



**Office of Safety, Health
and Environment**

Office of Safety, Health and Environment Annual Report 2013

The Office of Safety, Health and Environment (OSHE) is the corporate office in charge of workplace safety & health matters, environmental compliance and emergency management in NUS.

Our Vision

A safe and disaster resilient university where safety, health, environmental protection and emergency preparedness are embraced as core values.

Our Mission

Saving Lives, Preventing Injuries, Ensuring Business Continuity by transforming mindsets and facilitating the development and implementation of best practices

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Message by Director

Thank you for taking your time to read the Office of Safety, Health and Environment's annual report for 2013. The purpose of this report is to provide our stakeholders an overview of our programmes and services and how they have facilitated the University in achieving its safety, health, environmental compliance and emergency management milestones.

In 2013, due to the strong support of our senior management and departments, we achieved significant reductions in our accident and incident rates and raised safety compliance standards on campus. This was particularly challenging considering that the University is still growing, with a steady increase in research funding and student programmes.

We are particularly proud in having supported the University in achieving its re-accreditation to the Association for Assessment and Accreditation of Laboratory Animal Care (AAALAC) standards for animal facilities. We also ensured that the safety of NUS community during the construction of new buildings and regularization of existing ones.

We continue to work closely with regulators. For example, the Agri-Veterinary Authority (AVA) granted us an institutional licence for the possession of veterinary biologics and therefore individual researchers need not apply for their own permits. Regulators took greater interest in Institutes of Higher learning and in 2013, we therefore had inspections by Singapore Civil Defence Force (SCDF) and Occupational Safety and Health Division, Ministry of Manpower (MOM). We were commended for our good practices by both MOM and SCDF.

We have also contributed to raising safety standards in Singapore and internationally through the organization of conferences, participation in steering and advisory committees and hosting study visits by other Universities.

I hope you enjoy reading this report and look forward to hearing your comments and feedback.

Dr Peck Thian Guan
Director
Office of Safety, Health and Environment

1. EHS Functions and Responsibilities

Organizational Structure

Office of Safety, Health & Environment (OSHE) organizational structure –
Safety and Health Management Division and Emergency Management Division.

OSHE organization chart is shown in Figure 1. The department is organised as follows:

1. Directorate – Director and core support staff such as IT, Finance and Admin.
2. Safety and Health Management (SHM) Division – responsible for the development and delivery of programmes and services related to general workplace safety and health, biosafety, chemical safety, radiation safety, office safety, ergonomics and construction safety. The division is also the secretariat for the institutional safety and health committees. With the division there are different functional groups – (1) Microbiology and Biomedical Group (2) Engineering and Sciences Group (3) Infrastructure Group and (4) Management Systems Group.
3. Emergency Management (EM) Division – responsible for crisis and emergency management, business continuity planning, fire safety and field trip safety.

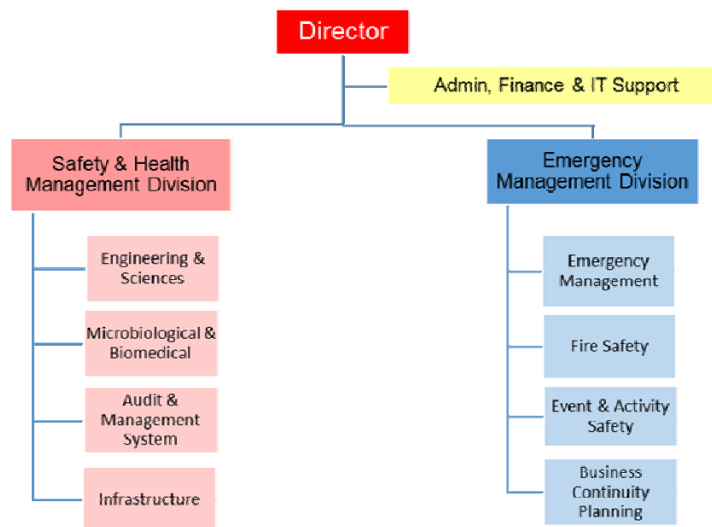


Figure 1- OSHE Organization chart

OSHE is positioned strategically within the University Administration to effectively deliver its programmes. OSHE reports to Vice President (Campus Infrastructure), who in turn reports to the NUS President.

NUS has adopted a structure where safety and health is represented across all levels of management (as shown in Figure 2).

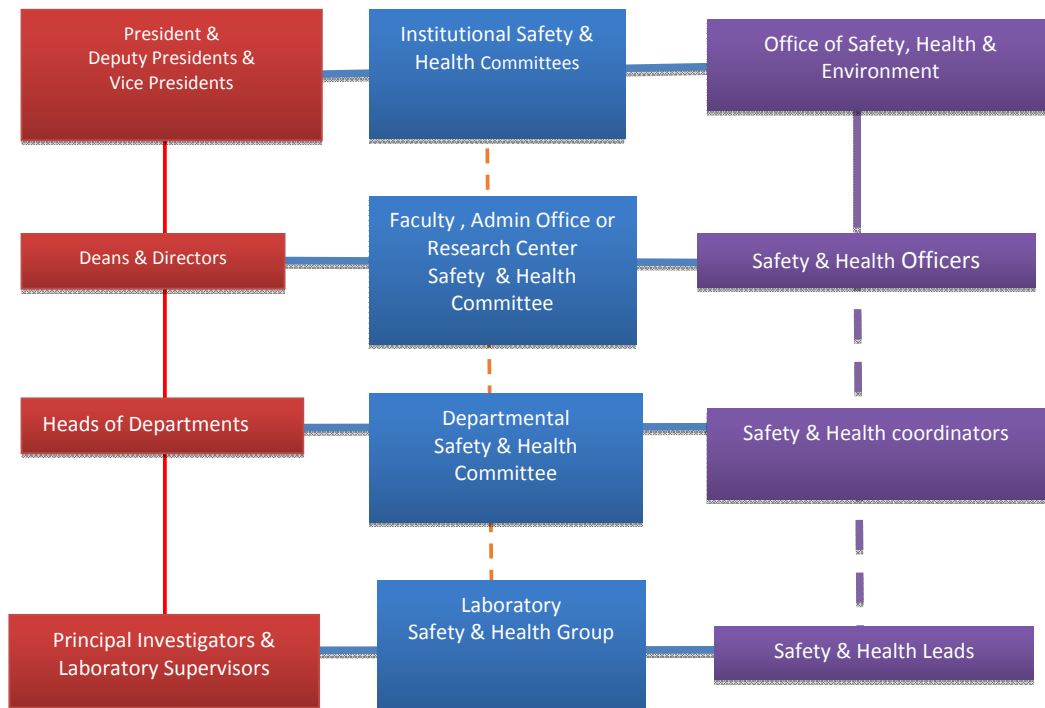


Figure 2 - Safety Organization at the National University of Singapore

University Safety & Health Committees

Institutional safety and health committees are responsible for providing strategic advice and endorsement of university-wide safety & health policies, OSHE's programmes and services.

The institutional safety and health committees of NUS are shown in shown in Table 1. These committees endorses university-wide safety & health policies, provide strategic advice to OSHE.

Institutional Committee	Chairman	Scope
1. Risk Management Steering Committee (RMSC)	Prof Tan Chorh Chuan NUS President	Monitoring the University's overall key risk indicators, which include safety and health compliance risk.
2. Institutional Biosafety Committee (IBC)	A/Prof Gan Yunn Hwen Assoc Professor, Biochemistry	Biosafety in Labs
3. Institutional Construction Safety Committee (ICSC)	Assoc Prof Florence Ling Vice Dean, School of Design and Environment	Construction safety
4. Institutional Laboratory Safety Committee (ILSC)	Prof Lim Seh Chun Deputy Dean Faculty of Engineering	Chemical safety, radiation safety and physical safety in labs

Table 1- Scope and responsibilities of the Institutional Safety and Health Committees

Safety & Health Management Division

The Safety & Health Management (SHM) Division facilitates the building of a positive safety, health and environmental culture and learning experience for all NUS staff and students through the development and adoption of SHE best practices and systems.

This is achieved through the implementation of a safety and health management system (SMS@NUS) in NUS Departments and Faculties. This system is based on international standards such as OHSAS 18001:2007 (Occupational health and safety management systems – Requirements) and CWA 15793:2008 (Laboratory Biorisk Management Standard).

Due to the diverse nature of activities on campus and their associated hazards and risks, OSHE had developed appropriate polices, a variety of manuals and diverse programmes to ensure the range of hazards that are found in the university are effectively managed. This is illustrated in Figure 3.

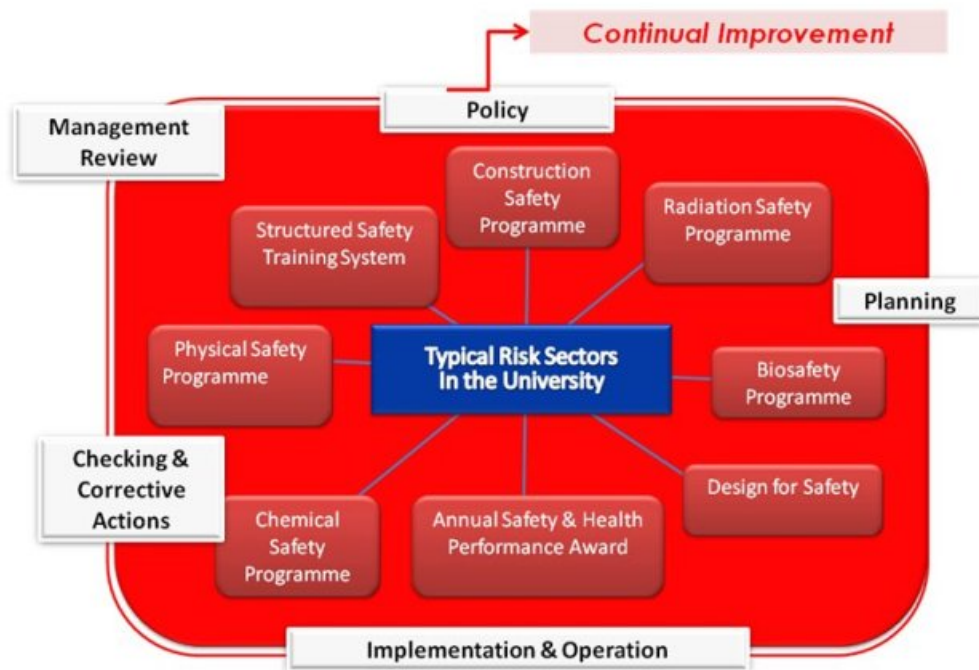


Figure 3- Safety and Health Management System

Emergency Management Division

The main function of Emergency Management (EM) Division is to equip NUS staff and students with the knowledge and tools so that they can efficiently and effectively plan, prepare, organise and execute their events and activities in a safe manner, to manage emergency and crisis situations expeditiously and to ensure business continuity after a major incident.

The EM Division imparts knowledge and facilitates departments, staff and student groups in emergency preparedness, life and fire safety. Staff from EM Division work closely with staff and students, senior management, administrative offices, faculties and colleges, halls and residences, student clubs and societies. They provide advisory, consultation, training, policies and guidelines, supervision, audits and inspections at both strategic and operational levels.

