Workplace Health Without Borders
Imagine a world where everyone goes home at least as healthy as when they came to work.
There are 3 billion workers in the world...

Source:
World Health Organization (WHO)
There are 3 billion workers in the world...

Nearly 2 billion of them work in unhealthy and unsafe conditions

Source: World Health Organization (WHO)
More people die each year from occupational injuries and disease than from other major causes.

- Armed Conflict and Violence: 0.742
- Road traffic: 1.24
- HIV/AIDS: 1.6
- Occupational injuries and disease: 2.34

Millions of Deaths per Year Worldwide
More people die from occupational disease than accidents at work
160 million workers get sick each year due to non-fatal workplace-related diseases

Source: International Labor Organization (ILO) 2013
160 million workers get sick each year due to non-fatal workplace-related diseases

Source: International Labor Organization (ILO) 2013
Occupational injuries, sickness, and disease costs the world economy $2.8 trillion/year

Source: International Labor Organization (ILO) 2013
Hazardous working conditions affect whole families, including children

Amina's baby is playing in the family compound where the lead level was measured at 23,000 parts per million.
168 million of the world’s children are child labourers, more than half of whom work in hazardous conditions: ILO
In some places every day is take your kid to work day
H&S constraints in developing countries

- Funding
- Expertise
- Resource
- Supplies
- Maintenance
Occupational Hygienists have the knowledge and skills to find solutions
Occupational hygienists are certified/registered in only 12 countries. We would need 55,000 more hygienists to match the level of service in these countries.
Workplace Health Without Borders (WHWB)

- A non-profit international organization
- Registered as a charity in Canada
Workplace Health Without Borders (WHWB)

- Engages volunteers to address workplace health issues around the world
Vision

A world where workers do not get sick because of their work
Mission

To engage the occupational health professions in ensuring that workers and employers throughout the world have the knowledge and technical means to prevent work-related disease
Global Reach

- Network of 400+ people around the world
- Monthly teleconferences for information exchange
Sponsored a workshop in Odisha, India to address silica exposure among stone crushers.
Partnering with University of Toronto and People’s Training and Research Centre in India on Grand Challenges project:
WHWB - Agate Silica Exposure

- Design of low cost engineering controls
- WHWB and University of Toronto
  - Use locally available materials

<table>
<thead>
<tr>
<th>Quartz mg.m(^{-3})</th>
<th>Before</th>
<th>After</th>
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<tr>
<td></td>
<td>3</td>
<td>0.05</td>
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Brick plant project - addressing silica and other hazards in brick plants in Nepal, Pakistan and Tanzania
Provided technical assistance on sampling for silica in Pakistan brick plants
We are working with the ILO Child Labour Project to help protect the many children around the world who work in brick plants.
Mentor Programme

Connecting professionals across the globe
Workplace Health Without Borders
Occupational Health for Workers Everywhere

OH Learning

The Occupational Hygiene Training Association (OHTA) is a not-for-profit organisation of volunteers. We aim to reduce the global burden of ill health from the work environment by promoting better standards of occupational hygiene practice around the world.
Training Programmes

Occupational hygiene course for physicians in India
Training Programmes

OHTA W201
Basic Principles in Occupational Hygiene, Tanzania
Facilitated OH equipment donations to Uruguay, Pakistan, Tanzania
Information sessions at every monthly teleconference
Round Tables and presentations on global OH at professional conferences
Join our growing international membership!
Respirable Crystalline Silica
An Introduction

A Workplace Health Without Borders UK
Online Course

Terry McDonald             WHWB-UK
23rd January 2019
Workplace Health Without Borders

• WHWB is a non-profit organisation dedicated to ensuring healthy working conditions for workers everywhere.

• WHWB-UK is the UK branch of the international organisation.
Workplace Health Without Borders

- Provides training programmes
- Provides mentoring programmes
- Promotes professional and public awareness
- Supports international NGOs
- Carries out specific projects
The RCS Course

• The course is designed to provide basic information on respirable crystalline silica.

• It is aimed at health and safety professionals, managers and others who may be concerned about exposure to RCS in the occupational environment.

