



Shanghai, China, 19-20<sup>th</sup> September 2017

**THE CHEMSS EDU R&D NETWORK –  
MEETING THE GROWING NEEDS IN CHEMICAL AND ENVIRONMENTAL SAFETY AND  
SECURITY EDUCATION, TRAINING AND RESEARCH**

**INTRODUCTION - meeting the growing needs in chemical, environmental and food safety and security education, training and research.**

1. Due to worldwide expansion of chemical activities and toxic chemicals the potential of a misuse of chemicals intentionally or non-intentionally is a growing worldwide threat. Most countries expand and/or introduce chemical industries because of development requirements. As a result, the need for experts in the areas of chemical safety and security, as well as its influence on environmental protection and food safety, has become of great importance, and industries, research centers, universities and students have shown an increasing interest in chemical safety and security specialties.
2. Chemical Safety and Security global process - CHEMSS process - addresses chemical and environmental safety and security solutions in the whole supply chain. CHEMSS process promotes global culture in chemical safety and security and develops global market for chemical, environmental and food safety and security. CHEMSS global process was defined, developed and led by **the International Centre for Chemical Safety and Security (ICCSS) in Warsaw, Poland ([www.iccss.eu](http://www.iccss.eu))**.
3. CHEMSS global process brings together chemical and environmental safety and security leaders and practitioners from government, international organizations, industry, academia and civil society in an industry-oriented, science-based, and non-political forum. CHEMSS global process was formally initiated at the first global summit CHEMSS2016 [www.chemss2016.org](http://www.chemss2016.org), organized by the ICCSS in Kielce, Poland, on 18-20 April 2016. Chemss2016 gathered over 400 participants from 47 (mainly developing) countries, with major delegations from China and US. CHEMSS2016 adopted, inter alia, the CHEMSS2016 Summit Declaration on the development of international cooperation to enhance chemical safety and security and the promotion of a global chemical security culture and education, which is a policy basis for the development of CHEMSS process.
4. CHEMSS global process is being developed by the ICCSS in partnership with **China Petroleum and Chemical Industry Federation - CPCIF**- [www.cpcia.org.cn](http://www.cpcia.org.cn), a non-government, not-for-profit organization consisting of companies, institutes, sectoral organizations and local associations in the petroleum and chemical industry on the voluntary basis and as the umbrella organization that provides service and implements certain administrative functions within this industry on the national level.
5. ICCSS and CPCIF will organize CHEMSS2017 in Shanghai, China on 19-20 September, 2017 ([www.chemss2017.org](http://www.chemss2017.org)), followed by 2017 China Petroleum & Chemical International Conference (CPCIC), a yearly gathering of Chinese petroleum and chemical industries and their international partners.
6. CHEMSS2017 will confirm that sustainable chemical safety and security measures have to be established and introduced to support the development needs, to prevent misuse of toxic chemicals and to protect society and industries. The development of the implementation of training and education in chemical safety and security at all levels of society, and especially



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in all the educational organizations and within industries, will play a major role in this process. It will be a major factor to seek and ensure that chemicals are only used for peaceful purposes and in a safe manner.

7. CHEMSS2017 will initiate CHEMSS EDU R&D NETWORK, a global gathering of universities, research centers, academic institutions, laboratories, industries and training facilities. The partners of the CHEMSS EDU R&D NETWORK will develop guidance to advise and assist governments, industries, universities, research centers, and academic institutions, in the development of a series of research, educational and training programs, including graduate (Master of Science), post-graduate, training courses, and certificate programs in the areas of chemical and environmental safety and security, tailored to the needs of industries and countries, especially developing countries.

8. The CHEMSS EDU R&D NETWORK will develop **Education and Training Chemical Safety and Security Plan** which will envisage the development of guidance for educational and training programs in chemical, environmental and food safety and security that could be used by all interested governments, industries and academia.

