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## EHS Challenges Facing Universities with International Collaborations and Agreements

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In the past decade, there has been an increase in the collaboration between Institutions of Higher Learning from one country to another. The scope of these collaborations and agreements can vary widely. However, one issue that needs to be addressed in all cases is the need to provide services related to health and safety of all personnel and assure protection of the local environment. This paper attempts to start a dialogue about these issues between environmental, health, and safety (EHS) professionals and faculty and administration of the entities involved. It presents a series of questions that must be asked whose answers will lead to the identification of the potential EHS issues that could arise. These will provide the opportunity to identify the actions that must be taken to eliminate or mitigate the potential issues. It is critical that these issues be identified and addressed during the development stage and not after agreements have been reached and collaborations started.

**Keywords:** International collaborations, Institutes of higher learning, EHS risks

### 1. Introduction

In the past decade, there has been an increase in the collaboration between Institutions of Higher Learning (IHL) from one country to another. Many universities in the U.S. have established relationships of various degrees with institutions or governments around the world including Abu Dhabi, China, India, Japan, Qatar, Russia, Singapore, South America and many more. The scope of these collaborations and agreements can vary widely as described below. However, one issue that needs to be addressed in all cases is the need to provide services related to health and safety of all personnel and protection of the local environment. This paper attempts to start a dialogue about these issues between environmental, health, and safety (EHS) professionals and faculty and administration of the entities involved. It is critical that these issues be identified and addressed during the development stage and not after agreements have been reached and collaborations started. On-going assessments and adjustments in agreements should be made as conditions change and lessons are learned.

### 2. Scope is Complex

The scope of agreements or collaborations can vary from a very simple exchange of ideas between two individual collaborators and a full fledged collaboration involving many faculty and students from two universities in different countries working and/or studying in each others' institutions. The number of people involved, the location of work, the type of activities, and the length of time spent in an out of

country location will all determine the extent of EHS issues that may be encountered and lead to appropriate solutions.

The following are some examples with a simple ranking of potential EHS risks from low to medium to high:

- a) People visiting other institutions for short periods of time to exchange ideas and/or learn something new. This is very common and universal and has occurred for centuries. This has low EHS risks.
- b) People studying or teaching at other institutions for moderate periods of time. This is also common and universal and has occurred for centuries and presents a low EHS risk.
- c) People conducting research at the other institution's facility. This has been increasing in the last few decades and depending on the type of research and the facility, could present a moderate to high EHS risk.
- d) People living on the campus of other institutions while collaborating. The level of EHS risk depends on the location, political climate and type of facility and can be from low to high risk.
- e) One institution providing assistance to an institution or government in another country that could range from curriculum development to facility design. This can present anywhere from a low to high risk depending on the extent of the assistance.

The potential list of stakeholders that could be involved in addressing the EHS issues during the development stage will depend on the particular collaboration or agreement and may include some or all of the following.

- Faculty/Principle Investigators;
- Administrators;
- Financial Officers;
- Medical Service Providers;
- EHS Professionals;
- Facility Managers;

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- Local Regulatory Agencies;
- Government Officials;
- Legal Counsel; and
- Human Resources.

### 3. What are EHS Concerns?

The EHS professionals of all the Institutions involved will primarily be concerned for the health and safety of all personnel as well as protection of the local environment. The former will address the prevention of injury or illnesses to personnel or local community. The latter addresses prevention of property damage due to fire, explosions, or floods and adverse effects on the environment due to improper handling, storage, and disposal or accidental release of hazardous materials to the air or water.

These agreements can present some significant challenges to each institution's EHS professionals. The major challenge is to identify their role. Possible roles include fulfilling regulatory requirements; providing advice on facility design; providing advice on building and implementing an Environmental, Health, and Safety Management System (EHS-MS); providing EHS services ( e.g. training, waste management, emergency planning and response, inspections, etc. ) directly to the location in another country or performing EHS audits or peer reviews.

The challenges include the following:

- Identifying who is doing what activities and where off campus are they conducted; For example, students are less experienced than faculty and staff and therefore present a greater risk. The level of supervision provided will also help determine potential risks. Similarly, activities involving toxic chemicals, radiation, microbiological agents and sophisticated equipment present a greater risk than activities that use small quantities of relatively non-hazardous materials.
- Differences in regulations applying to IHLs; There are different requirements for obtaining licenses and/or permits to use hazardous materials or equipment. In some countries these are required at the Institution level while in other countries these are required at the department level or even at the faculty or principle investigator level. They can require different levels of detail and qualifications for obtaining the licenses and/or permits as well as having different renewal time periods. In the U.S. the license to use radioactive materials is frequently granted to the Institution while in Singapore and the UK among other countries it is the individual user of radiation who obtains the license. Is it possible that one country's regulations may be in conflict with another countries'. In this case, a decision must be made as to which regulations apply. For example, Singapore regulations require very specific and formal risk assessments for use of hazardous materials that are not a requirement in the U.S. Although both require the same controls conceptually, the formality of requiring written

documents is different.

- Differences in culture; In some cultures the manner in which constructive criticism is provided is very specific. Who delivers the criticism and when and how it is delivered can be very critical. In some cases it can be quite hierarchal. Relationships with regulating agencies must be handled with sensitivity. In some countries there may be a very open environment that allows for a free exchange of ideas and questioning of the applicability of regulations. In others even the perception of a friendly relationship may evoke criticism from the general population.