• It is not aimed at occupational hygienists.
The RCS Course

• To ensure that the course is accessible to the widest audience:
  – It is designed for online delivery to make it freely accessible to the widest audience.
  – Technical terminology is avoided to aid understanding.
Course Aims

• To provide a basic understanding of:
  – What is Respirable Crystalline Silica (RCS)
  – The common sources of RCS in workplaces
  – The health effects of RCS exposure
  – The basic approaches to assessing risk associated with RCS exposure
  – Practicable means of controlling exposure
Background History

• The course was based upon the content of a foundational level course originally developed for OHTA.
The Online Course

Respirable Crystalline Silica - An Introduction

- Workplace Health Without Borders
  1. Course Introduction
  2. What is Respirable Crystalline Silica?
  3. Health Effects of Exposure
  4. Common Sources of Exposure
  5. Risk Assessment
  6. Control
  7. Course Summary
  Further Information Sources

www.terrymcdonald.net/SilicaCourse2a

Terry McDonald               WHWB-UK
23rd January 2019
Course Contents

• A discussion of what is respirable crystalline silica (RCS)
• An overview of the health effects of exposure to RCS
• Common sources of exposure
• Basic approaches to risk assessment
• Methods for controlling exposure
Organisation

• Each page covers a specific area
• The course user can work their way through the course in any order and at their own rate
• Pages can be revisited at any time
Page Contents

• A presentation covering the specific topic area
• A summary of the key points of the specific topic area
• Self assessment questions
Respirable Crystalline Silica - An Introduction

Workplace Health Without Borders

1. Course Introduction
2. What is Respirable Crystalline Silica?
3. Health Effects of Exposure
4. Common Sources of Exposure
5. Risk Assessment
6. Control
7. Course Summary

Further Information Sources

What is Respirable Crystalline Silica Presentation

Click on the link below to view the “What is Respirable Silica” presentation.

What is Respirable Crystalline Silica? (New Window)

Key Points

Respirable crystalline silica (RCS) is a form of the mineral silica. Silica is formed of the two most abundant elements in the earth’s crust: silicon and oxygen. Each silica molecule consists of one atom of silicon and two of oxygen giving a chemical formula of SiO2.

Naturally occurring silica can exist in two forms:
- Amorphous

In the amorphous state the silica molecules form a random pattern rather than being in an ordered state. The amorphous form of silica is quite rare in nature. An example of naturally occurring amorphous silica is diatomaceous earth.
- Crystalline

In the crystalline state the silica molecules form a three dimensional repeating pattern. The crystalline state of silica is the most common form in nature.

The second most common naturally occurring mineral is crystalline silica in the form of quartz. Other less common forms include tridymite, cristobalite and semi-precious and gem stones such as agate and opal.

Crystalline silica is found in every type of rock with igneous (volcanic) rocks such as granite containing up to one third quartz, sedimentary rocks such as sandstone up to 60% quartz, and sand and silt up to 95% quartz.

This course is about crystalline silica in its respirable form. Respirable crystalline silica (RCS) is the type of crystalline silica dust that is of the most importance when assessing the risk to the health of exposed workers.

Respirable dust consists of very small particles of dust that can penetrate into the deep parts of the lung. This deep part of the lung is called the alveolar region and is where the blood takes the oxygen from the air we breathe. These particles are less than ten millionths of a metre (10μm – ten microns) in diameter. This is less than one seventh the diameter of a human hair.
3. Health Effects of Exposure

Health Effects Key Points

When very fine particles of RCS are breathed in they penetrate deep into the alveoli region of the lung where they are trapped. Here they can cause a number of different serious diseases.
PPT Presentations / Videos?

• Currently the embedded presentations are as PowerPoint presentation files

A Simple Exposure Model

• In the final version these are to be replaced by videos
Key Points

Respirable crystalline silica (RCS) is a form of the mineral silica. Silica is formed of the two most abundant elements in the earth’s crust; silicon and oxygen. Each silica molecule consists of one atom of silicon and two of oxygen giving a chemical formula of SiO₂.

Naturally occurring silica can exist in two forms:

- Amorphous
  In the amorphous state the silica molecules form a random pattern rather than being in an ordered state. The amorphous form of silica is quite rare in nature. An example of naturally occurring amorphous silica is diatomaceous earth.

- Crystalline
  In the crystalline state the silica molecules form a three dimensional repeating pattern. The crystalline state of silica is the most common form in nature.

The second most common naturally occurring mineral is crystalline silica in the form of quartz. Other less common forms include tridymite, cristobalite and semi-precious and gem stones such as agate and opal.

Crystalline silica is found in every type of rock with igneous (volcanic) rocks such as granite containing up to one third quartz, sedimentary rocks such as sandstone up to 80% quartz, and sand and silt up to 95% quartz.

