIA have a policy on complaints & non-conformances?				
10.2	Corrective Measures	Does the AIA take corrective actions when necessary?				
10.3	Investigation and Reporting	Does the AIA have procedures in place to decide on which actions or omissions to be investigated?				
<b>10.</b>	<b>TOTAL:</b>					

## ANNEXURE G

### Audit Score Summary:

The following scoring summary is tabled from elements identified by respondents as necessary to be included in an audit for Approved Inspection Authorities for occupational hygiene:

#### AUDIT SCORE – SUMMARY:

No.	ELEMENT	SCORE
<b>Audit Elements:</b>		<b>Possible Total</b>
1.	Organization & Administration	----- 27
2.	Human Resources	----- 15
3.	Accommodation & Environment	----- 12
4.	Equipment	----- 9
5.	Measurement & Testing	----- 18
6.	Occupational Hygiene Services	----- 42
7.	Documentation	----- 18
8.	Subcontracting	----- 15
9.	Suppliers	----- 15
10.	Non-conformances	----- 9
<b>Average Compliance (in percentage):</b>		