In some cultures internal EHS professionals are viewed as partners and collaborators while in others they are viewed as regulators. The approach to delivering EHS services will be different for each culture.

- Differences in institutional policies or governance practice; even within countries IHL's may have different requirements of oversight and approval of work with hazardous materials or performing certain activities. In the U.S. most IHL's have faculty committees that approve or authorize use of biological and radioactive materials. However, for chemical use this process is not typically conducted.

- Differences in legal system; and as noted above EHS regulations may be different from one country to another. The legal liabilities of violating these regulations may also be different. Financial penalties as well as criminal penalties may range from minor to significant.

- Differences in available resources; even within countries EHS services can be provided internally or externally by hiring contractors or consultants to perform some activities. The availability of qualified people may be limited or quite expensive in some countries.

- Quality of facilities; Laboratory facilities need specialized safety equipment such as fume hoods, biological safety cabinets, emergency showers, eye washes and fire detection and suppression systems. The performance of these systems can vary greatly from one manufacturer or installer to another even within countries. These differences can be greater from country to country.

There is need for a standard mechanism or process to identify and address the potential EHS issues at the Design Stage of any agreement or collaboration. Simply stated, "*EHS needs to be fully engaged early.*"

There are several related issues while not directly an EHS issue that can affect the EHS role. One is the perception in each institution and community. There should not be any perception that the "foreign personnel" are not following local regulations and customs nor that they are performing research in one country that would not be allowed in their country because it is too dangerous or too controversial. There may be Human Resource issues related to the local cultures that can affect the "foreign personnel." Financial procedures followed may be different and result in poor use of resources or perceptions of impropriety. Ultimately, the EHS personnel wants to assure that the research and

education is being conducted with the least burden to faculty, staff, and students. Collaboration between EHS staff of all institutions involved becomes paramount<sup>1)</sup>.

#### 4. Process to Determine EHS Issues and EHS Role

The EHS professionals need detailed information early on to determine the extent of the EHS risks and develop a mitigation plan to eliminate or reduce those risks. This starts with a series of questions as indicated in Table 1. The answers to these questions will most likely lead to more questions. Once all the relevant information is obtained, all those involved can more accurately assess the risks and develop a plan to mitigate the potential hazards.

**Table 1** Information Necessary to Determine Potential EHS Risks for Collaborations between Institutions in Different Countries

Who is collaborating (faculty, staff, students)?
What are they doing (studying, teaching, advising, research)?
How long will they be there?
Does the activity involve work with any hazardous material, equipment or processes?
Who "owns" the materials, equipment, and space?
Who will supervise students and staff?
What licenses or permits are needed?
Whose rules will be followed? The more strict ones?
Who will monitor compliance with the rules?
Who approves research with biological, radioactive or chemical agents?
Who approves research with animals?
Who approves research with human subjects?
Who provides oversight?
Who approves the facility design?
Who approves safety equipment (hoods, eye wash, showers, etc.)?
Who will be responsible for decontaminating and decommissioning the facility at the end of the agreement?
Who approves personal protective equipment (eye protection, gloves, and respirators)?
Who provides emergency response?
Where are accident and injury reports kept?
Who investigates accidents?
Who will provide medical treatment and occupational health services?

The most common default position now held by EHS professionals is for the visiting institution to assume the host institution accepts full responsibility for the health and safety of all personnel who work in or visit their facilities. This goes beyond the concern they would normally have for all visitors to their institution. This means assuring that those visitors conducting research in their facilities know and understand the institution's policies and procedures and assure they are being followed. Conversely the EHS professionals for the host institution expect that all visitors will adhere to the

host institutions' policies and procedures. This may require extensive training on local rules and regulations that may be very different than the visitors' have experienced in their culture.

The host institutions may assume that these "visitors" have been adequately trained prior to their arrival but the visitors still need to know and understand any local risks and requirements.

In the ideal situation, there would be some form of "certification" or "accreditation" of each institution's EHS program that would include the process for handling visiting researchers. However, since this does not exist, it is necessary for each institution to establish communication with the other's health and safety organization and determine how best to achieve the objective.

One option is for the host institution to treat visitors as new employees and students and provide the EHS support that would be given to their employees or students performing the same activity. Another option is for the visitor's institution to provide some basic level of training with site specific training provided by the host institution. In either event, each institution should be aware of what each requires regarding EHS policies, procedures, and training and that any differences are resolved in advance.

#### 5. Conclusions and Recommendations

The collaborations between Institutions of Higher Learning from one country with another has been and will continue to increase as the world's need for the discovery and sharing of knowledge increases<sup>2)</sup>.

Since there can be significant differences between these institutions' EHS policies, procedures, and facilities it is imperative that the institutions first understand and then harmonize the EHS programs. Several efforts have already been reported<sup>1)</sup>. The International EHS Community must continue this dialogue and explore the most efficient and effective ways to address these issues.

Finally, efforts to mitigate risks must be identified and implemented in each case. These may include: increased training, providing supervisory oversight, establishing standard operating procedures, creating awareness, providing appropriate safety equipment and personal protective clothing similar to that which is used in the visitors institution and harmonizing any differences in expectations or procedures.

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