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SAFETY CASE

- a journey worth every effort



Bernard Leong
HSE



Participants of the joint study mission to Europe (government agencies, union, industry).

What is Safety Case ?

A Safety Case *written presentation* is commonly presented using (and communicated through) a structured set of documentation that focuses on how major accidents are prevented at Major Hazard Installations (MHI), and how the consequences to people and the vicinity are limited.

MHIs comprise petroleum refining facilities, petrochemical manufacturing facilities, chemical processing plants and installations where large quantities of toxic and flammable substances are stored or used.

MHIs are covered by the *Workplace Safety and Health (Major Hazard Installations) Regulations* which came into operation from 1 September 2017. In it, the *occupier* (company) of a MHI must take all measures necessary to reduce the risk of major accidents to *as low as reasonably practicable* (ALARP) and to limit the consequences of major accidents.

Background

The core feature of the Regulations is the Safety Case Regime. This regime allows flexibility for MHIs to tailor their risk

mitigating measures, enabling MHIs to address their risk in a more holistic manner.

The development of the Regime was with close collaboration of regulatory authorities, led by Ministry of Manpower (MOM), and the industry, led by Singapore Chemical Industry Council (SCIC).

As early as 2013, HSE Manager, Er. Bernard Leong LW, participated in the MHI Study Mission, led by MOM. The tripartite (government agencies, union, industry) study mission to Europe was to understand the framework on the management of MHIs in the context of Seveso II/III Directives¹.

Among the broad learning areas were:

- (i) enhance MHI regulatory regime in Singapore
- (ii) coordinate efforts and promote cooperation among MHI stakeholders
- (iii) drive MHIs to manage overall HSE risks in a more holistic manner
- (iv) challenges faced by stakeholders in implementing Seveso II/III Directives

The Major Hazards Department (MHD) was established in September 2016, as

a joint-government department led by MOM and comprises officers from MOM, National Environment Agency (NEA) and Singapore Civil Defence Force (SCDF). MHD's objective is to be a single regulatory front for Safety Case assessment and site verifications.

The key activities for the Safety Case are:

- (i) Pre-receipt meeting
Alignment of company's approach to develop Safety Case
- (ii) Submit Safety Case
Receive MHD's conclusions of the Safety Case assessment
- (iii) Act on Safety Case conclusions
Risk controls described in Safety Case are implemented, action items in Proposed Intervention Priorities (PIP), Intervention Plan (IP) and Revision Plan (RP) are completed
- (iv) Review Safety Case
Significance of changes in the workplace on the prevention and mitigation of major accidents is assessed; risks arising from changes are addressed

Note 1: In Europe, the catastrophic accident in the Italian town of Seveso in 1976 prompted the adoption of legislation on the prevention and control of such accidents. The so-called Seveso Directive (Directive 82/501/EEC) was later amended in view of the lessons learned from later accidents such as Bhopal, Toulouse or Enschede resulting into Seveso-II (Directive 96/82/EC). In 2012, Seveso-III (Directive 2012/18/EU) was adopted taking into account, amongst others, the changes in the Union legislation on the classification of chemicals and increased rights for citizens to access information and justice.

PCS' Journey

PCS' journey began in September 2016, with the formation of the *Safety Case Development Organisation*, comprising the *Safety Case Steering Committee*, headed by General Manager (Plant), Er. Lucas Ng HK, and Workgroups to handle Bow Tie/ALARP and Quantitative Risk Assessment (QRA).

At the onset, PCS' Management vision was to develop the Safety Case wholly with internal resources, and only drawing on the expertise of a consultant for the QRA. Even so, PCS members were actively involved in the QRA process, providing feedback and interacting with the consultant.

The first step was in developing competency and capability in Safety Case. All the members of the Safety Case Development Organisation went through the Safety Case Knowledge-Building Workshop and Safety Case Practitioners Workshop, organised by SCIC. In addition, specific skills workshops were organised internally (facilitated by subject matter experts) for Bow Tie and ALARP demonstration.

Bow Tie method is a risk evaluation method that can be used to analyse and demonstrate causal relationships in Major Accident Scenarios (MAS). The method takes its name from the shape of the diagram, which looks like a bow tie. A Bow Tie gives a visual summary of all plausible accident scenarios and identifying control measures to control those scenarios.

At the core of ALARP is the concept of "reasonably practicable", involving weighing a risk against the trouble, time and money needed to control it. ALARP describes the level to which workplace risks are controlled.



OSV discussion between MHD officers and PCS' Safety Case Development Organisation.

PCS' Safety Case development schedule

The schedule for the development of the Safety Case was first formulated in September 2016, with target completion in September 2017, as indicated by MHD for those companies considered under "Phase 0". With PCS being informed later on that its Safety Case is due in September 2018 (Phase 2), more time was available to spend on further reviewing documentation, including preventative and mitigative actions.

This has allowed PCS to be better prepared for the Safety Case *Pre-Receipt Meeting* on 7 March 2018, the first engagement session with MHD.

At the Pre-Receipt Meeting at MOM's premises, PCS was represented by the full-force of the Steering Committee, led by HSE Manager. PCS presented the workflow from identification of Major Accident Hazards (MAH) and Major Accident Scenarios (MAS) up to the selection of Safety Critical Events (SCE).

MHD noted the good presentation in PCS' sample write-up on accidents/incidents reviewed and the actions taken. MHD also noted that the ALARP demonstration was organised and structured, including consideration of "what more can be done" and how a simple benefit-effort assessment was done to arrive at an informed decision to accept or reject a risk reduction measure.