The EM Division ensures that NUS is prepared for and is able to response well to incidents, emergency or crisis situations by imparting knowledge and facilitating staff and students on emergency preparedness, life and fire safety matters. This would not only cultivate a positive safety culture amongst the NUS community but also make NUS a disaster-resilient university.

2. Incident Statistics

An overview of the NUS workplace safety and health performance – Accident/Incident statistics for 2013

The total number of incidents reported to OSHE in 2013 is 316. Table 2 shows the breakdown and compares the data over the last three years:

Description		2011	2012	2013
Reportable to regulators	Occupation-related incidents	6	5	2
	Workplace related incidents	4	8	14
Non-reportable to regulators	Occupation-related incidents	99	79	60
	Student-academic related incidents	110	106	90
	Workplace related incidents	124	136	150
Total		343	334	316

Table 2- Number of incidents reported to OSHE

Note: Definitions

1. Occupation-related incident - Any incident that happened in the course of duties assigned by the employer
2. Student academic related incident - Any incident that occurred in the course of student academic study
3. Workplace related incident - Any incident not arising out of work but occurring within University compound or during official University activities.
4. Reportable incidents are incidents which have resulted in more than 3 days of medical leave, fatality, occupational disease or a dangerous occurrence as defined by the Ministry of Manpower.

Occupation-related Injuries or incidents involving staff

- 62 cases of occupation-related incidents were reported in 2013. This is a decrease from 2012. Of these, two were reportable incidents while the rest of the incidents either did not result in any injuries or resulted in only minor injuries.
- The reportable **Injury Rate** for NUS is 19.6 per 100,000 employed persons. This is below the industry injury rate of 251 for general industry (Refer to Figure 4).
- Overall **Incident Rate** involving staff has reduced by 42%, from an incident rate of 87.0 in Year 2011 to 50.3 per 10,000 employed person in Year 2013 (Refer to Figure 5). The target set is to reduce the incident rate to 82.7 by 2014.

Student-academic related Injury/incident involving students

- The incident rate for all students (undergraduate & graduate) has decreased from 31.6 per 10,000 students in 2011 to 24.1 in 2013 (Refer to Figure 6). The target set is to reduce the incident rate to 30.0 by 2014.

Non work-related injuries

- There were 164 cases of non-work related injuries reported to OSHE in 2013. These were incidents occurred within the University compound but did not arise out of work or official University activities. 71% of these cases were as a result of slips, trips & falls in the workplace. Measures are put in place to review and improve the slip, trip & fall prevention program.
- 14 of these cases, in which the injured staff were given more than 3 days of medical leave, were reported to regulators.

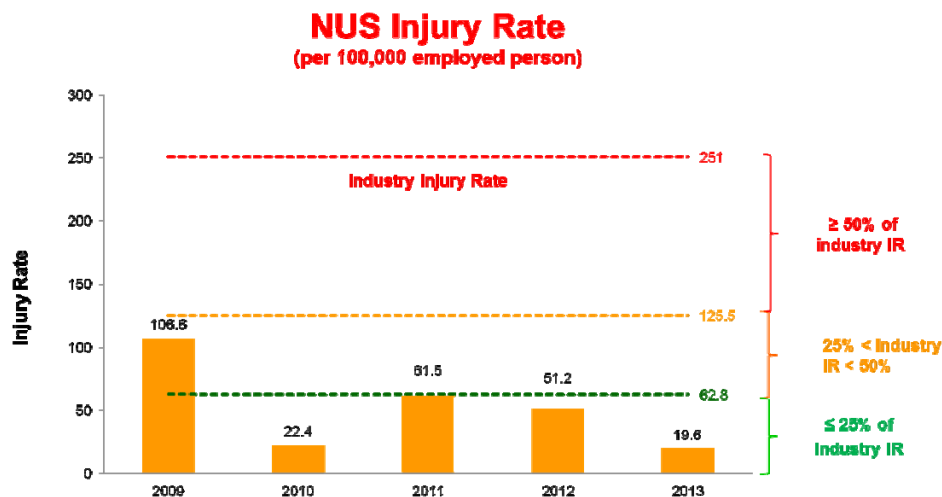


Figure 4- NUS Injury Rate (MOM reportable occupation-related accidents only) from 2009 to 2013. The target is to reduce the Injury Rate by 5% using 2011 (green line) as the base year.

NUS Restricted

NUS has successfully kept its reportable injury rate below 25% of the industry injury rate for the past 4 years. OSHE's target is to reduce the Injury Rate, Incident Rate (Staff) and Incident Rate (Student) by 5% using 2011 as the base year.

In 2013, NUS achieved the lowest injury rate since 2009, with an injury rate of 19.6 per 10,000 employed person.

Definition of **Injury Rate** =
$$\frac{\text{No. of reportable occupational - related injuries} \times 100,000}{\text{No. of Employed Persons}}$$

Definition of **Incident Rate** =
$$\frac{\text{No. of occupational related incidents} \times 10,000}{\text{No. of staff or student}}$$

Incident Rate (Staff) (per 10,000 staff)

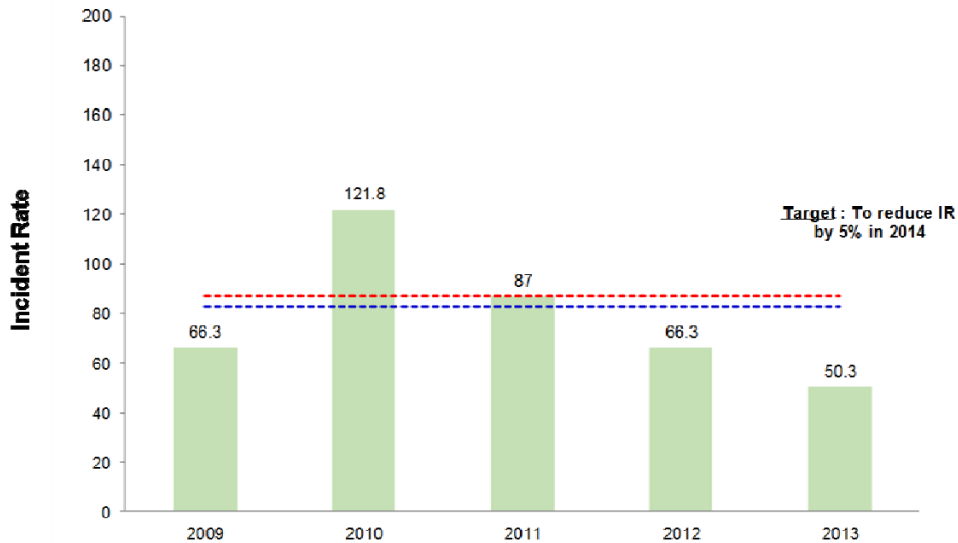


Figure 5- NUS Incident Rate (per 10,000 staff) from 2009 to 2013

Incident Rate (Students)
(per 10,000 students)

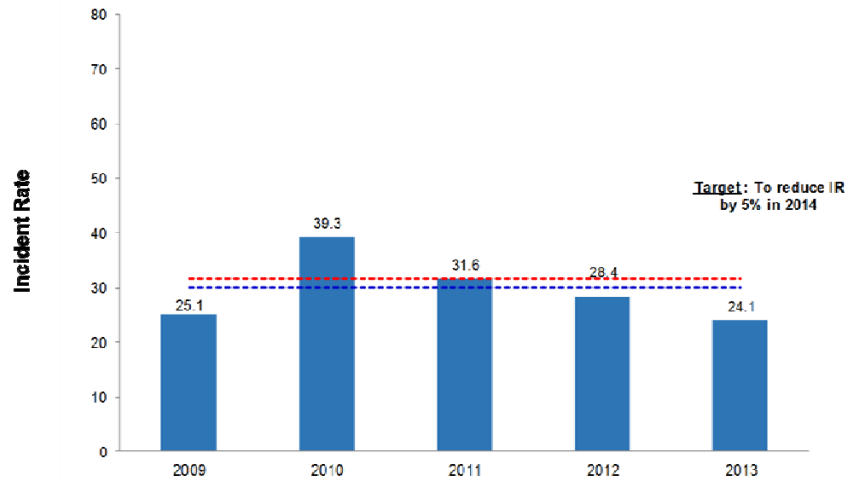


Figure 6- NUS Incident Rate (per 10,000 student) from 2009 to 2013

3. Safety & Health Programmes

Safety and Health Professionals

Safety and health professionals/officers play a key role in the successful implementation of safety & health management system and raising safety & health standards in any institution. In NUS, 22 staff from Office of Safety Health and Environment serve as the Safety and Health Officer to the 36 faculties and research institutions and centres on campus.

The Faculty Safety & Health Officers' primary responsibility is to facilitate the implementation of the safety and health management system and to provide advice on safety & health matters to their respective faculty or research institute and centres. Their duties include the following:

- Act as the resource person on all safety and health matters. They advise on regulatory and university requirements and facilitate their compliance;
- Provide the liaison between faculty/institute, regulators and OSHE;
- Serve as the secretary for the safety committee of their respective faculty or research institute;
- Act as the internal consultant to the departments and research groups undergoing compliance audits and assist them in the preparation of internal audits and external inspections;
- Promote safety awareness by safety trainings and safety promotional events; and
- Assist the departments in incident investigations, identification of root causes and implementing the corrective and preventive actions.

Highlights

Compliance review

The safety and health officers performed a review of the regulatory compliance status of their respective faculties and departments. The objective for this exercise is to identify applicable legal legislations specific to the Faculties, Schools, Research Institutes and Research Centers in NUS, to identify any improvements in safety programs that are being implemented. The Safety and Health Officers work with the safety representatives from each area to implement the program improvements.

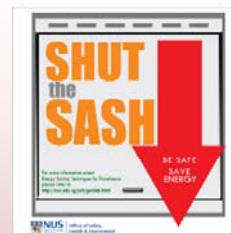
Safety Promotion

Some faculties/departments organise safety events to raise safety awareness levels among staff and students. For example, the Faculty of Science's (FOS) annual Safety Week was from 23 Sep - 27 Sep 2013. *Ergonomics and Health* was the theme of their Safety Week. Several events, including Safety Slogan competition, Safety Poster competition, "2-Minute of Safety" Video, "My Ergo Innovation" and Word Search, that encourage student and staff participation were conducted during the week. More than 350 staff and students attended these events.

The Faculty of Engineering's Safety Day was also held in Sep 2013. A more detailed write-up on FOE's Safety Day can be found in Safety Promotion on Faculty Safety & Health Day – Faculty of Engineering Annual Safety & Health Day 2013 (Page 32).

Chemical Fume Hood De-cal

Chemical fume hoods are widely used in the Teaching & Research labs and it is important for safety and energy efficiency reasons that the slash is lowered when the fume hood is in use. OSHE printed more than 1,000 stickers to educate and remind users to lower the sash.



Lab commissioning tool kit

To assist new PIs to set up their laboratories in NUS, OSHE prepared lab commissioning tool kits which would be issued by Safety and Health Officers to the PIs and their team members when the Safety & Health Officers conduct lab commissioning inspections. The tool kit includes key information such as hazardous waste/equipment disposal labels, GHS labels, emergency eye wash inspection tags, etc.

Accident Investigation Kit

OSHE conducts investigations as part of the accident review process. OSHE has prepared an accident investigation kit containing various types of personal protective equipment to adequately protect the investigators from the hazards they would potentially face while working on site.