This course is about crystalline silica in its’ respirable form. Respirable crystalline silica (RCS) is the type of crystalline silica dust that is of the most importance when assessing the risk to the health of exposed workers.

Respirable dust consists of very small particles of dust that can penetrate into the deep parts of the lung. This deep part of the lung is called the alveolar region and is where the blood takes the oxygen from the air we breathe. These particles are less than ten millionths of a metre (10μm – ten microns) in diameter. This is less than one seventh the diameter of a human hair.
Navigation

- A clickable index in the left-hand column
- Clickable forward and back arrows on each page.

6. Control

Control of Exposure Presentation

Click on the link below to view the Control of Exposure presentation.

Control of Exposure Key Points

The nature of the health effects of exposure to RCS mean that exposure should be controlled to a low a level as possible and always below the OEL. With any given workplace there are always a range of possible control measures that could be used. The risk assessment should be used to help to decide what control methods will be best for the workplace being investigated. The choice of control methods to be used should be based upon application of the control hierarchy; the cost

Terry McDonald			WHWB-UK
23rd January 2019
Presentation of Information

• Simple visual presentation of information is used when possible

What Does 0.1 mg/m³ Look Like?

Approximately 8mg of dust in a standard 40 foot “hi cube” shipping container
Self Assessment

• Each section has self assessment questions to enable the course participant to test their understanding of the subject.
• These are set up to provide feedback and guidance if the wrong answer is selected.
Self Assessment

¿Select the correct answer for each of the following questions.

What are the two elements that make up silica?
- Hydrogen and Oxygen
- Iron and Silicon
- Silicon and Oxygen
- Hydrogen and Silicon

The most common naturally occurring form of crystalline silica is?
- Quartz
- Cristobalite
- Tridymite
- Kaolinite

Individual respirable particles are:
- Half the width of a human hair
- Less than 10 millionths of a meter in diameter
- Visible with the naked eye.
- Not able to penetrate into the alveolar region of the lung.
Self Assessment

Fill in the missing words.

Read the paragraph below and fill in the missing words.

A local exhaust ventilation (LEV) system consists of a ______ that draws the contaminated air into a ______ and through ______ to take it away from the worker.

Submit

Is this true?

Decide if the following statement is true or false.

A simple dust mask will provide adequate protection from RCS exposure in most cases.

- True  - False

File Attachments
Continuing Development

• How can you help?
  – Providing constructive feedback on course content / layout
  – Providing additional content
  – The presentations require voice-overs before converting them to video format
Contact

• Temporary website address
  – www.terrymcdonald.net/SilicaCourse2a

• Email address
  – terry@terrymcdonald.net
WHWB – Mentoring the Future

David M. Zalk, PhD, CIH

With Assistance From:
MARGUERITE PILGER, CIH, ROH (CANADA)
DOROTHY COOK LFOH (UK)
HANS THORE SMEDBOLD (NORWAY)
JACKIE MORTON, PhD (UK)
THE GLOBAL CHALLENGE

- Around the world there are 2.8 billion workers
- 10 – 15% worker access to basic occupational health services
- 2.5 billion workers do not have ability to reduce occupational risks

How are workers protected?
THE GLOBAL CHALLENGE

- 35 million new cases of work related illness each year due to exposure to chemicals\(^1\)
- 2.4 million lives per year lost to occupational disease\(^2\)

Total 44,000 NAR occupational hygienists\(^3\) required

BUT

only 7,576 available – (6,506 in North America)\(^3\)

WHWB / OHTA / IOHA SYNERGY

IOHA 2016-20 Strategy Document; Fulfill IOHA’s Mission
2010 – 2017 cumulative data

7,351 exam candidates
852 courses (136 in 2017)
50 countries (25 in 2017)
WHWB MENTORING

• Who benefits?
  – People who have completed one or more of the OHTA modules in occupational hygiene;
  – People who are preparing to write certification examinations,
  – Mentoring is something we all can benefit from throughout our careers.
  – WHWB anticipates that both partners in the mentoring relationship will benefit. Both mentor & mentee learn from mentoring.
How Does It Work?

• WHWB receives requests for mentors in occupational hygiene.
• WHWB receives offers from senior hygienists to act as mentors.
• WHWB tries to match mentors and mentees who are in similar time zones, as feasible to make meeting scheduling easier.
• Do you think we receive more mentor offers or mentee requests?
HOW DO WE COMMUNICATE?