Safety Case Written Presentation documents.

MHD acknowledged that PCS' preparation (at that time) was already at an advanced stage and noted the bulk of the work was done with its own resources. There was initial apprehension from MHD, but PCS members, as a team, demonstrated what PCS is capable of. MHD was impressed with PCS' organisation and schedule, and emphasised that the Safety Case written presentation serves as knowledge retention and for succession planning.

Subsequent step was to proceed with the rest of the Bow Tie and ALARP for the SCEs (after MHD endorsed PCS' methodology) and tidy up the documents, in preparation for the complete *written presentation* submission by the deadline of 1 September 2018.

Not wanting to cast doubts on PCS' capability, as some companies requested for extension of their deadline, members worked feverishly to ensure all required documentation have been compiled and the *written*

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The penultimate phase was the On-Site Verification, which took place on 10 & 11 April 2019. At the conclusion of the meeting, most of the observations and recommendations that MHD made were not critical to PCS' Safety Case. These can be deferred to future Intervention Plan, targeted yearly, although may be less frequent depending on MHD's workload.

At that meeting, MHD mentioned that one of the things they look out for is "workforce participation", and in this area, PCS passed with flying colours. PCS group of 28 members, led by GM (Plant) surpassed their largest group of 16. They also thanked PCS for the smooth flow of the OSV and the cooperation from all involved. GM(Plant) mentioned that it is part of PCS' culture of open-sharing, and joint "learning journey" with MOM.

presentation is, to the best knowledge and effort, essentially complete. The submission of PCS' Safety Case to MHD was on 27 August 2018, consisting of 2 nos. Main Document files and 6 nos. Appendix files, plus a CD-ROM of the contents.

Following the submission, MHD requested for an Early Predictive

Screening (EPS) visit on 12 February 2019. This is an additional phase, inserted later on, to discuss on predictive aspects and technical demonstration, and whether PCS' Safety Case have provided sufficient information with respect to technical areas to make the necessary demonstration, as MHD noted that some companies were not fully prepared for the On-Site Verification (OSV) phase.



All smiles at the end of the Conclusion Meeting.

Takeaways

The Safety Case was completely developed and prepared with in-house resources and expertise. The only exception being the QRA. PCS Management believes in total ownership of the Safety Case, and have, from the start, planned to develop with in-house resources. There were no additional resources, and all personnel involved in the Safety Case hold their own roles and responsibilities within the company.

Within each Safety Case element, a core group of the Function's staff, consisting of engineers and operational staff, work and contribute to that element.

Management believes such hands-on involvement serves well to develop its own workforce, to not only appreciate the hazards and scenarios, but also their consequences. Aside from these, the compilation of these documents also serves as knowledge retention and succession planning.

Functions use relevant portions as awareness and refresher training, in developing and sustaining staff competency. In dispelling complacency, and the culture of *chronic unease*, the portions on past incidents and learning lessons, are being used.

Licence to continue operation

The culmination of two and a half years' worth of effort was in the final phase, where a Conclusion Meeting was held on 12 June 2019. The meeting, more of a formality, as PCS have accepted MHD's Intervention and Revision Plans, signalled the completion of the Initial Submission of the Safety Case written presentation.

MHD's Director, Er. Go Heng Huat, noted PCS submitted its written presentation ahead of the deadline, and was well prepared. MHD noted PCS' emphasis and attitude on ownership of the Safety Case, "if I think of good attitude, I will think of PCS", quoting MHD's Deputy

Director, Ms. Jaime Lim. MHD was also impressed with PCS' approach to Human Factor/Task Analysis, which no other company, to date, have demonstrated.

With this, the next lap has begun, which is, ensuring the Safety Case Written Presentation remains a "live document", valid and reflecting current situation. The document is also to be used as knowledge management and retention, and competency development.

It is with this in mind, GM (Plant) had the foresight to develop a sustenance framework, with options to ensure the documents are not left on the shelf to gather dust.

WSH 2028



Bernard Leong
HSE

Singapore aims to be one of the safest workplaces in the world by the year 2028, with the target of fatality rate of less than 1.0 per 100,000 workers. In 2018, Singapore's 3-year average fatality rate was 1.4 per 100,000 workers, or 7th position among the Organisation for Economic Co-operation and Development (OECD) countries.

Building on the foundation of WSH 2015 and WSH 2018, the WSH 2028 Tripartite Strategies Committee have presented three (3) strategies and seven (7) recommendations for the next ten years in realising the vision, "A Healthy Workforce in Safe Workplaces; A Country Renowned for Best Practices in Workplace Safety and Health", which the Ministry of Manpower have accepted.

These were on the back of over a year's deliberation and 28 engagement sessions with close to 3,000 stakeholders.

The 3 strategies are:

- 1. Strengthen WSH Ownership** - the level of ownership for Workplace Safety and Health (WSH) by all stakeholders has to move beyond "basic" to be global-leading for sustained improvements in WSH.
- 2. Enhance Focus on Workplace Health** - a healthy workforce is the outcome of a safe workplace. At the same time, a healthy workforce is also a contributor to safety.
- 3. Promote Technology-Enabled WSH** - there is immense potential for the practice of WSH itself to be transformed through technology.

The recommendations toward achieving these outcomes seek to shift employers' mindsets in two key ways.

Firstly, to shift from thinking that WSH is a cost that they need to minimise, to the conviction that good WSH is good for business.

Secondly, to shift from thinking that workers' individual health is not the employer's responsibility, to the belief that employers can and should create work environments conducive for good health.