Retractable Safety Belt in Lift

The retractable safety belt is a device that is installed inside a lift and serves as an effective control measure to deter other lift users from entering lift when the lift is used to transport hazardous materials. The design of the device was enhanced to facilitate its maintenance and to protect it against damage during use. The device has been installed in 26 lifts on campus.

⊖ DANGER: DO NOT ENTER! HAZARDOUS MATERIALS ⊖

Industrial Hygiene

OSHE addressed 42 cases of Industrial Hygiene (IH) related issues in the 2013.



Indoor Air Quality

In 2013, 12 cases of feedback on poor Indoor Air Quality (IAQ) were reported and investigated. Almost half of them were related to building Mechanical Ventilation and Air-Conditioning System during the haze period in June. OSHE worked closely with the Office of Facilities Management (OFM) to address these issues. The team responded swiftly, and a task force was formed to develop engineering solutions to mitigate future indoor infiltration of Respirable Suspended Particulates (RSP).

Enhancement of Chemical Safety Training Materials

OSHE revised its chemical safety training materials to highlight the importance of chemical storage in an appropriate, chemically-compatible container. The training slides were updated to include safe transportation of chemical waste using the approved chemical waste trolley, control measures for chemical transportation like retractable belt with warning labels in lift, use of chemical carrier bottle for chemical transfer and appropriate response in a chemical spill emergency.

What our stakeholder says about us

To Ms Gisela Ho, Gabriel Chen and Dr Leong Wei Lee:

On behalf of the DBS Safety Committee, I would like to express my sincere appreciation for the time you and your ERT team spent today in dealing with the acid leakage in one of DBS labs, and recommending technical strategies and procedures in handling the spills. I especially appreciated the timely and professional service you offered in handling the spills. The leakage would not be controlled so efficiently without your professional service. Meanwhile our staff learnt a lot from your practice in handling this spill case. Our committee will look into this and improve our procedures to prevent this from happening again in the future.

- Mr Yan Tie, Department of Biological Sciences (27 Feb 2013)

Biological Safety

As part of the Biological Safety Program, the Microbiological and Biomedical (MB) Group of OSHE reviews all research work involving the use of biological agents and/or animals. The MB Group also works closely with various internal and external stakeholders including NUS Institutional Biosafety Committee (IBC) in the delivery of the NUS Biosafety Programme.

Highlights

Project risk assessment (PRA) reviews

The Microbiology & Biomedical (MB) Group of OSHE carries out project risk assessment (PRA) review for life science-based research protocols and animal-related research protocols on behalf of Institutional Biosafety Committee (IBC). In 2013, the group reviewed **413** PRAs and **414** animal protocols (IACUC). This is an increase of **40%** in the number of PRAs reviewed compared to 2012 (as shown in Table 3). This can be attributed to a greater emphasis in life science research.

Laboratory inspections

The biosafety team conducted **23** laboratory inspections to ensure compliance to the veterinary biologics licence requirements, and had coordinated **7** inspections that involved local regulatory agencies namely AVA, MOH and NEA. Annual safety inspections for all the animal facilities (more than 40 labs at various buildings – MD2, MD11, CeLS & DBS) in NUS were also carried out in the 4th quarter of the year.

Genetic Modification work review

87 proposals were reviewed on behalf of the IBC for submission to the Genetic Modification Advisory Committee (GMAC) for endorsement of research projects involving genetically modified organisms.

Hazard communication for animal research

Animal research is a vital component of research activities of the University. For projects involving animals, Hazard Summary Sheets (HSS) are generated by OSHE to summarize the pertinent safety information for each protocol. A total of **116** HSS were issued for the purpose of communicating hazards to researchers and animal husbandry staff involved in animal-related research protocols.

Laboratory commissioning/decommissioning

As the university continues to grow and evolve, old buildings are being upgraded. Renovation and upgrading works are carried out extensively in the Yong Loo Lin School of Medicine. About **100** lab commissioning and decommissioning inspections were carried out to facilitate the relocation of laboratories.

Description	2012	2013	% increase
Issue of Hazard Summary Sheets	77	116	50
Project Risk Assessment (PRA) reviewed	294	413	40
GMAC proposal reviewed	85	87	2
Material Transfer Agreement (MTA) reviewed	122	99	-18
IACUC submissions reviewed	414	414	0

Table 3 – Summary of Review Conducted by the MB Group of OSHE

Other milestones

AAALAC review for NUS animal research programme

In 2013, the Council on Accreditation of the Association for Assessment and Accreditation of Laboratory Animal Care (AAALAC International) re-certified the NUS animal facilities. During the re-certification inspection and review, AAALAC took special note of the effective communication among OSHE, IBC and the Institutional Animal Care and Use Committee (IACUC) and the robust review process for animal protocols.

Lean & Green Improvement Projects

A major complain by researchers is the amount of paperwork to fulfill regulatory and institutional requirements. As such, OSHE embarked on the following improvement projects to streamline and simplify their processes to improve time saving and customer satisfaction.

1. Integrated Biorisk Manual

All biosafety related guidelines that were previously in separate documents (SOPs) were consolidated into one main document for ease of reference by users. New chapters (e.g. Transport of Biological Materials & Biosecurity) were added into the manual.

2. Online submission of GMAC forms

The new IT application enables researchers to submit GMAC forms electronically for OSHE review and approval. This is more convenient than submitting hard-copies.

3. Granted NUS institutional licence to possess veterinary biologics

Having an institutional licence from Agri-Food & Veterinary Authority of Singapore (AVA) eliminates the need for the authority to audit each individual researcher's lab. This has helped reduce the administrative load on our researchers.

4. Harmonization of animal research protocol review process

Animal research safety team liaises with the Institutional Animal Care and Use Committee (IACUC) and Comparative Medicine (CM) to discuss all protocols in a 3-party meeting to ensure safety of animal research in NUS. This has helped to expedite the approval process. Implementation of the integrated On-line Regulatory Compliance (iORC) system (Figure 7) for Principal Investigators (PIs) to submit IACUC forms and OSHE risk assessments on the same portal has also helped to improve the co-ordination and workflow between these two offices in managing animal research and compliance by researchers.

Figure 7: New online system for submission of OSHE & IACUC forms

5. Material Transfer Agreement (MTA)

The current process of MTA clearance was reviewed and discussed with the International Liaison Office (ILO) and the workflow was redesigned to simplify the process for PIs and also reduce the number of reviews by OSHE staff.

What our stakeholders say about us

Dr Lim Cheh Peng

On the behalf of CSI, I would like to thank you for the time to provide the safety leads in CSI on the Regulatory Requirement for Viral Vectors. The Safety Leads have learn a lot through this session and hopefully we can invite more speakers from OSHE.

- Mr Melvyn Tan, CSI (27 Sep 2013)

To Ms Sania

Many thanks for your great assistance in helping my staff in completing the submission. Appreciate it all! Have a great day ahead! Thank you and best regards! Best wishes!

- Dr Tang Kok Zuea, Lecturer, FOE (7 Oct 2013)

Dear Dr Lim Cheh Peng

It is our distinct pleasure to have the opportunity to express our sincere gratitude on behalf of SMART and MIT for your outstanding service as an observer on the SMART IBC. You have been an invaluable resource to SMART as you consistently provide excellent, timely advice and very important and thoughtful guidance. You are professional, gracious, friendly and kind in all your intentions. It is a great pleasure for all to collaborate and work with you.

- Dr Rohan Abeyaratne, Director, SMART
- Mr William VanSchalkwyk, Managing Director EHS, MIT
- Mr Lou DiBerardinis, Director, EHS, MIT

Radiation Safety

Research at NUS involves extensive use of different sources of ionizing and non-ionizing radiation like radioisotopes, particle accelerators, two-photon excitation microscopes, magnetic resonance imaging apparatus etc. The major goal of the Radiation Safety Program is to reduce the risks associated with working with ionizing and non-ionizing radiation at NUS. The Program ensures that the use of radiation is conducted in a manner to protect and minimize one's risks to health, safety and property.

Highlights

Recycling of Unwanted High Activity Sealed Sources

In 2012, the project to remove 11 unwanted high activity sealed sources from the NUS campus started. It was completed in 2013. These sources with a total activity of 7.6 Curies were shipped to a radioisotope recycling vendor in Germany in late 2012. The sources safely reached Germany in January 2013 and Final Proof of Acceptance was obtained. The project was officially closed in May 2013. The completion of this project resulted in significant reduction in the risk from storing these high activity sources.

Inventory of Sealed Sources in NUS

In 2013, NUS rolled out a major drive to gather information of all sealed radioisotope sources in the university. OSHE created a master inventory of all such sources and the licensees possessing and using such sources on campus. This has helped NUS better manage the risk levels from usage of such sealed sources. This inventorying exercise has reduced the risks of having any "orphan" sources that might require special attention to ensure safety.

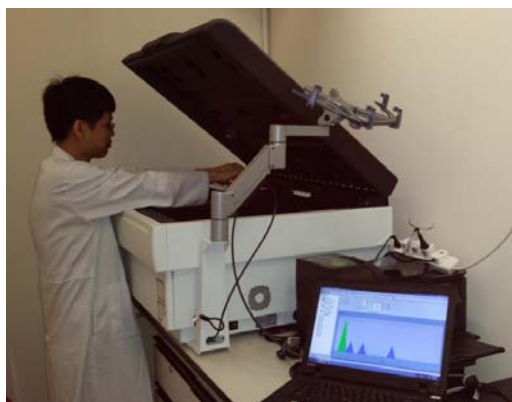
Successful completion of Inspection by IAEA and NEA

- On 31 Oct 2013, International Atomic Energy Agency (IAEA) and the National Environment Agency (NEA) jointly performed an inspection of the radioisotope store room at the Faculty of Science. The scope of the inspection was to verify the inventory of radioactive sources that were being stored at that location. They also verified the radiation levels and reviewed the security mechanisms. The inspectors were impressed with the security mechanisms in place and commended NUS for maintaining a registry in a way that allowed easy identification and verification of the radioisotopes being stored.

- Another inspection by NEA was also carried out in October 2013. Here, NEA performed an inspection of sources that were classified as Category 2 under IAEA safety guidance document RS-G-19. Such sources fall under “Very Dangerous to Person” or medium risk category. During the inspection, NEA verified the location of these sources and also the radiation levels and security measures at the storage locations. NEA commended NUS for the radiation protection measures that were in place. OSHE established and constantly reviews the radiation protection measures in partnership with the departments hosting these sources.

Implementation of Contamination Monitoring Program

There was a major push towards implementing a radiation contamination monitoring program in 2013. OSHE purchased a Liquid Scintillation Counter (LSC) that can be used for monitoring contamination. The faculties and laboratories that use unsealed radioisotopes were identified and requirements of contamination monitoring were communicated. Safety and Health Officers from the Faculty of Science, Faculty of Engineering, Yong Loo Lin School of Medicine, Faculty of Dentistry and various other Research Institutes were trained in performing swipe tests and using LSC. The LSC has become an invaluable tool for these safety and health officers to verify the effectiveness of the contamination monitoring performed by radiation workers. The Safety and Health Officers play a key role in ensuring the radiation contamination monitoring is implemented in their respective areas of work.



Radiation contamination monitoring

Others

A summary of the outcomes of the fire safety programme is shown in Table 4.

