SAND2013-1718P

Lesson:

Field Biosecurity

Design Document

Sandia National Laboratories
International
BIOLOGICAL THREAT REDUCTION
BEP
CBEP
Cooperative Biological Engagement Program

Part I: Lesson Overview

Lesson Description

Overview

Field Biosecurity is a course designed to familiarize students with the unique challenges of conducting biosecurity in environments outside the life-science facility. It is meant to frame the way students think about biosecurity in the field, and apply general concepts of biosecurity risk assessment, mitigation, and performance to wide, open and often isolated environments.

Scope

This lesson will provide an introduction to the challenges faced by life-science practitioners in securing pathogens while working in the field. It will also provide a framework for thinking about these challenges and their possible solutions, and allow students to explore these challenges and possible solutions through situational activities. It will NOT provide mandatory directions and procedures for securing specific agents during work in the field.

Learning Level
based on Bloom's taxonomy

- ✓ knowledge
- ✓ comprehension
- ✓ application
- synthesis
- evaluation

Length of Course

8 hours

Lesson Objectives

At the end of this lesson, learners will be able to:

Organizational Objectives

- To protect biological agents and toxins facility from loss, theft, or misuse during field work.

Instructional Objectives

- Describe the difference from the laboratory in the ability to secure biological agents and toxins during field collection and transport procedures.
- Demonstrate procedures that are suitable for securing biological agents and toxins outside of the laboratory.

Personal Objectives

Know

- How procedures in the field differ from the laboratory in terms of the ability to secure biological agents and toxins.
- What procedures are suitable for securing biological agents and toxins outside of the laboratory.

Feel

- Confident that appropriate procedures for securing biological agents and toxins during field work and sample transport are chosen and applied.

Do	• Write and demonstrate procedures that are suitable for securing biological agents and toxins outside of the laboratory.
Key Messages	• Field work with pathogens and toxins is very different from laboratory work – security is also different in the field versus the laboratory. • Many laboratory biosecurity measures can be modified and adapted to field work. • The same frameworks for approaching risk management in laboratories can be utilized in the field. • Biosecurity risk mitigation in the field places special emphasis material control and accountability as well as personnel accountability. • Security awareness is crucial in field biosecurity.

Evaluation Strategy

Level 1 (satisfaction):	Students will complete a satisfaction survey about their experience with the lesson
Level 2 (learning):	Students will complete an example SOP for securing samples in the field and also write a "contract" for the next steps needed to begin implementation of better biosecurity policies for their institution's field work.
Level 3 (behavior):	Desired behavior is for students to independently engage in proper analysis and mitigation of biosecurity risks as appropriate in the field – this behavior will be evaluated six to twelve months post-training and may entail further training
Level 4 (organizational change):	A repeat of the training needs assessment will be performed at least annually – this annual assessment can be compared to the baseline assessment to determine improvements to field biosecurity policies and procedures

Learner Description (for lesson design purposes)

Number of learners:

10 to 25; small groups of 5 people each

Biorisk Management Role:

Policy Makers
Top Management
✓ Biorisk Management Advisors/Advocates
✓ Scientific/Lab Management
✓ Workforce

Audience Assumptions:

(assumed range is indicated by shaded cells)

		Novice		Practi-tioner		Expert
Education	Scientific	1	2	3	4	5
	BRM*	1	2	3	4	5
Expertise	Scientific	1	2	3	4	5
	BRM	1	2	3	4	5
Competence	Scientific	1	2	3	4	5
	BRM	1	2	3	4	5
BRM = "biorisk management". See definitions for terms in Resources section						

Language of instruction; translation or interpretation anticipated:

English (for design purposes)

Prerequisites

- Orientation to Biorisk Management
- Bioethics
- Developing, Performing, and Documenting a Biosecurity Risk Assessment
- Laboratory Biosecurity

Pre- or post-work required for completion

None

Certificates or documents of completion:

Certificates of completion will be provided

Preparation for future coursework

This lesson is not required for future coursework

Anticipated next steps

Learners will be prepared to conduct biosecurity risk assessments for their institutional field work as well as develop appropriate mitigation responses based upon the unique circumstances and constraints of the field environment. Learners will be able to apply biorisk management skills to help overcome these unique challenges. Depending on their needs assessment, learners will continue to take coursework in the skills &

competence track and integrate knowledge and experience from this course into their other coursework.

