

Workshop on Biosecurity Curriculum Development in Yemen

*23-25 February 2014
Addis Ababa, Ethiopia*



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Workshop on Biosecurity Curriculum Development in Yemen

Outline Day 1

- Welcome and Introductions
- Sandia BTR and Biorisk Management
- Biosecurity Curriculum Development Project
- Higher Education System and Curricula Update Process
- Lessons from Bioethics Education and Training
- Teaching models and approaches; examples and methods from the Global Biorisk Management Curriculum (GBRMC)



Page 2

Outline Days 2 and 3

- Teaching models and approaches; examples and methods from the Global Biorisk Management Curriculum (GBRMC) (Cont.)
- Identifying audience, context, priorities and formats
- Action plan for implementation and evaluation of education on biosecurity/biorisk management in current and next academic years



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Meeting Objectives

Goal: Discuss strategy to support introduction of biosecurity/biorisk management education in Yemeni universities

Objectives

- Present status of the Biosecurity Curriculum Development project and lessons from experiences of bioethics education
- Identify resources for education on biosecurity/biorisk management
- Identify targets, learning outcomes, formats and contents for biosecurity/biorisk management education
- Identify gaps and needs, and plans for addressing them in the current and next academic years in various faculties and universities
- Assign roles and responsibilities for follow-on phases



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Roundtable Introductions

- Your Name
- Your Position
- Your University, Faculty, Department



Sandia International Biological Threat Reduction

Sandia National Laboratories' International Biological Threat Reduction Overview



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International Biological Threat Reduction

Innovative Solutions for Countering Biological Threats Globally

- Promote the responsible use of biological agents, equipment, and expertise globally.
- Strengthen capacities to safely, securely, and responsibly detect, handle, and control dangerous biological agents.
- Improve understanding and management of the risks associated with accidental and deliberate misuse of biological agents.



IBTR Core Capabilities

- **Laboratory Biorisk Management**
 - Biorisk management standards and regulatory frameworks
 - Core biorisk management program documents
 - Lab design and programming expertise
 - Facility specific biosafety and biosecurity threat, vulnerability, and assessments
 - Biorisk (biosafety and biosecurity) upgrades
- **Biothreat Identification and Analysis**
 - Global analysis
 - Country and regional analyses
- **Capacity Building and Outreach**
 - Biorisk management training
 - Training centers
 - Law enforcement
- **Building inherently safer and more secure biomedical capabilities**
 - Surveillance and control
 - Public and vet health
 - Incident detection and response



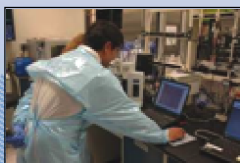
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Example: Technical Assistance to Bioscience Facilities

- **Biosafety and Biosecurity Risk Assessments**
 - Partnering with facility biosafety and biosecurity officers and/or institutional biosafety committees to conduct risk assessments
- **Comprehensive Lab Bio-risk Management**
 - Technical assistance in alignment with international standards, including as identified through risk assessments and gap analyses:
 - Institutional policies and procedures
 - Inventory systems
 - Personnel management programs
 - Physical security upgrades
 - Reviews of laboratory designs by lab planners and architectural and engineering specialists



Example: Building Human Capacity to Address Bio Risks

- **Global Bio-risk Management Curriculum**
 - Develop and maintain a customizable library of courses designed based on international best practices in bio-risk management and sustainable training techniques
 - Catalog: <http://biosecurity.sandia.gov/gbrmc/catalog.html>
 - Network of trainers to provide document and quality control and to offer a platform for shared experiences and problem solving
- **Conduct Training for Different Stakeholders**
 - Policy makers, lab workers, biosafety/biosecurity officers, lab directors, law enforcement
 - Topics include: bio-risk management, molecular diagnostics, infectious substance shipping, and biothreat identification and response
 - Training platforms include: classroom, distance-learning, lab, tabletop exercises, and full-scale field exercises
- **Development of Regional Training Centers**
 - Physical training centers and regional consortia
 - Train-the-Trainer programs
- **Support to International Organizations' human capacity efforts, including WHO, OIE, and INTERPOL**



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International Safeguards and Technical Systems

Mission:

Identify, develop, evaluate and deploy technical solutions in support of a national laboratories' global security mission.

Areas of Expertise:

- Information Assurance and Analysis,
- Intrusion Detection Sensors, Video, and Communication Technologies,
- Containment/surveillance Technologies,
- Systems Integration,
- Assessment,
- Training,
- Development.

Regions Engaged:

- Europe
- East Asia
- South America

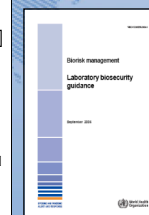
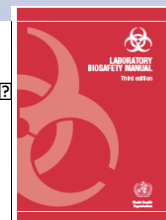


Terminology and Definitions

- Biosafety: The containment principles, technologies and practices that are implemented to prevent unintentional exposure to biological agents and toxins or their accidental release' (WHO, 2004)
- Biosecurity: Protection, control and accountability measures implemented to prevent the loss, theft, misuse, diversion, or intentional release of biological agents and toxins and related resources, as well as unauthorized access to, retention, or transfer of such material' (WHO, 2006)

¹Laboratory Biosafety Manual, third edition (World Health Organization, 2004)

²Biorisk Management Laboratory Biosecurity Guidance (World Health Organization, 2006)

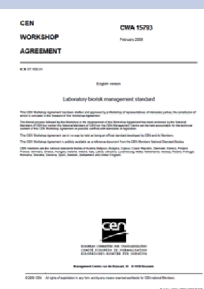


Definitions, Continued

- The practices of **biosafety** and **biosecurity** are combined into an **integrated effort** known as **biorisk management** where the goals are, concurrently, to work safely and to keep the work secure.