Description	2013
No of persons attended the Radiation Safety Training course	1098
No of Safety Consultations on Radiation Safety	29
L3 Licence to keep or possess an irradiating apparatus for use (other than sale)	41
L4 Licence to keep or possess radioactive materials for use other than sale	6
L5 Licence to use an irradiating apparatus (other than sale)	37
L6 Licence to use, handle and transport radioactive materials (other than sale)	64
N2 Licence to keep or possess for use non-ionsing irradiating apparatus	391
N3 Licence to use the non-ionsing irradiating apparatus	225
R1 Registration as a radiation worker	215
No of bags of radiation wastes disposed	188

Table 4- A summary of the outcomes of the Radiation Safety Program

Other milestones

Research imaging capabilities for human beings and animals.

In 2013, NUS installed a new and superior medical imaging modality called positron emission tomography (PET) and magnetic resonance (MR) imaging, which is also known as PET/MR. The combined PET-MR system is located at Clinical Imaging Research Center (CIRC) at MD6. PET/MR will be complemented by a radiochemistry suite and cyclotron that will enable in-house production of a range of clinically relevant PET tracers.

In 2013, Comparative Medicine Imaging Facility (CMIF) - a new state-of-the-art small and large imaging facility - acquired several imaging equipment for the use of NUS investigators. The small animal imaging systems that were procured are the High Frequency Ultrasound, IVIS Imaging System, Micro-PET and Micro-CT.

To ensure the successful completion of the project, OSHE reviewed and approved 89 permits in 2013. OSHE performed evaluations of the facility plan and shielding to ensure that the resulting radiation dose to personnel would be maintained As Low As Reasonably Achievable (ALARA). OSHE recommended installation of an advanced radiation monitoring system for real-time monitoring of radiation levels at the CIRC. OSHE assisted in ensuring that these facilities are built in compliance to regulatory requirements and provided necessary support for the successful inspection and approval by the regulators. All necessary radiation licences were obtained and ensured radiation monitoring program is implemented. OSHE also provided advice on risk assessments and SOPs for usage of these equipment.

General Safety

The increasing diversity of research activities on campus has resulted in research acquiring different types of equipment with a wide spectrum of hazards. To provide guidance to the faculties and institutes in identifying and implementing the necessary operational controls, NUS has established various other safety programs like Lock-Out Tag-Out (LOTO), Ergonomics and Occupational First Aid programs.

Highlights

Lock-Out Tag-Out (LOTO) Guidelines

During routine maintenance, servicing and repair on hazardous equipment, there is a possibility of unexpected start up or release of stored energy that could cause injury to such maintenance personnel. The risk can be mitigated by placing a lock and/or warning tag on an energy isolation device.

In 2013, OSHE developed and launched standards and guidelines for establishing and implementing such lock-out tag-out procedures to ensure safety during maintenance of such equipment. The standards and guidelines also defined the roles and responsibilities of different stakeholders and delegated the ultimate responsibility of compliance to the owner of such equipment. The guidelines also emphasized the need for a risk assessment to be conducted where the risk to all the stakeholders are to be evaluated.

Ergonomics talks

OSHE helped the faculties organise Ergonomics related talks which were presented at major events in the University.

For example, OSHE staff worked with the Faculty of Science to organize a talk on Office Ergonomics during its safety day on 27 Sep 2013. Ms Ngo Xueting, Senior Physiotherapist from Tan Tock Seng Hospital presented on office ergonomics to help students and staff understand and identify common back and neck conditions and also provided advice on proper sitting and working postures. Ms Ngo also demonstrated simple exercises that can be performed to minimize musculoskeletal injuries and other ergonomic hazards.

Similarly, the University Health Center organized a talk on Office Ergonomics during the 2013 Wellness Conference on 6 Dec 2013. Mr Patrick Ker Thye San, Senior Principal Occupational Therapist from Singapore General Hospital presented on risks from poor setup of workstation and ways of minimizing musculoskeletal injuries during routine office work.

About 600 staff and students attended various talks and training courses in Ergonomics.

Field Research Safety

Field Research Safety Programme provides guidance to researchers when conducting field experiments or during their travels for the collection of specimens.

Highlights

Safety Guidelines for Field Trips

OSHE issued a set of guidelines on field research safety. Advice on risk assessment, sample transportation, preparing and responding to emergencies are in the document. Templates and forms such as indemnity form and field trip checklists are also included.

Consultation and Outreach

OSHE conducted a 90 minute workshop on Field Research Safety during the Safety Health & Environment Conference held in August 2013. OSHE also conducted a seminar on Field Research Safety for the Singapore Delft Water Alliance (SDWA) and Department of Geography researchers in 2013.

To improve our advisory and consulting capability, an OSHE staff, Dr Gauri Parab, attended a wilderness first responder course. The course was organized by HMI Institute of Health Sciences.



Field research safety training conducted by Mr Ravindran s/o Sockalingam & Dr Gauri Parab



First aid and night rescue training during the wilderness first responder course

Safety Promotion

To promote a progressive and persuasive safety culture, OSHE conducted a number of safety and health promotional programmes. These programmes reward and recognize departments, staff and students contributions to raising safety standards in their respective workplaces

Highlights

Annual Safety & Health Performance Award (ASHPA)

13 departments were recognized for their efforts and good safety & health performance at the NUS Annual Safety & Health Performance Award 2013. These departments were being evaluated on the comprehensiveness and robustness of their department safety and health management system and their safety performance in 2012. The heads of department or the safety chairs of these departments collected the award from the NUS President, Prof Tan Chorh Chuan.



One of the award recipient, Prof Wong Hee Kit, from Dept of Orthopaedic Surgery receiving the Award from NUS President, Prof Tan Chorh Chuan

Safety Team Award and Recognition (STAR) Program

Safety Team Award and Recognition (STAR) Program encourages staff to identify solutions to safety and health challenges they face at their workplaces. In 2013, the STAR program received over 27 project submissions. The winning team from Lee Kuan Yew School of Public Policy formulated a device that reduces the possible fire safety risks in Audio Visual systems by automating their shut down when they are not in operation.



STAR winning team from Lee Kuan Yen School of Public Policy

NUS Safety & Health Conference 2013

The inaugural NUS Safety & Health Conference was held the 1 Aug 2013. The half-day Conference attracted over 300 participants from the NUS community. Safety professionals and faculty members presented on issues relating to Safety and Health challenges in NUS. Workshops were conducted in the afternoon on specialized safety topics such as ergonomics and field trip safety. The Conference also highlighted the achievements of the STAR program award winners.



One of the Speakers, Dr Goh Yang Miang presenting at the conference



STAR award team members from Computer Centre, were receiving award during the conference

OSHE 10th Anniversary Dinner Event

OSHE celebrated its 10th anniversary with a dinner on the 28 Feb 2013 at the Kent Ridge Guild House. The theme of the event was “A journey of partnership for safety excellence!” to celebrate the continual partnership between OSHE and departmental staff, local regulatory agencies and international collaborators.



Cake-cutting Ceremony by the Guest of Honor & VIPs



OSHE staff with Mr. Louis DiBerardinis, Director, Environment, Health and Safety Office, Massachusetts Institute of Technology

Faculty Safety & Health Day – Faculty of Engineering Annual Safety & Health Day 2013

The Faculty of Engineering (FOE) is one of the faculties that had its own faculty safety and health promotional event. FOE's annual Safety & Health Day was held on 27 Sep 2013. With “Stop the Assumptions, Stop Work Accidents” as the theme (which was also in alignment with the national WSH campaign), about 350 staff and students participated in the fun filled event. Prof Chan Eng Soon, Dean of Engineering, kicked off the event by addressing staff and students in a packed auditorium. This was followed by a speech on safety culture by Dr Peck Thian Guan, Director of Office of Safety, Health and Environment.



Dean of Engineering, Prof Chan Eng Soon addressing FOE staff and students



Vendor/Supplier exhibition booths

Safety and Health Training

Safety and Health Training is a critical part of the NUS Safety Management System. OSHE established a Structured Safety Training System (SSTS) that defines the requirements for safety and health trainings for the staff and students exposed to various hazards as part of their activities. OSHE develops and conducts a variety of training courses on various safety disciplines like biological safety, chemical safety, radiation safety, risk management etc., to improve the safety awareness of staff and students.

Highlights

Fire Safety Awareness Training

In 2013, NUS obtained the distinction of having 100% of its staff being trained in fire safety awareness using IVLE e-learning platform.

OSHE partnered with Computer Centre, Office of Human Resources and fire safety coordinators in various departments to communicate and monitor the completion of this goal set by the NUS President. Deans, Heads of Department and members of various safety committees supported OSHE in rolling out this course and ensured the completion of this course by their staff. The development and implementation of such additional training program is another manifestation of OSHE's focus on customer service, enhancing safety awareness and facilitating regulatory compliance.

Structured Safety Training Scheme

Excluding the fire safety training mentioned above, OSHE offered more than 7,565 training places in 2013 for on-line as well as classroom training in various aspects of safety & health. Chemical safety training (IVLE) and biological safety training (IVLE) (shown in Table 5 & Figure 8) were the two most popular courses. They accounted for about 40% and 25% of all trainees.

Safety Trainees in 2013

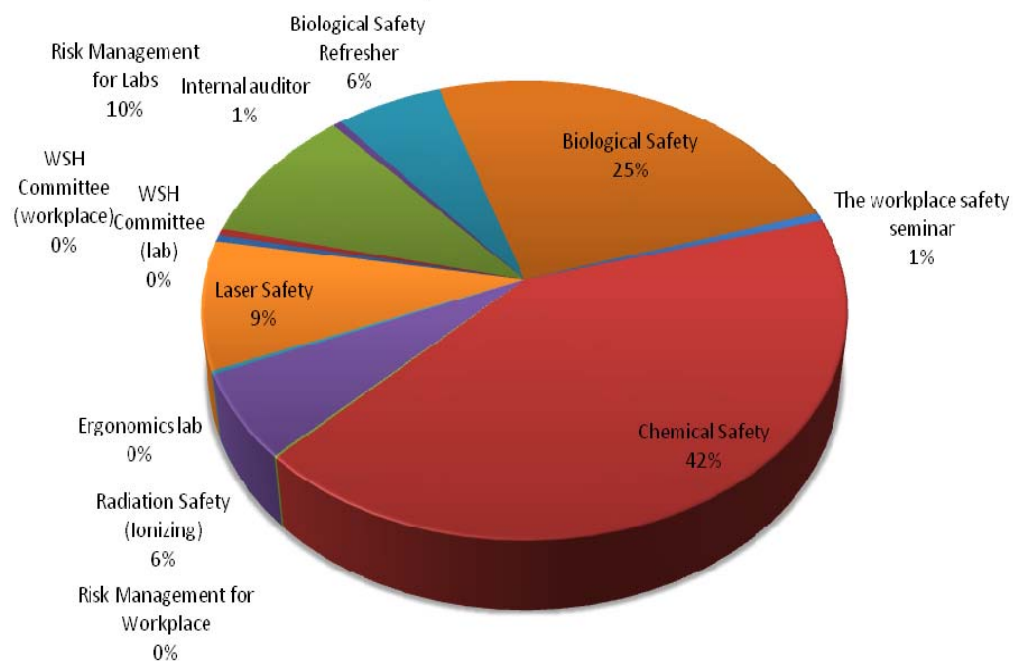


Figure 8 – Training Places: Breakdown by Course Type

Summary of SSTS	No of Trainees		
	*2011	2012	2013
IVLE Courses			
- Biosafety (refresher)	-	49	460
- Biosafety	-	1308	1888
- Chemical Safety	-	2063	3163
- Radiation Safety (Ionising)	-	301	456
- Laser Safety	-	477	686
Sub-total (IVLE Courses)	-	4198	6653
Classroom Courses			
Sub total (classroom)	4735	715	912
Grand Total	4735	4913	7565

Table 5-SSTS training breakdown by course type

* Note: In 2011, only classroom training courses were available; IVLE courses were implemented in 2012

With the use of IVLE, OSHE's courses are now accessible to a larger audience. Researchers are able to access the materials and take the on-line quiz at their convenience.