#### **EDUCATION AND TRAINING AS CORE REQUIREMENTS TO DEVELOP GLOBAL CHEMICAL, ENVIRONMENTAL AND FOOD SAFETY AND SECURITY**

9. An increase in demand for chemicals and the interest in expanding or developing chemical development, production and use, significantly raises possible malicious acts involving chemical materials, what is becoming an issue of growing concern for national authorities, industries, academia and the international community. Moreover, the quick expansion of chemical industries and use of chemicals in the developing countries has not corresponded with the relevant increase of expertise and practices in chemical safety and security. While the chemical production is moving rapidly to the developing countries, the extensive experience in chemical, environmental and food safety and security has remained in the developed countries. It is becoming evident that the global chemical expansion will affect negatively all countries due to the worsening of chemical, environmental and food safety and security in the future. Hence, there is a demonstrated increasing need for well qualified experts and specialists in chemical, environmental and food safety and security.

10. In addition, the continued loss of qualified personnel in the developing countries due to career development and moving to the developed countries, lack of career development in the Western countries due to the ongoing reduction of chemical production, retirement and administrative changes, negatively affect readiness of chemical industries and governments to carry out chemical safety and security tasks effectively. At the same time, technology and procedures are evolving at an increasing pace with the introduction of new chemicals, equipment and techniques. Consequently, there is a rapidly growing need for highly qualified experts in chemical safety and security in the whole chain of chemical activities, at the national level, within the industries and among the users of chemicals.

11. It is therefore essential that sustainable chemical, environmental and food safety and security expertise is achieved and maintained in the whole chain of chemical activities, and developed and maintained among the producers and users of chemicals, at local, national, regional and global levels.

**12.** These goals can be reached through appropriate research, training and education at all levels and in all organizations and facilities involved in chemical activities. A well-educated and trained workforce is needed to lead and contribute to the establishment and maintenance of an chemical safety and security culture.

**13.** The need for human resource development programs in chemical safety and security covering the whole chain of chemical activities was emphasized at the first global summit on chemical safety and security CHEMSS2016 ([www.chemss2016.org](http://www.chemss2016.org)) organized in Poland in April 2016, and in the CHEMSS2016 Declaration.

**14.** In spite of the recognized need for a well-defined human resource development programs to meet growing needs to protect chemical activities, there is a limited number of well-developed, technically oriented and comprehensive educational programs which cover these areas in an integrated way.

**15.** Therefore, the CHEMSS EDU R&D NETWORK will take the lead to develop, together with and experts from chemical industries, academic institutions, research centers and international organizations, an **Education and Training Chemical Safety and Security Plan**. The Plan will make an emphasis on a Master of Science (MSc) programme, post-graduate programs, training courses and a certificate programme, which offers integrated education and training in chemical and environmental safety and security.

## **PARTICIPATION AND OBJECTIVES**

**16.** The CHEMSS EDU R&D NETWORK will bring together industry and scientific researchers, university curriculum developers, chemical safety and security instructors and practitioners, and human resource development managers. They will establish a working network to develop training programs and education in chemical and environmental safety and security. The network is open for government and industry decision makers, operators, managers at regulatory authorities, law enforcement agencies and managers, who are engaged in providing security.

**17.** The participants of the CHEMSS EDU R&D NETWORK will:

- a.** provide a comprehensive and current overview of the recent research, training and educational programs in chemical, environmental and food safety and security;
- b.** provide guidance for an MSc programs, post-graduate studies and a certificate program in chemical safety and security. They will be introduced and implemented by the members of the CHEMSS EDU R&D NETWORK in their research, training, academic and post-graduate programs. They will be offered to universities, research centers, other academic institutions, industries and training facilities in the development of their own curricula in chemical, environmental and food safety and security or in expanding their academic programs related to these issues.

**18.** **The Education and Training Chemical Safety and Security Plan** should be considered as guidelines to facilitate the development of comprehensive chemical safety and security human resource development programs. Its purpose is to build up and maintain relevant knowledge and skills, and sustaining qualified personnel dealing with chemical safety and

security. The program will be intended to provide both the theoretical knowledge and the practical skills necessary to meet the requirements in chemical, environmental and food safety and security outlined in the national, industry and international frameworks.

## **SCOPE of ACTIVITIES**

**19.** The scope of the CHEMSS EDU R&D NETWORK activities is broad and covers education, training and research in all areas of chemical and related environmental and food safety and security. It will range from the development of the MSc program to prepare highly educated staff with in-depth knowledge, post-graduate studies, through specialized courses, to a certificate program for the development of certified chemical safety and security specialists.