• Meet virtually (e.g. weekly by Skype or Zoom) and communicate by email.
• Demonstrate practical examples of equipment set-up on Skype/Zoom.
• Arrange to meet in person.

Possible Examples:
  – At a conference or
  – Visit to the mentee’s country or
  – Mentee visits mentor’s country
    • For a course, conference or for work.
1-to-1 Mentoring Success Examples

• Marguerite Pilger, ROH, CIH of WHWB mentoring a Mongolian student in Canada for an IH Master’s
  – Needed more practical experience, so they met weekly over Skype where equipment use was demonstrated
  – Planning a PhD on respiratory health of children in Mongolia
  – Mpho Motlhabane: “Very inspiring indeed the time, effort, interest and passion in mentoring demonstrated is really, really inspiring.”

• Chuck Pilger, CIH of WHWB mentoring a Uruguayan to further her professional IH experience via Zoom
  – She’s seeking to become a CIH and teach IH at her university
  – Gaining access to advanced knowledge anywhere in the world
  – Paula Viapiana: “I am convinced it was one of the most useful learning experiences I have ever had. I encourage everyone who wishes to develop as an occupational health professional to join the WHWB mentoring program. You will not regret it.”
Group Mentoring Potential

• **2002**: IOHA/ACGIH® Student Mentorship of 1st Occupational Hygiene class at University of Witswatersrand, South Africa
  – Matched a CIH field practitioner with each Master’s student
  – Communicated issues, assignments, and thesis topics via email
  – Occupational Health Department Library received ACGIH® package

• **2018**: Request for WHWB Mentors from National Institute for Occupational Health (NIOH) in South Africa for staff of 11 Occupational Hygienists to become better professionals
  – NIOH publications needed improvement for international utility
  – Varying levels of experience, from MPH to BSc to EHS Techs
  – Support needed for scientific writing, protocol development, statistics
  – Improving sampling strategies and exposure methodologies
  – Staff all registered with SAIOH, built through Wits Uni successes
  – Model can be replicated in other countries, successes transferred
Conclusions - Mentoring the Future

• Matching right mentee to mentor is important.
  – Ensure mentor expertise can help the mentee
• Mentor needs to bring out the best in mentee.
  – Mentee needs trust to maximize communications
• Right communication method, time and frequency.
  – Skype/Zoom practice improves video communications
• **Become a Mentor!**
  ✓ Must have qualification recognised to senior Occupational Hygienist level in their respective country.
  ✓ How to volunteer to be a mentor:
    http://www.whwb.org/mentoring/
Working in Africa – Some Practical Considerations, Observations and Opportunities

By Dr Dave Rogers MBA CIH CFFOH CEnv
Woodglade Consultants Ltd
Overview

• Introduction
• Practical Considerations
• Observations
• Opportunities
• Summary / Conclusions
Introduction

• Chartered occupational hygienist and independent consultant, providing clients with HSE and strategic workplace management services.

• Projects in most parts of Africa for a range of clients (e.g. due diligence audits for multinational corporations, HSE manager for the construction of the largest dry-cooled coal-fired power station in the world, and more recently HSE management verification audits for private equity investment firms).

• Visiting Africa since 2000 and in last 7 years spent a couple of months there each year – international and well-resourced companies, which are associated with improving the key country infrastructures.
• Wide range of companies (e.g. upstream and downstream oil & gas, energy generation, telecommunications, satellite TV, food manufacture, agricultural chemicals manufacture, higher education)
• Private equity investment company – manages three funds at the moment, each valued at several billion USDs
• Contributors to these funds includes international funding agencies (e.g. World Bank through the IFC)
• Proviso for investment of these funds is that companies comply with the performance standards of the funding entities.
Introduction (cont.)

For example, there are 8 IFC performance standards:

- PS1: Assessment and Management of Environmental and Social Risks and Impacts
- PS2: Labor and Working Conditions
- PS3: Resource Efficiency and Pollution Prevention
- PS4: Community Health, Safety, and Security
- PS5: Land Acquisition and Involuntary Resettlement
- PS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources
- PS7: Indigenous Peoples
- PS8: Cultural Heritage

https://www.ifc.org/wps/wcm/connect/Topics_Ext_Content/IFC_External_Corporate_Site/Sustainability-At-IFC/Policies-Standards/Performance-Standards

- These PSs cover H&S, environment and sustainability, social and cultural aspects, labour and HR conditions, corporate governance and ABC

- All aspects have to be met by the companies that receive the funding, as a condition of investment
Practical Considerations

• **Language** – English-speaking and francophone countries

• **Nigeria** has more English speakers (79M) than the UK (59.6M)

• **Not everybody** is suited to travelling and working in African countries – stresses and strains associated with working in these countries

• e.g. attitude, lack of empathy, lack of flexibility or open mindedness, ability to cope, frustration levels with delays or change of arrangements; travel-related problems

• **Political instability**

• **ABC issues**
Practical Considerations (cont.)