Other milestones

Presentation at the 4th International Conference on Safety and Health in Research and Education

At the 4th International Conference on Safety and Health in Research and Education held in Singapore, NUS shared its experience in launching safety trainings through e-learning portals. The courses were provided through NUS E-learning platform – Integrated Virtual Learning Environment (IVLE) that was used for teaching course modules. NUS shared the strategies that were adopted and also the lessons that were learned in developing and providing safety and health trainings through E-learning. NUS also shared the features of this E-Learning platform that helped in the successful launch and implementation of this online training.

Laboratory Design

To ensure that the University's renovation / regularization and construction of its labs, buildings and other facilities meet the NUS Safety, Health and Environmental standards, OSHE provides advice during the initial planning and design of these facilities and labs.

Highlights

Key projects in 2013 where OSHE was involved:

1. Construction of new buildings, such as Academic Green (Frontier Canteen), Engineering Design and Innovation Centre (EDIC), New building in School of Design and Engineering (SDE), Centre for Oral Health (COH), University Sport Centre (USC), Block Admin AS 8 and LT 7A.
2. Regularization or renovation of buildings, such as MD7, Buildings in Faculty of Engineering, MD 4/4A Level 2 labs, MD 11 and MD 9.

In 2013, OSHE staff reviewed 69 capital projects and A&A projects and attended more than 227 design review meetings. Table 6 summarizes the improvements made following the design review.

Improvements	Description of Improvements	Projects
Cold Room Consolidation	Minimize the number of cold rooms by encouraging departments and laboratories to share cold rooms	Regularization and renovation of buildings - MD4/4A - MD7 - MD9
Chemical Cabinets Consolidation	Consolidate hazardous chemical cabinets in a single room, instead of individual laboratories	Regularization and renovation of buildings - MD4/4A - MD7 - MD9 - MD11 - S4 Level 5 - S5 Level 4 & 5 Construction of Centre for Oral Health
Equipment consolidation	Consolidate Freezers, Fridges, etc in insulated equipment room. This is to control the heat load and noise.	Regularization and renovation of buildings - MD4/4A - MD7 - MD9 - MD11 - S2 Level 2 & 5 - S3 Level 6 - S5 Level 1 & 5 - S8 Level 5 Construction of COH

Table 6-Summary of lab reviews conducted by OSHE and the improvements made after design review

Occupational Health Programme

The NUS Occupational Health Programme aims to protect the health of staff and students at work. Based on the risk exposure, the programme provides medical surveillance from the time they join the university, as they undertake different work activities and work in diverse workplaces within the university, till the time they leave the university.

Highlights

1. The stewardship of the Occupational Health (OH) Clinic was transferred to the University Health Centre (UHC). With this transfer, all clinical services are now provided by UHC. At the same time, the costs for OH services were placed with the departments and Principal Investigators. The OH Program for NUS, however, remains under the purview of OSHE.
2. The Occupational Health physician, Dr Gregory Chan delivered a lecture on “Occupational Health Concerns in the Dental Profession” during the FOD Safety Day. He also conducted a workshop on “Occupational Health Programme in a Research Institution” during the inaugural NUS Safety and Health Conference.
3. A summary of OH caseload is shown in the Table 7. The OH clinic reviewed 599 animal research registrations to monitor animal workers for potential health effects from working with animals and improving work practices for animal research. This included support during the AAALAC accreditation for Comparative Medicine.

OH Caseload	2011	2012	2013
Animal Work Questionnaire Reviews	609	610	566
BSL 2 Work Questionnaire Reviews			16
BSL3 /ABSL 3	46	36	16
Statutory Medical Examination	420	193	186
Ionising Radiation	142	209	156
Laser	115	120	190
Respirator fitness	530	320	230
Research divers	56	61	25
Work injury / Disease cases	67	125	70
Total	1994	1674	1455

Table 7- Summary of OH Caseload

Laboratory Safety & Health Management System Certification Scheme

All Principal investigators (PIs) and academic staff who have supervisory oversight of laboratory activities are required to develop and implement a safety & health management system (SMS). The lab supervisor/ PIs' SMS would then be audited and certified by OSHE.

All laboratory-based PIs were certified to the NUS Laboratory Occupational Safety & Health Management Standard by end 2012. They are re-audited at least once every three years. New PIs who joined NUS after 2012 will be introduced to the SMS and the audit protocol and be audited within the first six months.

Highlights

NUS iAudit Apps

In April 2013, OSHE launched an in-house developed application for the iPad that would facilitate audit report writing and compilation. The Apps is a result of collaboration between OSHE and the Computer Centre. Through the use of the iPad application, OSHE improved its productivity and the auditors are able to provide audit report in a timelier manner. The improvement in the turnaround time for report generation is shown in Figure 9.

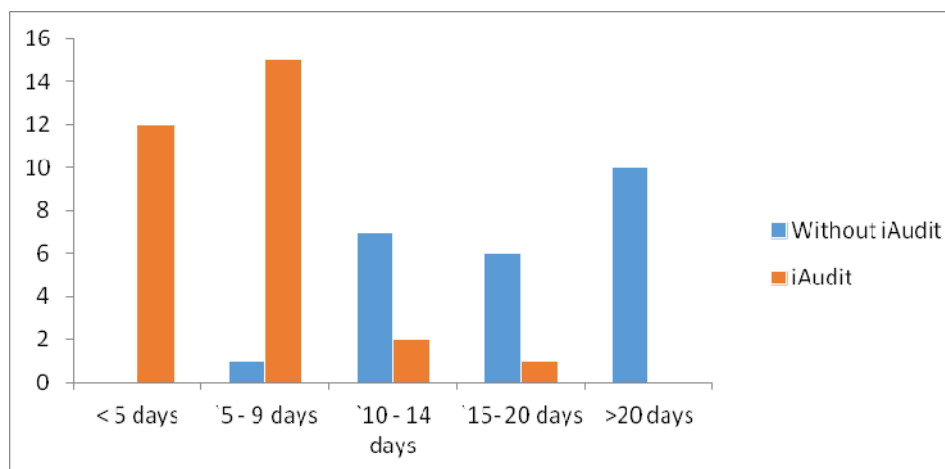


Figure 9-Chart: Number of reports vs days taken to generate audit reports.
(Data for iAudts were from Apr to Dec 2013)

Construction & Infrastructure Safety

The NUS Construction Safety Program was established to protect the safety and health of NUS staff, students, and visitors from hazards associated with its construction activities. OSHE reviews the design of capital and A&A projects, risk assessments of contractors, conducts training to our project managers, and organizes and facilitates safety and health committee meetings to ensure compliance with all applicable OSH legislation and codes of practices and adoption of safety & health best practices. OSHE also provides the oversight of safety systems for departments involved in maintenance of buildings, the provision of transport, logistics, management of retail and dining services to the NUS community.

Highlights

Contractor Safety Management Program

This program provides a platform for the NUS contractors and their project coordinators & managers to share best safety practices. A Contractors' Safety Committee was formed in March 2013 and meetings were carried out on a monthly basis to share incidents, best practices and discuss other safety related matters.

Contractor Selection Program

OSHE staff are members of OED's tender evaluation committee to help assess contractors' safety & health track record and safety performance. OSHE participated in 27 tender evaluations in 2013.

Slip, Trip and Fall (STF) Prevention Program

This program was initiated to minimize STF incidents in NUS campus. Incident investigation and data analysis were carried out. Proactive measures would be introduced during design reviews, construction and facilities maintenance stages. The analysis of the past five year incidents was completed and further studies and investigations are being carried out to finalize the program implementation.

Risk Assessment Reviews

OSHE conducted 53 Design and Risk reviews which include lifting plans, work-at-height etc.

Appreciation for Good Safety & Health Performance

Letters of commendation were presented by NUS management to contractors for implementing and maintaining good safety and housekeeping records.



Letter of Appreciation presented to Kajima for good site safety performance for MD1 project.
Kajima did not receive any zero demerit points in 25 consecutive site inspections.

Inspections/ Audits

OSHE performs inspections/audits of capital projects and A&A projects. In 2013, more than 70 inspections were conducted for the three on-going capital projects (i.e. MD1, LKCNHM and YNC) and 26 inspections for A&A projects.



YNC Project – Safety Inspection

Knowledge Sharing

Public sector agencies

- OSHE shared with SMU and SUTD on how NUS manages safety of its construction sites. We welcome such initiatives from other public sector agencies and believe in sharing knowledge and good safety practices.



Knowledge sharing with public sector agencies

Lectures to NUS Students

Mr Mirza Laeeque Baig and Mr Lau Kwok Siong, both Senior Managers of OSHE delivered talks and lectures to SDE students.

Mr Mirza presented to SDE Final Year Students Safety Talk for PF 4202 SHE Management (Common Construction Health and Environmental Hazards and Controls) on 23 October 2013. Lessons learnt from safety inspections and past incidents were shared with the students.



Mr Mirza Laeeque Baig delivering the safety talk to SDE students

Mr Lau presented to the Department of Building Year 3 students on 22 Feb and 12 Dec 2013. These students were on the Student Practical Training Scheme (PTS) (PF3401) Programme. The lecture which dealt with various aspects of safety in the building industry was to prepare them for their internship.

Emergency Preparedness & Management

The University is prepared and organized to manage incidents, emergencies and crisis situations. This is achieved through the introduction of policies and frameworks, training, exercises and drills, audits and inspections and ensuring that the operating units of the university are equipped with the appropriate hardware (e.g. thermal scanners, AEDs) to handle any critical situation. The emergency responses and consultations provided by Emergency Management (EM) Division span across the entire University.

Highlights

The key achievements in 2013 included a marked improvement in faculties' and units' ability to manage their own incidents or accidents independently, resulting in only 22 emergency cases of a more serious nature requiring OSHE's intervention. The faculties and units have been proactive in understanding the approach to emergency management and have made tremendous efforts to take ownership. OSHE would continue this approach in emergency preparedness thus moving us closer towards our vision of a safe and disaster resilient University.

Table 8, Figure 10 and Figure 11 summarize OSHE's efforts in Emergency Preparedness and Management. The number of training courses, exercises and briefing sessions which were conducted had increased compared to 2012 and 2011. This is in line with our emphasis on crisis prevention and preparedness and ownership by faculties and departments.