Singapore has come a long way since it first enacted the WSH Act in 2006. Back then, punitive measures largely drove compliance by businesses to regulations. In recent years, there is a strong tripartite partnership (government, employers, unions) to actively promote, educate and recognise good WSH practices.



**A Healthy Workforce
in Safe Workplaces;
A Country Renowned
for Best Practices in
Workplace Safety and
Health**

WSH 2028
TRIPARTITE STRATEGIES
COMMITTEE
April 2019

Strategies	
1. Strengthen WSH Ownership	<i>Key recommendations:</i> 1.1 Make WSH more salient in business decisions 1.2 Align company directors and top management to WSH ownership 1.3 Strengthen WSH ownership of workers
2. Enhance Focus on Workplace Health	<i>Key recommendations:</i> 2.1 Expand occupational disease prevention efforts 2.2 Build companies' capabilities to promote workforce health
3. Promote Technology-Enabled WSH	<i>Key recommendations:</i> 3.1 Develop a WSH technology ecosystem to deepen industry capability 3.2 Strengthen WSH training through technology

The table summarises the 7 recommendations for the 3 strategies.



BBS TRUsT Champion Training



Alfian bin Zolkipli
F&S

Behaviour Based Safety (BBS) Champion Concept was introduced in 2007. It was reviewed in March 2009 to broaden and spread Function Capacity Building to shop-floor personnel with Champions taking up key role in educating and ensuring safe behaviour within their Functions



BBS Facilitator Alfian kicked off the day's training at Oasia Hotel @ Novena with an opening speech. He highlighted that MOM has embarked on the total WSH programme which is a holistic and integrated approach to manage the interactions between work, safety and health, so as to promote the well-being of workers and employers. He also touched on Vision Zero Movement, which has been launched to help inculcate that all injuries and ill-health in the workplace is preventable and that zero-harm is possible.

During the training, HSE Safety Officers, Chua Eng Seng and A. John briefed the members on the journey of BBS and its history in PCS. They coached the incoming Champions on the various aspects of making good BBS observations, the pitfalls and the common mistakes involved when filling up the BBS observation cards, with its 21 Critical Behaviour Inventory and different at-risk scenarios. The training session was comprehensive covering topics ranging from:-

- ➔ BBS introduction in PCS,
- ➔ BBS TRUsT Champion Concept,
- ➔ Role of BBS Champion,
- ➔ The Art of Giving Effective Feedback and
- ➔ Quality BBS Submission, video viewing and practical exercises.

This year, the training was different as there was a seating arrangement to mix all Functions at each table for better cross function interactions, assisted by a Steering Committee member. The training material was more comprehensive and well prepared. Thanks to Ms Lilian Tang for making all these possible.

A new CBI, 7.1 Wellness, was also introduced during the training. It falls under chapter 7, Health to be in line with the Total WSH programme. The new CBI entails an observable sign and visible symptoms of an unwell person when conducting a BBS

observation. An unwell person constitutes a risk when he/she is carrying out a task and by identifying an unwell person, due action can be taken to schedule a short rest or refreshment before continuing the task.

Things to observe when conducting an observation

1. Is the person coughing badly while carrying out the task?
2. Does the person appear sick-face and lips appear pale?
3. Is the person working in pain?
4. Does the person looks distracted when doing the task?

Example

1. When tightening the nut, he was coughing badly and had to stop work a few times.
2. When carrying the scaffold, his face appears pale and he bends his back often to rest.
3. When walking, he appears to be limping and in pain.
4. When working at elevated platform, he appears dazed and fatigued.

At the end of the day, the new Champions were presented with a small momento in the form of a magnet and badge to remind them of the role they will carry out.



BBS TRUsT Champion Award - 2019



Loh Sing Keong
HR & Admin

BBS TRUsT Champions play a key role in educating and promoting safe behaviour among employees and contractors. Besides promoting and carrying out BBS observations, BBS TRUsT Champions also prepare and share Quality BBS Submissions (QBS).

Recently, the BBS TRUsT Steering Committee had selected Md Amin from HR & Admin as the "Champion" of BBS TRUsT Champions out of the 15 Champions

appointed from the various shift teams, functions and contractor representative. Md Amin has been a BBS TRUsT Champion for the past 6 years. This award is to recognise Md Amin's dedication, unwavering support and consistence effort in promoting BBS TRUsT and sharing high quality QBS.

Presenting the award on 27 June 2019 at PCS Admin Building, GMP Lucas Ng congratulated Md Amin saying, "This year

marks the 15th anniversary of BBS TRUsT which is the cornerstone and pillar of PCS safety culture. It is an achievement. PCS will continue and sustain in this safety journey because of the passion and commitment of our employees, especially the BBS TRUsT Champions."



GMP Mr Lucas Ng presenting the best of BBS TRUsT Champion award to Md Amin.



Smiling HR & Admin members proudly shared the happy moment with Md Amin.

NTUC May Day Award 2019 - Plaque of Commendation Award (Gold)



Cerine Lim
HR & Admin

The first Collective Agreement (CA) was established on 1 July 1989 between PCS and SPCEU and subsequently renewed four more times. On 1 February 2001, a merger between SPCEU and UWPI took place. This was led by the former General Secretary of SPCEU, Mr K Karthikeyan, who is the current General Secretary of UWPI. After the merger of SPCEU and UWPI, the last six CAs with PCS were under the care of UWPI.

UWPI grew its union membership strength in PCS from about 100 members in 1986 to about three times that number today. The mutual trust established between PCS and UWPI has resulted in more than 360 industrial relations monthly meetings over the years.