Instructional Environment

Number of Trainers/Staff required:	TBD depending on number of learners – optimal ratio is 1 trainer per no more than 12 learners
Trainer Qualifications:	Trainers must have completed BRM Curriculum Orientation. It is desirable for the trainer to also have completed the prerequisites for this course, and, if previously offered, the course itself. Also, trainers must be enrolled in the BRM training network.

Learning Environment

Media:	Instructor-led
Exercises & Activities	
Experience (Activists)	Learners will be asked to consider their experiences with their field work in regard to secure handling of biological agents and toxins
Reflection (Reflectors)	Learners will be asked to reflect on those experiences to help develop a model for effective, secure handling of biological agents and toxins in the field; learners will be asked to reflect on the next steps for working towards implementation of secure field practices in their work
Models (Theorists)	Learners will be able to derive, through their own experiences and reflections, the biorisk management AMP (Assessment, Mitigation, Performance) model to field biosecurity
Practice (Pragmatists)	Learners will conduct mock risk assessments of field biosecurity situations, and develop mock policies to address the risks. Learners will also describe next steps for developing and applying field biosecurity policies in their facility.

On-Site Specifics

Location	TBD
Room organization	Clusters of tables to facilitate small group (no more than 5 learners per group
Dress code and/or important cultural considerations	TBD

Instructional Materials

Equipment & Supplies	
Student Handouts	Student notes Glossary

Resources

Dependencies	• Laboratory Biosecurity Manual Template • Risk Assessment SOP • BTRP Principles of Biosecurity • BTRP Security Awareness • IBTR Controlling Laboratory Biorisks Course • IBTR Personnel Security within a Biosecurity Program
Authorities	
References	• CEN WS 55, 53 • DoDI 5210.89; "Minimum Security Standards for Safeguarding Biological Select Agents and Toxins" dated April 18, 2006 • Biosafety in Microbiological and Biomedical laboratories, 5th edition, 2009 • CWA 15793: Laboratory Biorisk Management standard • Laboratory Biosecurity Handbook (Salerno and Gaudioso) • WHO Biorisk management: Laboratory biosecurity guidance, September 2006 • Glossary of terms (in development)
Terms used in this document	• Knowledge – remembering the material in the same form as it was taught • Comprehension – learner's ability to understand the material by (for example) explaining or summarizing key messages • Application – ability to use the material in a new or given situation • Synthesis – ability to put together learning material in a new whole entirety. For example, using the material to create a new program or plan. • Evaluation – ability to judge the value of the material presented as a peer (to be able to critically advise or judge others on their application and synthesis of this learning material). • Novice – a person who is new to the circumstances, work, etc. in which s/he is placed; beginner • Practitioner – a person engaged in the practice of a profession; a person who practices something specified • Expert – a person who has special skill or knowledge in some particular field; specialist; authority; trained by practice • Education – the act of acquiring particular knowledge or skills, as for a profession • Expertise – the process of personally observing, encountering or

undergoing something; knowledge or practical wisdom gained from what one has observed, encountered, or undergone

- Competence – Possession of a suitable or sufficient skill, knowledge, experience, etc. for some specified purpose; properly qualified

Part II: Course Outline/Schedule							
Day	**Segment time (min)**	**Time**	**Topic**	**Instructional Method**	**Slide #**	**KM #**	**T/F**
KM = key messages ; T/F = teaching versus facilitation (instructor-based versus learner-based)							