NUS Restricted

	2011	2012	2013
Emergency Management - Advisory & Consultation			
- Death, serious illness or mental health related cases	31	17	22
- Travel advisory	Nil	6	50
- Pandemic preparedness	6	5	20
- Infrastructure related cases	2	2	12
- Others (Misc)	Nil	Nil	76
Total	39	30	180
Emergency Preparedness – No of training courses, exercises and briefings			
- Crisis Management Course	4	4	4
- Suicide First Responder Awareness Course	3	4	2
- Practical Exercises and Table Top Exercises	5	4	8
- Briefings to Unit Incident Commanders	3	3	9
- Promotional Programs	1	1	1
- Additional training	4	5	4
- Pandemic Preparedness Activities	6	6	20
Total	26	27	48

Table 8- A summary of Emergency Preparedness and Management consultation and training courses

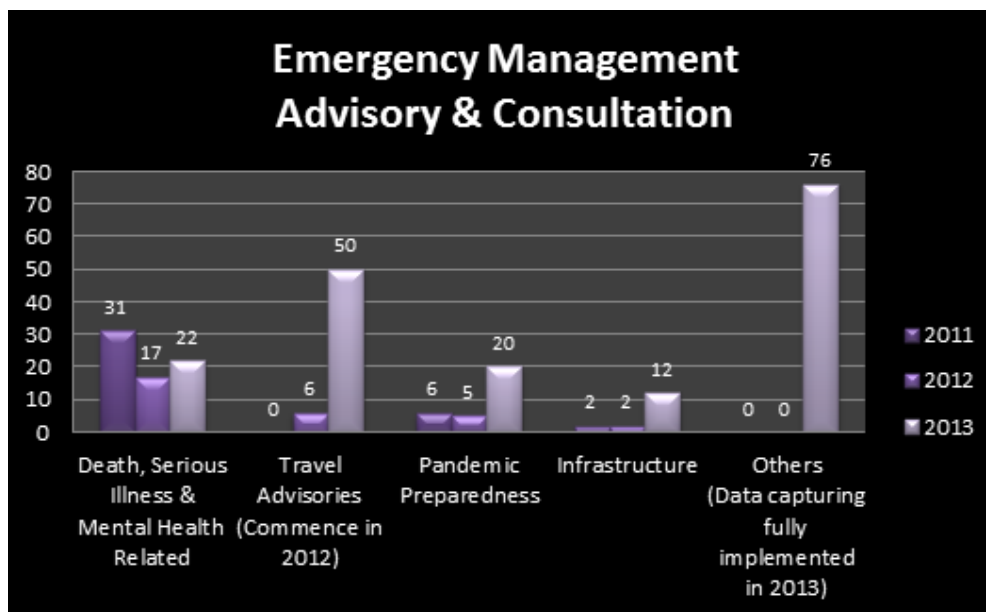


Figure 10 - Types of Emergency Response Advisory and Consultation

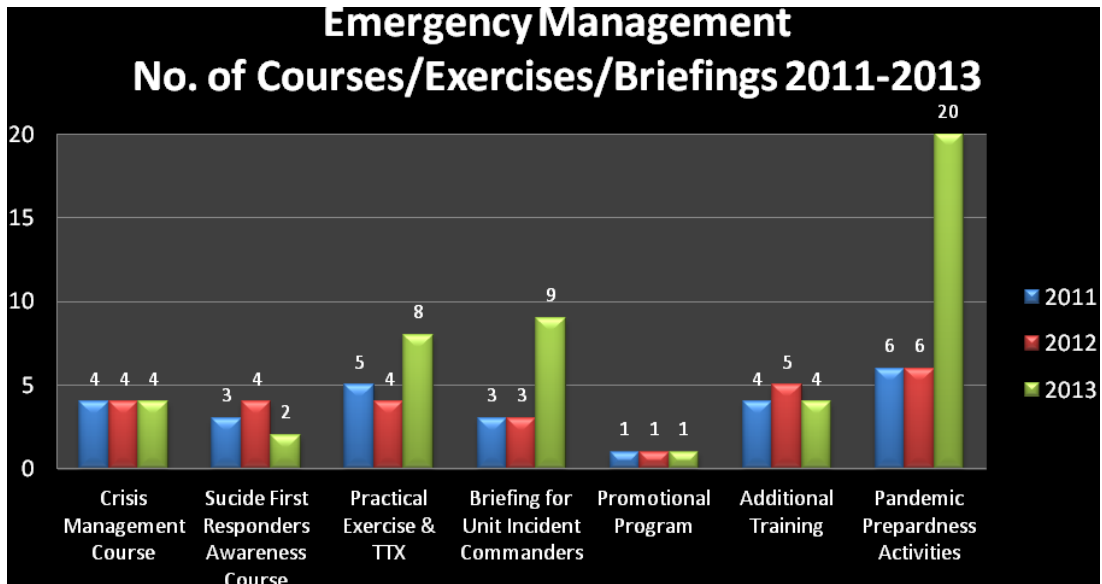


Figure 11- Number of training courses, exercises and briefings

Views of Our Stakeholders and Partners

“In my 16 years association with the halls (Sheares Hall and KE VII Hall), the changes in the expectations of risk management and safety of the hall had been phenomenal. We would not have been able to cope with the changes or the expectations if OSHE has not been actively involved in advising and providing practical help on the ground. This ranged from making a police report to overseas travel advisory. OSHE also encouraged us to craft SOPs which seemed tedious at first but has saved us huge amount of resources when events happened and the SOPs were followed. All these services provided by OSHE cannot be taken for granted as without them, it would be extremely difficult for my hall to discharge our responsibilities to the stakeholders by assuring them that we provide a safe and sound place for the students to blossom. We see OSHE as our important and strategic service support. We hope that OSHE will continue to provide such high value added services”

-Professor Ho Yew Kee, Master, King Edward VII Hall

“A few difficult cases in the past year brought us and colleagues from OSHE together, which we worked closely hand-in-hand in managing the emergency crisis faced. We appreciate the valuable advice offered, especially by Mr. Yam Guan Shyh. It is also commendable that our OSHE colleagues readily avail themselves in providing hands-on support whenever help is needed.”

- Dr Helen Chai, NUS BBA Asst Dean, Director

Life Safety

OSHE provides professional advisory and consultation on life safety, emergency and crisis management for students and staff in the University. Our aim is that events, activities and field trips organised by our students and staff are conducted successfully without any incidents and injuries, and should an accident occur, the students or staff are well prepared to manage it.

Our Life Safety programme has the following components:

a. **Safety and Emergency Management Workshop**

The “Events & Activities Safety and Crisis Management Planning Workshop” is conducted for student leaders on a regular basis or *ad-hoc* upon request.

b. **Temporary Change of Use of Premises Permit Application (TPA)**

An online application is available for staff and students to submit their plans to seek approval for their events and activities if the event involves any change of use of the premises and other safety considerations. Through TPA, OSHE ensures that SCDF fire codes and safety guidelines are strictly adhered.

c. **Advisory and Consultation**

Besides the email and phone consultations, “face-to-face” consultations are also conducted. The students found the consultation sessions to be very enlightening and engaging. They gain a deeper understanding of safety and emergency preparedness considerations during such interactions.

d. **Cardio-Pulmonary Resuscitation & Automated External Defibrillator (CPR+AED) Familiarisation Program**

This 2-hour training course which is available to staff and students since 2008, equips participants with the basic knowledge and skills of CPR and the application of AED so as to enable them to act confidently and swiftly in a Cardiac Arrest/Heart Attack emergency situation.

e. **NUS Automated External Defibrillator (AED) Program.**

Since 2007, we have progressively equipped our campuses with AEDs and have guided the NUS Departments on the needs and installation of AEDs in their premises. OSHE will continue this programme to maintain NUS as a cardiac emergency prepared university

Highlights

334 life safety advisory and consultation sessions were provided by the staff from the Emergency Management Division.

In 2013, about 220 student leaders were trained in 13 runs of Safety & Crisis Management Planning Workshop for Student Leaders. 477 staff and students were trained in the live saving skills of 44 CPR & AED training sessions. Figure 12 below compares the level of participation in the two courses over the last three years.

The installation of AEDs in University Town had been completed.

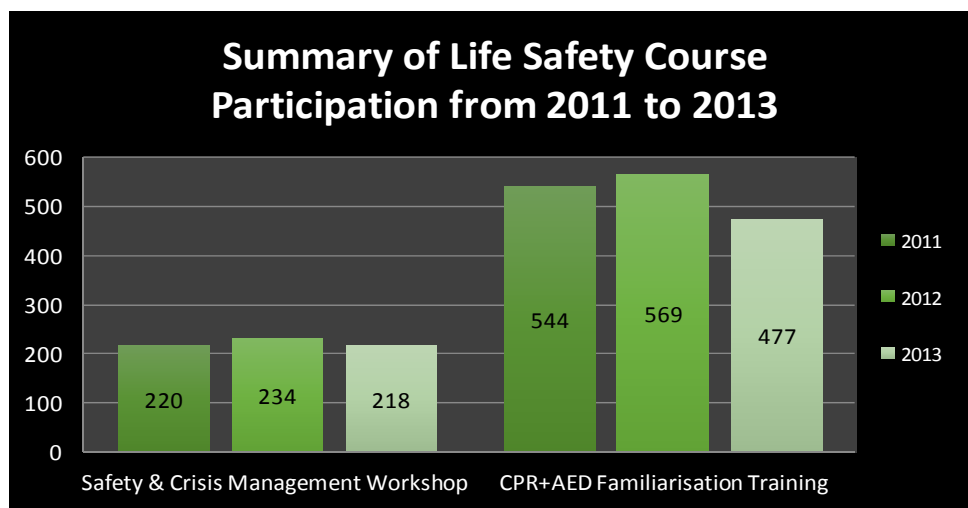


Figure 12 – Summary of Life Safety Courses Participation 2011- 2013



Mr Ravindran s/o Sockalingam
conducting CPR training



CPR training session in progress

Views of Our Stakeholders and Partners

“OSHE has been an integral part of the safety management and planning for most of Eusoff Hall’s events. We have been in constant consultation with the OSHE as early as the summer vacation even before the academic semester officially started”

- Tey Yi Shun (Mr), *Vice President, 26th Junior Common Room Committee, Eusoff Hall, National University of Singapore*

“Dear Ravi: You have truly played a big part ... and we feel more self-confident now. – STEER INDIA 2013.”

- Prof Rahul Mukherji, *FASS*

“That was a great sharing you provided, Ravindran. Thanks much!! – STEER CHINA 2013”

- Mr. Koh Chin Yee, *Director (Asia), Office of the Vice-President (University and Global Relations)”*

“I attended the CPR+AED workshop on 7 Jan and truly enjoyed the session. It was an enriching experience and the trainers were very engaging and knowledgeable and were able to deliver the lesson in an easy to understand and to remember manner. The trainers were also helpful and friendly and came round to help us correct our posture. I am glad to have the opportunity to attend it and offering it free and accessible to all students is great. Perhaps it might help if the training is publicized through faculty emails as many of my friends are not aware of such useful training available.”

- Kwok Mun Wai Serene, *Student, NUS Biz School*

“It was immensely helpful not only at work but also for our personal life. Honestly, I was expecting a whole chunk of technical theory with minimal hands-on training but I was proven wrong. It was interactive and interesting with the trainers often sharing personal experiences, and there were loads of hands-on practices (I can still remember the sore of my arms till this day)! I had benefited from this training... I will absolutely recommend this programme to others!”