Both UWPI and PCS ensure a harmonious industrial relation exists, constantly preparing the workforce for the future of the oil and gas industry. This also helps PCS to remain competitive and sustainable amidst the fierce competition in the region.



The NTUC Central Committee, with the strong recommendation of NTUC Oil, Petrochemical, Energy and Chemical Cluster (OPEC) and United Workers of Petroleum Industry (UWPI), has conferred the Plaque of Commendation Award (Gold) to PCS for its continuous support and contribution towards good labour-management relations, workers' welfare and NTUC initiatives. NTUC Secretary-General Mr Ng Chee Meng presented the

award to PCS Managing Director Mr Akira Yonemura, during the NTUC May Day Awards ceremony held on 3rd May at the NUS University Cultural Centre.

A bipartite labour-management relationship was founded on 6 August 1986 when PCS was unionized by the Singapore Petrochemical Complex Employees Union (SPCEU). Over the years, a strong, trusting and stable relationship has developed.





Safety Case Symposium 2019

Singapore March 26 - 27, 2019



A. John
HSE



Er. Lucas Ng presenting during Safety Case Symposium.

Sustaining Safety Case "Live" Status:

- ✓ Should treat safety case written presentations beyond regulations, as "live" documents accessible by all those who need to understand the demonstration of ALARP before operating the installation
- ✓ Have to be updated accordingly for any significant changes made to the MHI in ensuring that they reflect the present day status
- ✓ Changes made have to be documented and communicated to the affected workforce



Participants listening attentively to the presentation.



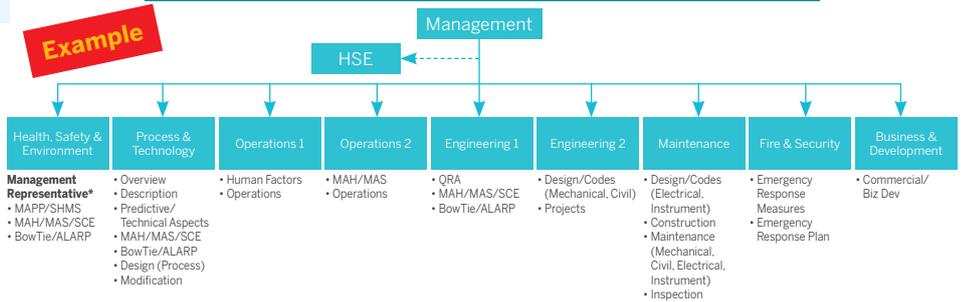
Er. Lucas Ng answering questions from participants.

The key objective of the Safety Case Symposium is to provide a dedicated platform where global stakeholders of safety cases convene to engage in sharing, learning, and discussion on Safety Case related topics. It also aims to establish the network of stakeholders in the industry for successful implementation.

The second international "Safety Case Symposium" themed **'Technologies, Methodologies, and Regulations'**, which was held in Singapore from 26 to 27 March 2019, had gathered 27 speakers and more than 260 participants with different stakeholders from 16 countries.

Participants including four PCS members had the opportunity to hear from various speakers with different stakeholders on a wide range of topics such as Certification Bodies, Regulators, Standard Development Bodies, Research Institutes and many more including PCS General Manager (Plant), Er. Lucas Ng HK who presented on the topics "Let's Prepare Safety Case Written Presentations in Sustaining "Live" Status". In his concluding slides, he elaborated on various options to use Safety Case written presentation to keep the "Live" status which includes:

For a Successful Safety Case Development Organisation



Er. Lucas Ng with Dr. Foo Swee Cheng (NUS) networking with participants.



PCS participants Ho Jia Quan, Lionel Cai, A. John and Guo Kang Hui.

- ➔ Dedicated webpage "menu" access for "ease of access"
- ➔ Hardcopy print at each department for "ease of access"
- ➔ Discuss "one topic" during HSSE management committee meeting (e.g. quarterly)
- ➔ Departmental monthly "subject matter expert" small group discussion
- ➔ Departments assign a "focal point" to review and present at staff meeting
- ➔ Departmental monthly "lesson learning" session
- ➔ HSSE-organised monthly / quarterly "lesson learning" session (requires participants)
- ➔ Individual self-review / learning for core personnel

The Safety Case Symposium was successful and achieved the objectives as a dedicated platform where global stakeholders of safety cases convened to engage in sharing, learning and discussion on Safety Case related topics.

Sharing of Good Laboratory Safety Practices

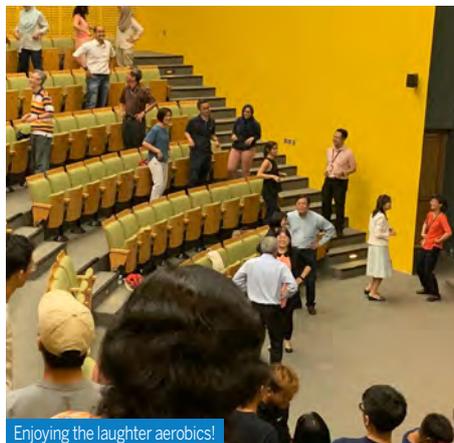
with Temasek Polytechnic



Tok Ai Tee
Quality Control



Every year, Temasek Polytechnic School of Applied Science (ASC) will dedicate a day for safety, known as the "ASC Safety Awareness Day" to highlight the importance of Safety and Health to staff and students. This year's Safety Awareness Day took place on 9 April and I was honoured to be invited as a key speaker to share on the given topic "Good Safety Practices in a Chemical Laboratory". GM (Plant) and Mr Foo Sin Charm also attended this safety day event.