• Travel Security

NEWS
Nairobi Dusit hotel under attack as blasts and gunfire heard

A hotel complex is under attack in the Kenyan capital, Nairobi.

At least two blasts and gunfire were heard at the compound in the Westland district of the city, which houses the Dusit hotel as well as offices.

The Somali-based militant group al-Shabaab claimed the attack but gave no details. Four armed men entered the complex, eyewitnesses say.
Practical Considerations (cont.)

• Host companies provide all local transport logistical support; also prepare formal security plans for our visit – based on the most recent information – subscribe to appropriate international security intelligence services

• HSE travel plan and risk assessment - access www.gov.uk to receive email travel updates for every country in the world for travel health and security aspects

• e.g. this year were considering going to DRC but alternative plans made due to recent elections and poor security situation in the country – updates from fco indicated not going to be any improvement in short-term
Practical Considerations (cont.)

• Travel health – injections, anti-malarials, food and drink, bottled water
• Travel documents e.g. visas, yellow fever health passport
Observations

- Getting to and from sites can be problematical due to natural causes. E.g. Cameroon – between Douala (main commercial city) and Yaoundé
Observations

• Entrepreneurial; microbusinesses
Observations (cont.)

• Travel to sites
Observations (cont.)

- Economic contrasts within countries e.g. Yamoussoukro – administrative capital 4 to 5 hour drive of the commercial centre Abidjan – Basilica of Our Lady of Peace – largest church in world (30,000 m² and 158 m high. Construction cost estimates vary between US$175 to 600 million).
Observations (cont.)

• Telecommunications sector has been a real enabler for communities across the continent.

• Most people in the major cities have smartphones, they have access to the internet.

• The entire telecoms infrastructure has been strengthened and made reliable in many countries. This has allowed people to get information, take online courses and increasingly allowing to extend their knowledge and training and, hence, their life options.
Opportunities

• **Growing middle class across the continent - 7 Dec. 2018 article**
  https://qz.com/africa/1486764/how-big-is-africas-middle-class/

(Africa’s consumer class definition based mainly upon asset ownership and educational levels – 330 million people; household spending has grown steadily to reach $1.6 trillion last year after crossing the USD$1 trillion mark in 2010. Household spending is projected to hit USD$2.5 trillion by 2025, according to estimates by McKinsey Global Institute.)
Opportunities (cont.)

• We use tools like Skype, facetime and other video calling web-based applications to hold face to face meetings, carry out training and also carry out mentoring of individuals.

• This allows a vehicle for growth and for occupational hygiene specifically e.g. WHWB mentoring; OHTA online courses and resources

• Carry out mentoring and assist with real time workplace monitoring activities through the use of WhatsApp and similar apps. - can result an improvement in the competency for whoever wishes to pursue a career in occupational hygiene.

• Real challenge is getting the practical occupational hygiene experience - WHWB is setting up programmes to getting equipment to individuals and also providing no/low cost analytical laboratory services.
Opportunities (cont.)

• WhatsApp in Tanzania for field crews in remote maintenance bases with weekly tool box talks and briefings and real time video communications to/from anywhere in the country (and indeed the world) - allows a behavioural HSE culture to be developed, maintained and advanced across the supply chain and across the geographical regions.

• Food manufacturing site in West Africa – noisy manufacturing area – quality officer had phone SLM app, had made noise measurements recently and was now looking at additional noise abatement measures – access to occupational hygiene apps would be useful for persons wanting to get into occupational hygiene
Summary / Conclusions

• Work in Africa has its challenges but is rewarding
• Occupational hygienists well-suited - tend to be focused on the person and the worker, rather than the monetary gains – what is required for working in countries across Africa – empathy, understanding, open-mindedness – all key traits
• Web technologies are real enablers for the development of emerging occupational hygiene professionals around the world
• Opportunities to support emerging professionals in Africa through web-based learning, video mentoring (e.g. to gain qualifications, to support fieldwork, ongoing professional development and support) and formal training activities
• Get involved with WHWB formally – financial donations, participating in teleconferences, etc.
Contact Details

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