- Mr. Cavin Teo Tat Wee, *Assistant Manager, Office of the Provost U-Town Management Office*

“Thank you very much for an excellent course very well taught. It was really well done. Thanks”

- Gary F. Bell, *Associate Professor, Fellow, Chartered Institute of Arbitrators, Faculty of Law, National University of Singapore*

“Thank you so much for taking the effort and time to organise such an important course for us. I thought it was really enriching and useful, good job OSHE!”

- Goh Wei Ling, *Director, ISE Camp Organising Committee 2013*

Dear Dr Peck

As Co-Chairs of the NUS Commencement Working Committee, we would like to thank you for the important and vital role played by your office in the planning, conceptualization and development of all the various plans necessary for Commencement 2013. In particular, we are grateful for the contributions of the following people from your office: Yam Guan Shyh and Ravindran s/o Sockalingam. Their professionalism and commitment have contributed much to the smooth execution and overall success of Commencement 2013. We look forward to working closely with you and your team on Commencement in the future. Thank you!

- A/P Ang Siau Gek & Ms Ovidia Lim , Registrar's Office & Office of Corporate Relations (13 Aug 2013)

Training our residential students to prepare for all kinds of emergencies and exigencies as well as to inculcate in them the ability to develop contingency plans is something truly precious. Eusoffian students run a wide range of activities from big construction projects for Rag float or Dance Production props and sets, to overseas expeditions to rural villages of Cambodia.

Anything can go wrong. The Emergency Management Division, OSHE especially Mr Ravindran Sockalingam, has over the years, developed a strong rapport with every successive generation of our student leaders.

As Hall Master then, I shared numerous briefing and training sessions with Ravi and I have learnt a lot from his professionalism and experience. And so have my students. These are the things that will stay with us for life: the situational awareness, the confidence and calm in the face of an emergency, to think how to avoid further problems and to act decisively mitigate the current problem. This is truly precious! Thank you OSHE!

I have found Dr Peck to be incredibly on the ball. Just take one example which happened some years ago.

For days, after the concrete drain cover at one of our faculty buildings was run over by a large vehicle and left in pieces. Nobody bothered to fix this hazardous situation. Anyone could have stepped into the hole and sustain multiple fractures and abrasions, or get impaled by the exposed protruding metal from the cracked reinforced concrete. To my good fortune, and my surprise, I saw Dr Peck walking the ground, and I signaled to him.

He walked over very briskly, and immediately saw why. A few hours later, I passed by and saw red and white warning tape around the place. Within a day or two, the concrete cover was fixed. I learnt from him that an Incident Commander must always be eyes and ears, always walking the ground, and not to passively wait for incidents to take place and respond reactively. This level of constant proactiveness was what I learnt from OSHE to apply it to my stint heading up Eusoff Hall and Biochemistry Department. Always be proactive, don't be too little too late.

Somebody's life may depend on it!

To all heads, if you as the CEO of the unit do not personally pay attention to safety, everyone down the line will not bother.

If you do so, then there is a chance for a safety culture at our workplace to succeed! I have seen Dr Peck personally in action and as the chief of OSHE, he certainly personifies this. And I have seen his staff, especially Mr Ravi Sockalingam follow his example of being proactive. This is certainly infectious. I too have become very much safety conscious and constantly encourage my staff and my students to adopt this mindset.

- A/Professor Tan Tin Wee, Master of Eusoff Hall (2003 - 2013) and Acting Head, Department of Biochemistry (2011 to 2012)

Dear Dr Peck

In recent years, NUS students have seen and benefited from greater outreach programmes by OSHE. ... it is clear that OSHE is truly committed to creating a better university environment for our staff and students.

Furthermore, the kindness and understanding shown by staff members in OSHE is extremely heartening. We have seen staff going beyond their duty to assist us in our programmes. A special mention goes to Mr Ravi from OSHE for tailoring courses to our busy student schedule, for his understanding and approachability, and for his quick help in times of urgency.

We are truly grateful for the inclusion of our student's perspective in your management philosophy. We believe that the work you do would go a long way in making NUS a better institution for all.

- Tan Wei Yuan (Mr), President | 33rd Management Committee, NUS Students' Arts and Social Sciences Club (13 Jan 2014)

Fire Safety

The key role of Emergency Management Division in Fire Safety is to provide comprehensive fire safety advisory, consultation and training to our stakeholders, to ensure that NUS complies with all the fire safety regulatory requirements and to enhance the high fire safety standards in NUS.

The following program and specific responsibilities are undertaken by the team in pursuit of Fire Safety Excellence in NUS:

a. Fire Safety Training

The full spectrum of scheduled, ad-hoc and on request, classroom, onsite and practical fire safety education courses and trainings are provided for general staff and students. Specialist training is catered for Fire Wardens and Fire Coordinators.

b. Fire Drills and Exercises

The team facilitates all regulatory fire drills and ensures regulatory requirements are fulfilled by all units. The team also coordinates, engages and facilitates joint exercises between critical facilities and SCDF.

c. Fire Safety Monitoring and Consultation

False alarms cause disruptions and inconveniences to the building occupants and this may lead to the community losing confidence in the building fire alarm, protection and evacuation systems. OSHE monitors the occurrence of false fire alarms and works together with the Office of Facilities Management (OFM) to identify root causes and implement rectification measures.

Fire safety issues are reviewed at the design stage for new building projects. Face-to-face consultations are held with various stakeholders and partners. Here, OSHE provide advice to address their fire safety concerns in buildings and A&A renovation works.

d. NUS Building Fire Safety Compliance Inspections

Fire safety inspections of all buildings are conducted as part of the overall effort to drive and maintain compliance to fire safety regulations. Such inspections also help to build a positive fire safety culture.



Mr. Mohammad Fazulee Bin Abdul Rahman, OSHE Staff helping participant to use the fire extinguish to put off the fire during the fire safety training



A participant learns how to use a fire blanket to put off the fire during the fire safety training

Highlights

50 scheduled courses and trainings and 72 unscheduled / on-request courses and trainings were conducted in 2013. In total, 5200 staff and students were trained.

Year	Fire Safety Training (no of pax)					Total
	Fire Safety Education	Fire Warden	Fire Coordinator	Fire Safety Refresher	Other fire safety training	
2011	900	357	61	249	2071	3638
2012	595	303	87	189	2824	3998
2013	1058	341	23	185	3660	5267

Table 9- Number of On-Site ad-hoc Fire Safety Training Courses conducted over the last three years.

An online Fire Safety Awareness Training was introduced in March 2013. All staff were required to view the on-line module and take a simple test. All 8,900 staff completed the training by August 2013. Starting from 2014, all new staff would be required to attend this online training as part of the New Staff Orientation administered by the Office of Human Resources.

A new *Fire Safety Awareness Programme for New Students* at the faculty level was introduced in August 2013. Our team conducted “Train-The-Trainer” sessions to train the faculty fire safety representatives to be effective trainers for this fire safety awareness programme. These trainers would subsequently conduct the fire safety awareness presentation to all their new students at the beginning of each semester.

The annual NUS Building Fire Safety Compliance Inspection was carried as in previous years. In 2013, a total of 96 buildings were inspected. 95 of these buildings were jointly inspected with SCDF in Q4 2013. This gave us an opportunity to further enhance the fire safety standard in NUS. There were many lessons learnt and improvements have resulted in higher fire safety standards.



Hall Night Fire Drill



VIPs at OSHE Fire Fusion



Fire Safety Excellence Award –
Platinum Award winners

The Building Fire Safety Excellence Award Program, which takes into account the results of the building fire drill, the building fire safety compliance inspection and the operational readiness of the building fire safety committee continues to raise the standard of fire safety readiness across the University. The Departments / Building owners have taken the challenge positively and are striving to reach their desired goal.

It is evident (Table 10) that the numbers of buildings in the higher award categories of Platinum and Gold in the Building Fire Safety Award Program had increased markedly and stabilized especially over the last two years. There is also an increase in the “No Award” category because of the standard for the awards are reviewed and raised annually since 2010.

Award	WY2008		WY2009		WY2010		WY2011		WY2012	
	No.	%	No.	%	No.	%	No.	%	No.	%
Platinum			-	-	7	8%	29	31%	29	30%
Gold	23	29%	52	58%	39	43%	27	29%	24	25%
Silver	11	14%	4	4%	14	16%	11	12%	5	5%
No Award	44	56%	34	38%	30	33%	26	28%	38	40%
Total	78	100%	90	100%	90	100%	93	100%	96	100%

*Table 10 - NUS Building Fire Safety Excellence Award from WY 2008 to WY 2012.
(The result for WY2013 would only be released in March 2014.)*

The team monitored closely the 163 occurrences of false fire alarms on campus. Working together with the Office of Facilities Management (OFM), key causes of the false alarm cases were identified and a systemic approach was taken to reduce the recurrences of false alarms.

Management and facilitation of fire incident investigations. The team provided consultation, guidance and facilitation in 17 fire incidents to the faculties and units in their fire investigations.

A summary of the activities carried out under the fire safety program is given in Table 11.

The amount of effort placed in fire prevention is increasing. The number of staff and students trained in fire safety is the highest since 2011 (this excludes the mandatory fire safety awareness training for all staff and new students). The number of unannounced fire drills and fire safety compliance inspections have also increased. Despite these efforts, the number of fire incidents is also the highest over the same period of time. Fortunately, these fires were detected quickly and extinguished. A number of these incidents were due to electrical fires. OSHE and OFM are working together to identify and address systemic issues e.g. quality of switches.

NUS Restricted

Fire Safety Training Courses	2011		2012		2013	
	No. of Courses	No. of Pax	No. of Courses	No. of Pax	No. of Courses	No. of Pax
- Fire Safety Education	26	900	18	595	34	1015
- Fire Warden Training	15	357	13	303	12	341
- Fire Coordinator course	3	61	5	87	2	23
- Fire Safety Refresher Course	10	249	11	189	10	185
- Fire Extinguisher Practical Only	0	0	0	0	11	780
- Other Fire Safety Training	83	2071	57	2824	53	2923
Total	137	3638	104	3998	122	5267
Fire Drills & Exercises						
- Announced	95		81		73	
- Unannounced	9		28		39	
Total	104		109		112	
Fire Safety Compliance Inspections						
- Announced inspection	91		96		70	
- Unannounced inspection	0		10		4	
- Re-inspection	2		2		1	
- SCDF Enforcement Checks	0		0		95	
Total	93		108		170	
False Fire Alarms						
Total	151		183		163	
Fire Incidents						
Total	2		5		17	

Table 11 - Summary of the activities undertaken in the fire safety program

Views of Our Stakeholders and Partners

“Sheares Hall would like to put on record its gratitude to OSHE EM for all its assistance and support throughout 2013. Through their help in meaningful exercises like fire drills and other emergency preparedness exercises, Sheares Hall has been able to ensure the safety and wellbeing of its residents. OSHE EM’s guidance was also invaluable in helping Sheares Hall prepare for the recent fire safety inspection by the Singapore Civil Defence Force. We look forward to another year of close cooperation with OSHE EM.”