Enjoying the laughter aerobics!



Group Photo with Dr Goh Lay Beng.



ASC TWSH working group meeting.



Receiving token of appreciation from Dr Goh.

Close to 200 staff and students gathered at Temasek Polytechnic Auditorium for this half day event. The programme kicked start with the welcome speech by Dr Goh Lay Beng (Director of ASC) and followed by my presentation topic.

To emphasise that laboratories are hazardous places and laboratory safety is not to be taken lightly, I picked a few prominent laboratory incidents that occurred in local or international academic

institutions to illustrate how things could go wrong in a laboratory setting with severe consequences. From what I observed, several student leaders appeared to be stunned by the incidents shared.

As laboratory safety is a broad topic and I was given a 50 minutes time slot, I restricted my sharing to 13 good laboratory safety practices, covering common mistakes made by many laboratory users. My focus was on chemical storage compatibility, waste segregation, fume hood usage, deviation from test procedures, chemical inventory control issues and even glassware handling procedure et cetera. I was glad that many found my presentation material useful in strengthening the safety culture in their laboratories.

We stayed on to take part in the safety day activities after my presentation. Two spirited young ladies from Ang Mo Kio Family Service Centre shared on the different categories of mental health issues, covering the signs and symptoms for Obsessive Compulsive Disorder (OCD), Schizophrenia, Anxiety disorders, Dementia and Depression. They also clarified the public misconceptions on

these mental health issues. The video on the "social experiment on mental health stigma" produced by National Council of Social Services is a sad truth that our society is still far from accepting people with mental health illness and more work needs to be done in this area.

After the serious topics, we were guided into a session of laughter aerobics by Mr Peter J. Tan. We were taught to balance our 'Qi' by swaying our bodies in the shape of figure "8" and relaxing our minds with laughter. We ended the day with a hilarious chicken dance that was clearly enjoyed by everyone in the auditorium.

A couple of days after the safety day, Temasek Polytechnic contacted us and informed that they are keen on the implementation of Behaviour Based Safety (BBS). Another invitation was extended, and Bernard and I attended their ASC TWSH working group meeting on 10 May to share on our BBS program and benefits we have reaped so far. With their top management commitment in driving the programme, we are sure that Temasek Polytechnic will gain as much from BBS as PCS has.

Sumitomo Chemical Group's 13th Annual Responsible Care Global Meeting



Tok Ai Tee
Quality Control



The Sumitomo Chemical Group's Responsible Care (RC) global meeting is an annual event organised and chaired by the Sumitomo Chemical RC global management team for reaching out to its group companies for communication and promotion of RC activities as a unified group.

This year, the 13th Sumitomo Chemical Group's Annual RC Global meeting is themed as "Penetrating Safety Culture, the Role of Managers". The event took place on 29th and 30th May 2019 at the Sumitomo Chemical (SC) Tokyo head office. A total of 44 representatives from 33 SC subsidiaries and affiliated companies participated in the meeting. Mr Foo Suan Kim (T&O) and I represented PCS for this meeting.

As the meeting was conducted in three languages (70% in Japanese and 30% in English and Chinese), all participants were provided with translation receivers for simultaneous interpretation of the presentations.

The 2-day event started with the opening speech by the Executive Vice President, Mr Hiroshi Ueda, followed by the introduction of General RC activity by General Manager Mr Takanori Ito. The RC vision, mission and values were then presented in six languages to ensure everyone is aligned with Sumitomo Chemical RC strategy.

The 1st day was lined up with RC awards project presentations by award winners (8 oral presentations and 7 poster presentations). It was interesting learning the challenges faced by different industries and their approach in resolving work process issues. The scope of topics presented can be broadly classified into three categories –



Discussion groups focused on case study analysis.

i) Reducing environmental impact through efficient use of material and energy, ii) Improvement to Quality management system, iii) Work automation for improved work safety and efficiency.

One of my favourite presentations is the "Sustainable Use of Recyclable Agrochemical Packaging" presented by the Sumitomo Chemical Latin America (SCLA). It was shared that Brazil enacted a law in year 2000 to ensure every member in the agricultural chain has the responsibility of collecting all empty agrochemical

packaging (Reverse logistic by Law). Farmers wash the empty packaging and return them to distributors who would then keep traceability of the returned packaging for inspection by authorities. With this law, over 94% of packaging are collected and out of which 91% are recycled by recycling companies. For full closure of the life cycle of the packaging, SCLA worked with a recycling company to ensure the packaging materials are sorted, pelletized and extruded to make into new packaging materials that conform to their stringent quality requirements. SCLA's full commitment in driving towards circular economy for their business is truly commendable.

A welcome cum networking buffet dinner was held at the staff canteen on Day 1 evening and we got to enjoy a good spread of Japanese delicacies while mingling with representatives from other countries. We also had a fun game of 'Janken', which is the Japanese equivalent for 'scissor, paper, stone'. The welcome gift, a Japanese folding fan (safety 'sensu') beautifully printed with the SC group RC vision and ground rules, was also a thoughtful gesture by our host to remind us of reducing our carbon footprint with the traditional cooling method.

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Poster presentations by respective award winners.



Photo with the meeting facilitator, Miyata-san.