**20.** It is also the intention of the CHEMSS EDU R&D NETWORK to develop curriculum for short courses suitable for continuing education or possible on the job training programs or fellowship programs.

**21.** The relevant emphasis will be put on the recent and incoming safety and security challenges, including cyber safety and security.

**22.** The activities and the work of the CHEMSS EDU R&D NETWORK will be based on publically available documents and materials.

## **AREAS OF ACTIVITIES**

**23.** The work of the CHEMSS EDU R&D NETWORK will be divided into four major areas.

**24.** Area 1 will cover the overview of the background, objectives, scope and structure of the Education and Training Chemical Safety and Security Plan, analyze its relationship to existing educational and training programs which contain chemical and related environmental and food safety and security components.

**25.** Area 2 will focus on the human resource development aspect of capacity building in chemical, environmental and food safety and security in general.

**26.** Area 3 will provide an overview of the recommended MSc program, post-graduate program, set of specialized courses, and a certificate program for the development of certified chemical and environmental safety and security specialists.

**27.** Area 4 will give an introduction to the modern technologies and techniques, to be introduced and implemented to meet the growing pace of science and industry developments in chemical and related environmental and food sectors. It will also respond to growing threats in chemical areas, including need to increase protection of chemical activities from cyber threats.

**28.** Area 5 will provide a platform for exchange of information, establishing contacts and searching cooperation opportunities in research and development projects devoted to chemical and related environmental and food safety and security.

## **RELATIONSHIP TO EDUCATIONAL AND TRAINING PROGRAMS IN THE AREAS OF CHEMICAL SAFETY AND SECURITY AND ENVIRONMENT**

**29.** There are numerous educational and training programs around the world which deal **separately** with chemical safety, chemical security, or environmental and food safety issues. The issues of environmental security or food safety are still very rear in the education or training.

**30.** There is a major need to provide programs with a focus on integrated chemical and related environmental and food safety and security. They should cover elements of chemical security, such as protection of chemical material or the physical protection of chemical facilities, transportation and storage, basic rules and also programs for chemical safety, legal and managerial aspects of environmental protection or food safety, and social, legal and political aspects of misuse of chemicals.

**31.** Therefore, the CHEMSS EDU R&D NETWORK will undertake efforts to fill this gap and provide the governments, industry, research and academic communities with a modern and comprehensive overview of chemical safety and security by developing the Education and Training Chemical Safety and Security Plan to be available at national and international levels.

#### **CAPACITY BUILDING IN CHEMICAL SAFETY AND SECURITY: HUMAN RESOURCE DEVELOPMENT**

**32.** People are the “most valuable and prized asset” in any enterprise or industry. Human resource development, including education and training, plays a central role in the development of both individuals and societies since it reinforces sustainable social, economic, technical and cultural growth. The importance of competent and talented staff is especially valid in global chemical and petrochemical industries. Since chemical and petrochemical industries are undergoing deep changes and transformation, availability of people, especially those who could adapt to changing environment and introduce innovative, environmentally and economically sound solutions, is a condition sine qua non of effective business functioning. Global chemical and petrochemical companies will need to manage the changes in a difficult talent environment marked by a growing lack of experts and competent staff especially in the developing countries. Global chemical companies and small and medium size companies will need to implement an active human resources and executive search in new and innovative ways.

**33.** Chemical training and education are subjects to industry or national policies, despite the existence of global chemical industry. The competence for the contents and the organization of chemical training and studies remains at the national level.

**34.** The provision of an appropriate national and industry chemical safety and security human resource development programs becomes an essential instrument to guarantee the safe and secure development of chemistry worldwide and its peaceful uses. It will also support the development of sustainable chemistry.

**35.** Human resource development in chemical safety and security should aim at building, upgrading and strengthening the knowledge and skills of personnel, authorities, decision-makers in the areas of chemistry as well as related environmental protection and food safety. It should focus on building chemical safety and security culture.

**36.** Countries and industries can benefit greatly from the services of graduates of chemical safety and security educational and training programs. They can be better protected against misuse of chemicals. The graduates of chemical safety and security educational and training programs can provide expertise to design, establish, and maintain the highest levels and new techniques to improve chemical safety and security.