– Kwek Qi Qi, Sheares Hall Manager

“Kent Ridge Hall will like to express our sincere appreciation to OSHE EM for their outstanding support and guidance over the past year. With OSHE EM’s help, we have succeeded in ensuring a safer and healthier environment for all our hall residents and staff in 2013. In the new year, we will continue our strong commitment towards emergency preparedness and strive towards having a closer integrated partnership with OSHE EM.”

– Kelvin Goh, Kent Ridge Hall Manager

“On behalf of Temasek Hall, I would like to show appreciation to OSHE EM Division which had assisted Temasek Hall for the past year in Fire Safety matters. The officers have always provided professional advices to keep and promote the high-safety level in our premises. With their kind assistances and support, the fire drills have been successfully conducted bi-annually. Education of safety and risk management has been given to student leaders for the activities. I would also like to thank for the full support by conducting the safety talk during the freshmen orientation camp since the first invitation in year 2011.”

– Low Cheng Hong, Temasek Hall Manager

“I would like to thank you (Adam) for conducting a session on Fire Safety and the associated hands-on session to the RVR student mentors on 8th June 2013 Saturday. Through your detailed elaboration, the student mentors have learnt a lot about fire safety and how to react should the need arise. The examples you have shown and the personal experiences you have shared have had a great benefit on us, making us aware of the seriousness of a fire and the need to do or avoid certain actions during such an emergency. The hands-on session was extremely useful, and we learnt how to use the fire extinguishers and hose properly. The morning at OSHE was certainly an informative workshop with fruitful hands-on activities for my student mentors. I appreciate your great patience and the guidance in delivering the precious knowledge to all of us. I look forward to having your next talk for the freshmen orientation in August 2013.”

- A/P Tay Seng Chuan, Warden, Ridge View Residences

“My team has benefited much from OSHE, EM team in their guidance & support in formulating and implementing safety programs for the school. Among many noteworthy programs are the Fire Safety program & Pandemic control program. I look forward to many other working opportunities with OSHE, EM in maintain a positive safety culture in NUS.”

– Lauren Ng Mui Keow, School of Medicine’s Deans Office

"We like to take this opportunity to thank your team members for their patience in our numerous calls especially during the recent SCDF inspection exercise and not forgetting our annual fire drill and inspections. We agree that we must be vigilant in this aspect especially in a high density user space like our libraries where safety of all occupants is the top priority."

- Kan Sok Cheng, Associate University Librarian, Science Library

"What makes the whole exercise of fire safety and emergency exercise part and parcel of our work is because OSHE whether yourself or your team - Fazulee and Adam are quite open when they observe the conduct of fire drill or when they perform building audit. I think you all have done well in conveying the awareness and preparedness of staff through OSHE's involvement and receptivity to listen to the participants thus removing the barrier of strict compliance. Working with OSHE many years now has always been a breeze as they will come in at the right time to give us the necessary support. We were never stumbled as the actual exercise unexpectedly turned out better than our preparations. And after the series of activities leading to the fire safety award application, we were glad to be incentivized when we won the award and all the fire wardens were rewarded as well. Thank you for the generosity."

- Tan Lay Tin, Associate University Librarian, Hon Sui Sen Memorial Library

Dear Dr Peck, Lau, Adam, Fazulee

Thank you so much for all the help, advice and hard work that you gave to SDE as we prepare for SCDF's fire safety inspection. The inspection went smoothly today, and this is in a large part due to your contributions. Please accept SDE's sincere and grateful thanks.

- A/P Florence Ling, Vice Dean, SDE

Business Continuity Management

The NUS Business Continuity Management (BCM) effort seeks to identify the critical business functions of the university and prepare the departments responsible for these functions to be able to continue to operate and provide such services when the normal operations are severely disrupted after a disaster. OSHE provides professional guidance and acts as a facilitator to coach, guide, facilitate and monitor the departments / offices / units in identifying the need to have a Business Continuity Plan (BCP), develop a BCP, fulfilling the preparation and training of the staff and the unit, and finally to be BCP Ready.

Highlights

All identified units in the four clusters, namely Academic, Administration, Research and Enterprise, have completed their respective BCPs and are BCP-ready. The Academic (13 faculties) and Administration (12 offices/units) clusters have also completed their annual review and conducted their BCP exercise.

Views of Our Stakeholders and Partners

"We have benefitted a lot from your team's guidance in conducting table top exercises to test our BCP for a fire scenario and setting up an offsite office for both the Medical and Science Libraries. We gained lots of insight in planning and a better understanding the work that is required in handling a crisis and we believe we are better prepared now."

- Kan Sok Cheng, Associate University Librarian, Science Library

"Dear Mr. Yam

These (BCP) exercises are particularly useful to occasionally have OSHE around to listen in and offer pointers on areas we may have missed, to allow us to remember better and be better informed of the University's directives. For instance, when emergency happens, the CEM team from NUS will be activated to go to the site. The guidelines provided by OSHE are very clear. The annual update to the BCP manual is also useful to ensure readiness among staff. It was tedious but we all benefited and find it less daunting now."

- Tan Lay Tin, Associate University Librarian, Hon Sui Sen Memorial Library

International Collaborations

In 2013, OSHE hosted international visitors to our campus, who were interested to know more about NUS safety and health programmes and the role of OSHE in raising safety standards and culture on campus. OSHE also organized visits to the departments and laboratories for them to see safety programmes in action. Below is a summary of key visits:



5 February 2013 – a team from the Indian Institute of Technology, Gandhinagar

7 & 8 March 2013 - a team from the Environment, Health & Safety Office (EHSO), Massachusetts Institute of Technology (MIT)



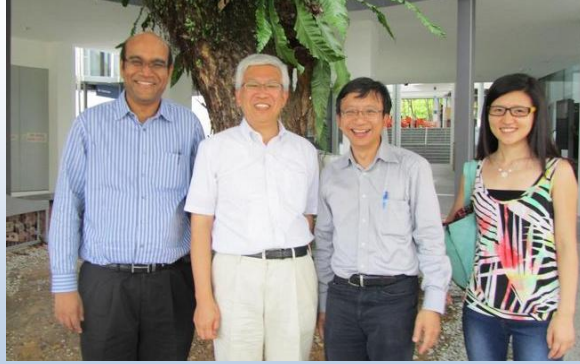
25 & 26 March 2013 - a team from the Office of Safety, Health & Environment, Universiti of Brunei Darussalam (OSHE-UBD)



3 June 2013 - a team from Universiti Kebangsaan Malaysia



15 October 2013 - a team from University of Tokyo



18 Oct 2013 - Prof Toshiro Tanaka and Prof Ruth Vergin (not in photo) from Ehime University, Japan



A delegation from the Education Faculty Disaster Association (EDUFA), Korea visited OSHE on 7 Dec 2013

4. Quality & Services

Awards for Service & Quality Improvement



Ms Oh Siew Kee and Dr Tessy Joseph receiving the Award from Singapore Productivity Association

The Learning Institution's Quality Conference (LIQC) Awards

OSHE participated in The Learning Institution's Quality Conference (LIQC) in Nov 2013. OSHE shared their Innovation & Quality (IQ) Team's project on "Electronic Certification of Structured Safety Training System (SSTS)". Our team adopted Lean Six Sigma principles to develop a seamless way of delivering SSTS certificates.

This project was conferred the "**Best Impact on Productivity Award**" for the huge productivity improvement achieved.

The team was also awarded the **Silver Award** for their presentation on the same project at the conference.

Staff Award

The Singapore-MIT Alliance for Research and Technology and Environment and Environment, Health and Safety Office of MIT presented a token of appreciation to Dr Lim Cheh Peng for her contributions to SMART safety and health programmes, in particular to the SMART IBC.



Mr Saravanan Gunaratnam, Head, Safety & Health Management Division, OSHE presenting the token of appreciation to Dr Lim Cheh Peng on behalf of MIT



Dr Peck Thian Guan receiving award from Prof Yong Kwet Yew, Office of the Vice President (Campus Infrastructure)

Outstanding Voice Participation Award 2013

OSHE was awarded the 3rd prize for the Outstanding VOICE Participation of the Year Award 2013 (for Departments with more than 25 staff).

Feedback Rating (5 point scale)

SURVEY (RATING SCORE: 1: STRONGLY DISAGREE TO 5: STRONGLY AGREE)	AVERAGE RATING IN 2013
<u>ADVISORY</u>	
THE OSHE STAFF WAS KNOWLEDGEABLE AND COMPETENT	4.26
THE OSHE STAFF WAS FRIENDLY AND POLITE	4.43
THE OSHE STAFF WAS TIMELY IN RESPONDING TO MY QUERIES	4.35
THE ADVICE PROVIDED WAS USEFUL	4.33
AVERAGE	4.34
<u>LAB INSPECTION</u>	
THE OSHE STAFF WAS KNOWLEDGEABLE AND COMPETENT	4
THE OSHE STAFF WAS FRIENDLY AND POLITE	4
THE OSHE STAFF WAS ABLE TO COMMUNICATE THE INSPECTION FINDINGS CLEARLY	5
GOOD TIME MANAGEMENT BY OSHE STAFF	4
THE INSPECTION HAD HELPED ME IMPROVE MY SAFETY PERFORMANCE	4
AVERAGE	4
<u>FIRE SAFETY INSPECTION</u>	
INSPECTION SERVICES	
THE OSHE STAFF WAS KNOWLEDGEABLE AND COMPETENT	4.28
THE OSHE STAFF WAS FRIENDLY AND POLITE	4.28
THE OSHE STAFF'S ADVICE WAS HELPFUL	4.28
THE INSPECTION WAS CONDUCTED IN A TIMELY MANNER	4.17
THE INSPECTION HAD HELPED ME IMPROVE MY FIRE SAFETY STANDARD	4.28
AVERAGE	4.26
<u>AUDIT</u>	
LEAD AUDITOR	
THE OSHE STAFF WAS KNOWLEDGEABLE AND COMPETENT	4.63
THE OSHE STAFF WAS FRIENDLY AND POLITE	4.65
THE OSHE STAFF WAS ABLE TO COMMUNICATE THE AUDIT FINDINGS CLEARLY	4.67
GOOD TIME MANAGEMENT BY OSHE STAFF	4.4
THE OSHE STAFF ENCOURAGES PARTICIPATION FROM THE AUDITEES	4.63
OVERALL, THE LEAD AUDITOR WAS EFFECTIVE	4.71
AVERAGE	4.62
<u>THE LABORATORY CERTIFICATION PROGRAMME</u>	
INFORMATION ON THE SCHEME IS READILY ACCESSIBLE	3.98
THERE WAS SUFFICIENT TRAINING AND GUIDANCE FROM OSHE TO DEVELOP AND IMPLEMENT	4.06
THE SCHEME ENABLED ME TO BETTER MANAGE THE SAFETY AND HEALTH RISKS AND	4.35
THIS SCHEME RAISED SAFETY & HEALTH STANDARDS IN MY LAB	4.23
AVERAGE	4.15

5. Conclusion

In the context of Safety and Health, 2013 was a good year for OSHE. The number of accidents and incidents for staff and students are on a downward trend and was the lowest in 2013. This can be attributed to a comprehensive range of safety & health programs that had been in place for a number of years and the unwavering effort by the entire NUS community, in particular, the NUS Senior Management, Deans, HODs, Pls, safety & health committees and safety leads in rigorously implementing and enforcing the safety & health system and the unit incident commanders and the unit incident crisis committees in doing their part in crisis and emergency management.