The 2nd day kicked off with the revelation of the medium term plan and the 2019 RC activity plan. As part of the corporate climate action plan, SC has set a target to reduce greenhouse gases (GHGs) emissions by 30% by year 2030 (base year 2013), and group companies with more than 3000 tons of GHG emissions have to submit the GHG reduction plan by year 2020. To respond to the global plastic waste problems, SC will also establish project team to promote active involvement and contribution to the plastic industry association's efforts to tackle the microplastic issues.

This year's programme differed from the past as there was no plant or lab tour. In replacement, there were three separate group discussions on Safety, Quality Assurance and Chemical Management. I joined the Chemical Management discussion group whereas Suan Kim attended the Safety discussion group. Each group was provided with a case study based on actual SC group companies' incidents and also a table listing the factors of safety infrastructure and safety culture (developed by Japan Safety Competency Center) for discussion. The discussion results were then summarised and compiled for the RC team to further study on possible implementations.

In all, this event is really an experience for me. Apart from learning SC corporate commitment in promoting extensive RC activities throughout the Group, I was also left largely impressed with how meticulously the meeting was planned. Each activity started and ended exactly as planned and efforts were made to rotate the participants to different groups for different day activities, bearing in mind language differences and yet maximizing networking opportunities for everyone. With such excellent RC global management team, we have no doubt that the 2019 RC results will continue to be outstanding for SC group.

Recognition of Mitsubishi Heavy Industries Compressor Corporation



Guo Kang Hui
TNO



Overseer of PCS Projects, Mr. Eu Chee Kong (on the right) presenting a commemorative plaque and performance incentive to MCO Project Manager, Mr. Shinji Matsumoto (on the left).

presented by PCS Engineering Manager Mr Eu Chee Kong to MCO's Project Manager Mr Shinji Matsumoto in the meeting. PCS continues partnership with MCO and seeks for further cooperation and opportunity particularly in PCS-II 2SE.

The journey held with MCO for the SE Plant Main Compressors Revamp (Energy Efficiency) Project took several years for realisation with the initial study commencing back in 2010. The construction itself was carried out in a very tight schedule and congested area where it had to be completed within 27 days in two 12-hour shifts per day for 7 days per week continuously in tandem with Shutdown Maintenance activities. Basing on the available industry guides, a similar replacement of compressors would have taken up to 40 days. It is truly a best efforts with very detailed planning for safe execution and full cooperation of various stakeholders that the compressors installation was carried out ahead of schedule, hence enabling on schedule oil-in and start-up of SE Plant.

SE main compressors were replaced safely and successfully in SDM 2018. This replacement project is to improve energy efficiency through the advancement of high efficiency rotor. A post-project review meeting with Mitsubishi Heavy Industries Compressor Corporation (MCO) was held in Hiroshima on 5th - 6th March 2019. With the good achievement, a commemorative plaque and performance incentive for recognition of MCO's outstanding performance were



PCS appreciative speech by Mr. Eu Chee Kong to MCO Team.



Group Photo of the Dedicated Team.

Functional Safety Awareness Training for Plant Operators



Dominic Chee
T&O



Subject Matter Expert, Er. Thia Cheong Meng of TUV Rheinland Singapore.

In the months of April and May 2019, eight ½ day training sessions on Functional Safety awareness were conducted, one for each shift team from Olefin-I and Olefin-II. These sessions were conducted by subject matter expert, Er. Thia Cheong Meng of TUV Rheinland Singapore, Principal Risk Consultant working for Yokogawa Engineering Asia Pte. Ltd. The training sessions were held at T12 training room in PCS Admin Building with a total of 157 PCS staff who attended.

The awareness trainings were targeted at the frontline plant technicians and introduced the basic knowledge of Functional Safety based on international standards IEC 61508 and IEC 61511.

What is Functional Safety in the Oil, Gas and Petrochemical industry?

As the safety of process plants in the major hazards industry is becoming increasingly important, complex safety systems are employed to attain the safety requirement

by reducing the risks. Functional safety describes the application, implementation and validation of these safety-related systems. The requirements of the electrical, electronic and programmable electronic safety-related systems are described in the internationally acknowledged standard IEC 61508. As for IEC 61511 (derived from IEC 61508), it focuses on one type of instrumented safety system used within the process sector, the Safety Instrumented System (SIS).



16 May Course Participants.



Hazardous Area Awareness Training

Two 1-day training sessions on Hazardous Area Awareness were conducted on 28 March 2019 and 18 April 2019. These sessions were conducted by subject matter expert, Mr Jumpol Thojun from TUV Rheinland Thailand. A total of 40 PCS plant executives attended the training sessions.

In each session, Mr Jumpol introduced the basic principles of explosion protection in hazardous and explosive environments to the participants. He expertly introduced the concept of hazardous areas, its definition and classification, the types of explosion protection for equipment and the requirement for the installation, inspection, maintenance and repair of equipment in the hazardous areas.

He gave an overview of the codes and regulations, such as EU Directives ATEX

Subject Matter Expert, Mr. Jumpol Thojun of TUV Rheinland Thailand.



Dominic Chee
T&O

114 and 137, and the IECEx scheme that equipment manufacturers need to conform to and indicate in their equipment specifications. Users would then have to ensure that these equipment are used in hazardous and explosives environments conforming to the codes and regulations including knowledge for subsequent inspection and maintenance or repair.



28 March Course Participants.



18 April Course Participants.

Singapore International Water Week Spotlight 2019 delegates site visit to PCS



Calvin Neo
T&O



Welcome group Photo at the Visitors' Ethylene Molecule Sculpture.



Specially prepared commemorative brochure for delegates.



Welcome address by PCS GM (Plant), Er. Lucas Ng.

As part of PCS's ongoing proactive efforts to further promote Industrial Water Solutions, PCS was pleased to accept PUB's invitation to welcome delegates of The Singapore International Water Week (SIWW) Spotlight 2019 to visit PCS, including the newly commissioned Treated Wastewater Recovery Plant (TWRP) on 7 June 2019.

As part of the event programme and to enrich delegates' experience of SIWW Spotlight 2019, specially curated technical site visits were arranged. This year, delegates get to witness how companies from diverse industries – petrochemicals, nutraceuticals and wafer fabrication – have set exemplary records in enhancing water efficiency. The three selected site visits were Petrochemical Corporation of Singapore (Private) Limited, Wyeth's Wastewater Treatment and Reclaim Plant, or Systems on Silicon Manufacturing Company.

There were a total of ten delegates from industries and embassies, three (3) officials from Public Utilities Board (PUB) and one organising executive visited PCS. The visitors were warmly welcomed by a team of PCS staff, which includes PCS General Manager (Plant), Er. Lucas Ng, various PCS's Functional Representatives and project members of the (TWRP).

The site visit started off with a group photo taking session at the Visitors'

The visitors were then invited to watch PCS corporate video, which showcased PCS key roles as an upstream petrochemical company, and a presentation of TWRP demonstration plant by Project Team Member, Mr Sim Kai Sheng. Mr Sim shared the phased approach of doing an in-house Phase 1 Pilot Study to identify any possible technical issues followed by actual design, construction and commissioning of Phase 2 demonstration plant, to recover treated industrial wastewater for process use.

After the presentation, the visitors were taken to the site of the TWRP demonstration plant, accompanied by Er. Francis Tan, Mr Sim Kai Sheng and Er. Ee Boon Siong. The delegates were given an on-site visual experience of its actual operation. The site visit continued with a familiarisation bus tour around the Singapore Petrochemical Complex to introduce the various manufacturing plants in the Complex.

Each delegate was also given a specially prepared commemorative brochure as a keep sake for this special occasion and certainly walked away enriched with PCS's efforts to promote industrial water recycling. There were very positive comments received at the end of visit, including the well-established HSE Management System that delegates had experienced in PCS.



Delegates at Treated Wastewater Recovery Plant (pre-treatment MF) and Top (Left: RO modules, Right: Activated Carbon Filters).

National Workplace Safety and Health Campaign 2019



Francis Tan
T&O

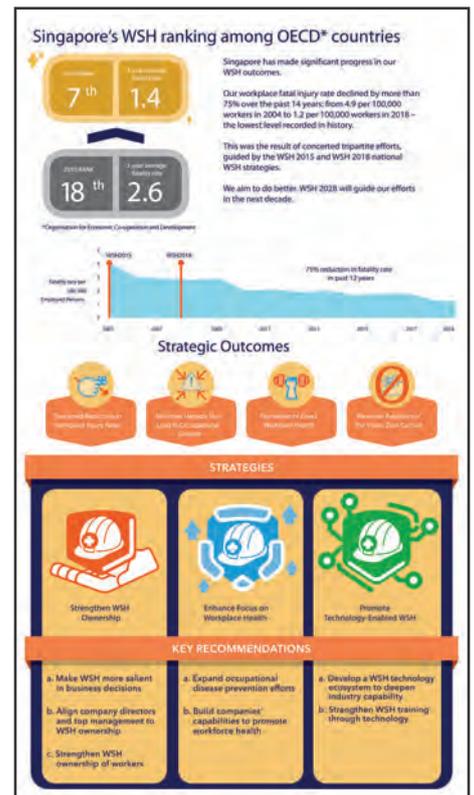
As part of Workplace Safety and Health (WSH) Council continual drive to promote a healthy lifestyle, 14 PCS Employees and Contractors joined with some 700 participants, for a 3.5 km Fun Walk at Gardens by the Bay East on Saturday, 20 April 2019. The morning walk helped to reinforce the message for everyone to take time to take care of our safety and health.



Tripartite Representatives – Take Time to Care of our Safety and Health.

The National Workplace Safety and Health (NWSH) Campaign was launched by Guest of Honour Mr Zaqy Mohamad, Minister of State (MOS) for Manpower and National Development, together with WSH Council Chairman, Tripartite Representatives from NTUC, and Singapore National Employers Federation. In his opening remarks, MOS Mr Zaqy briefly touched on two of the WSH 2028 Tripartite strategies namely on strengthening WSH ownership and enhancing focus on Workplace Health.

The first strategy involved using this year WSH Campaign on “A Word of Care” to foster a culture of care for one another for prevention of unsafe acts. This was reflected in multiple safety messages during the Walk using cut-out life size poster with the use of some colloquial words such as “Eh”, “Bro”, “Oi” and “Hey” to catch fellow worker’s attention to care for one another when workers see a co-worker about to carry out an unsafe act.



It is similar to our WSH initiative of speak out for safety. This message was facilitated via a new Campaign video produced by WSH Council.

The second strategy is consistent with Total Workplace Safety and Health (**Total WSH**). It was very apt that free basic eye screening was provided by Community Partner to drive home the point not to take our personal health for granted but to continue to stay fit and healthy through regular exercise and eating healthily. Workers with certain health risks such as diabetes and hypertension need to continue to monitor their health closely. Experienced workers are going to work longer thus Total WSH brings mutual benefits to workers (employability) and employers (productivity).

Hence, companies need to adopt an integrated approach to managing occupational safety and health. With the



2.8KM Fun Walk



Official Launch with Colloquial Words – Some Words of Care.

Continued on page 15

Continued from page 14



PCS and PCCA Walkers at the Finishing Line.



VISION ZERO and Take Time to Take Care of our Safety and Health Banners at PCS.

adoption of Total WSH together with **Vision Zero Movement**, to developing a mindset that all injuries and ill-health arising from work are preventable and ultimately zero

harm is possible, it will certainly help to accelerate the achievement of WSH 2028 Tripartite Strategies to reduce workplace fatality to less than 1.0 per 100,000

workers from 1.2 in 2017 and 2018, the lowest recorded for Singapore, through a healthy workforce in safe workplaces.

Employee News

LONG SERVICE

Presentations on 25 & 30 April 2019



25 Years

Rosmadi b Mohd Taib

Quality Control

30 Years

Sim Beng Hiang
Chan Chee Wing
Lee Shaw Yong
Yew Kam Chiew
Ng Chee Wai

Feedstock Procurement
Maintenance
Olefin I
Olefin II
Technology & Optimization

35 Years

Lim Siew Hong
Chee Tse Koon
Kirk Kian Chuan

Account & Finance
Olefin II
Technology & Optimization

NEW EMPLOYEES



Mr Goh Yong Sin
Technician, Olefin I
Joined 2 May 2019
Hobbies: Badminton



Mr Aashiq Muhammad b Haja Maidin
Technician, Olefin I
Joined 2 May 2019
Hobbies: Soccer



Mr Muhammad Faris b Aziz
Technician, Olefin I
Joined 3 June 2019
Hobbies: Bowling, Soccer



Mr Muhammad Khairul b Sari
Technician, Olefin I
Joined 3 June 2019
Hobbies: Jogging, Swimming



Mr Sim Khong Yee
Leading Fireman,
Fire & Security
Joined 3 June 2019
Hobbies: Fishing, Cycling



Ms Soh Hui Ting Rina
Senior Engineer,
Engineering
Joined 3 June 2019
Hobbies: Swimming, Baking



From left : Lilian Lee (GMC) & Lim Siew Hong.



From left : Chan Chee Wing, Yew Kam Chiew, Ng Chee Wai, Lucas Ng (GMP), Rosmadi b Mohd Taib, Chee Tse Koon & Kirk Kian Chuan.

HEARTIEST CONGRATULATIONS

marriage



NAME	FUNCTION	SPOUSE
Yew Kam Chiew	Olefin II	Ng Bee Ting

births



NAME	FUNCTION	NEW BORN
Muhd Rafneezan b Noordin	Olefin I	Girl
Ngai Jia Ming	T&O	Girl
Ho Yeow Hsing	T&O	Girl

London

and beyond



Joyce Lee
Mktg & Sales

There is so much to see, eat and do in London (shopping and musicals included!) that it was difficult to decide which other cities to visit during our 12-day spring vacation in England. Here are some highlights of London and our self-drive trip out of London.



Borough Market is one of the largest and oldest food markets in London, with an incredible variety of food, people and culture. The food stands boast various fruits/vegetables, spices, pastry, freshly cooked mushroom risotto, seafood paella and not forgetting their amazing cheeses and soups.

The Tower of London on the banks of River Thames is an infamous castle, the backdrop for interesting stories of kings, queens, criminal plots and treason. We learnt that the 1,000-year-old castle protects the Crown Jewels and also listened to an animated and eloquent Beefeater (a ceremonial guardian at the Tower of London) tell stories of its violent past. We also toured the Crown Jewels exhibition, where we were dazzled by the sheer size and number of diamonds on show.



Bath, as its name suggests, is renowned for the well-preserved baths that were built by the Romans. The hot water springs, once regarded as sacred, and the fascinating history and striking architecture ensure that the Roman Baths are still a popular tourist destination. I felt that the £16 entry ticket was worth every penny as the attraction was very well-done with wonderful visual displays and auditory guide; one can really imagine yourself as a Roman visitor at the Baths. Besides the Roman Bath, the city itself is beautiful, especially the majestic Bath Abbey and the gorgeous Pulteney Bridge.



Stonehenge, also a UNESCO World Heritage Site like Bath, is a prehistoric monument consisting of a ring of standing stones, with each standing stone around 13 feet high, seven feet wide and weighing around 25 tons. Archaeologists believe it was constructed from 3000 BC to 2000 BC and it remains shrouded in mystery till today, with theories of it being anything from an ancient healing center to an alien landing site.

Stratford-upon-Avon is most famous for being the birthplace of William Shakespeare. Now a bustling market town with its own (smaller) version of the London Eye, it is steeped in charm and history with a vibrant mix of high street stores, tea rooms, restaurants and bars. Sitting back and relaxing on the banks of the River Avon with a drink and watching the elegant swans come and go, I learnt from a local that swans in England are all owned by the Queen!



The Cotswolds is a rural area in south central England, with rolling hills and medieval villages, churches and characterised by attractive small towns built of honey-coloured stone. We googled for "most beautiful village in Cotswold" and found Bourton-on-the-Water, fondly known as 'the Venice of the Cotswolds'. The clear waters of the river trickle through this pretty village under many small bridges. Lined on both sides are golden stone cottages built many centuries ago, some converted into tea rooms, museums, cosy pubs and picture-book houses.

National Gallery – If you love art and history, this is one of the places to be. The museum is free (as are most of the amazing museums in London). There are really good art collections and I was so thrilled to be able to view the Impressionists (Monet, Van Gogh) paintings in real life. Outside the museum, it was equally vibrant with many talented street artists and performers busking amidst the crowd of onlookers.