Biorisk management (BRM) can be further defined as the actions taken (by laboratories or facilities which handle, store, or dispose biological agents or toxins) to control or minimize biorisk to acceptable levels in relation to employees, the community and others, as well as the environment, which could be directly or indirectly exposed to biological agents or toxins (adapted from CWA 15793:2011¹).

¹Laboratory Biorisk Management Standard (CWA 15793:2011)¹⁰



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Definitions, Continued

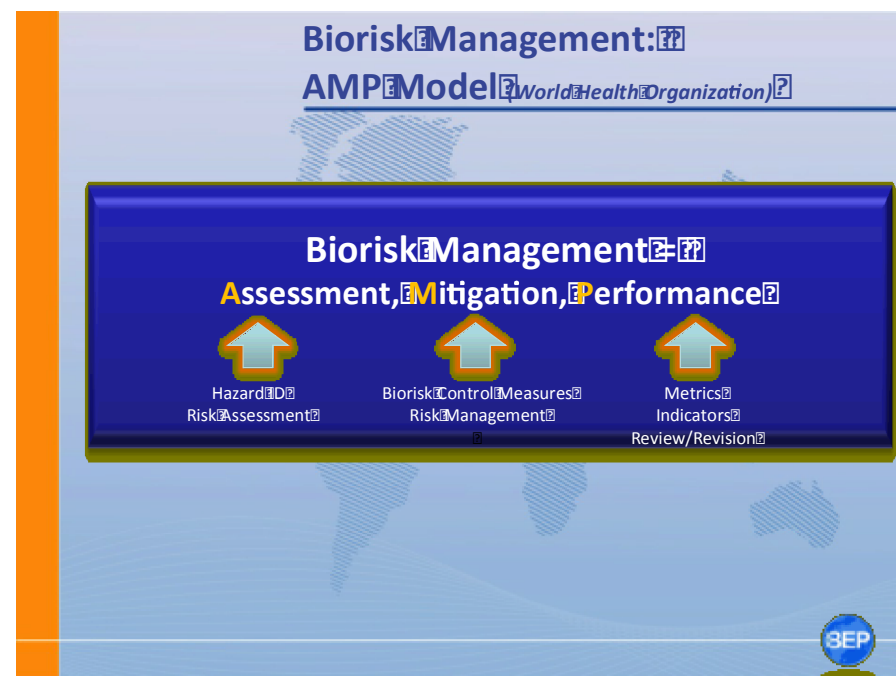
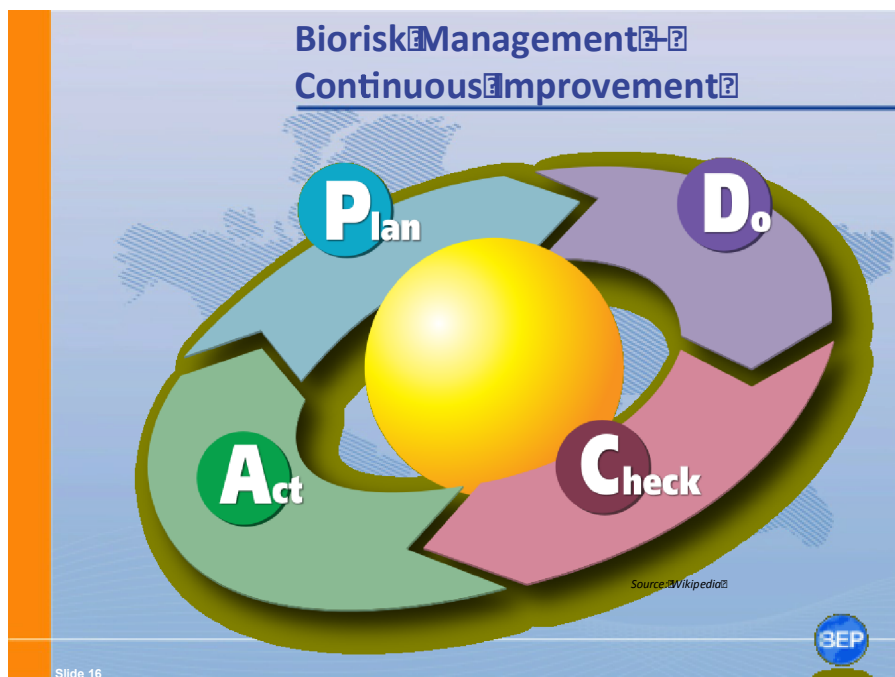
- “Dual Use” are legitimate goods and technologies that have the potential to be misappropriated and misused to cause harm

– Dual Use Research of Concern: “Research that...can be **reasonably anticipated** to provide knowledge, products, or technologies that could be **directly** misapplied by others to **pose a threat** to public health and safety, agricultural crops and other plants, animals, the environment, or material” [National Science Advisory Board on Biosecurity]



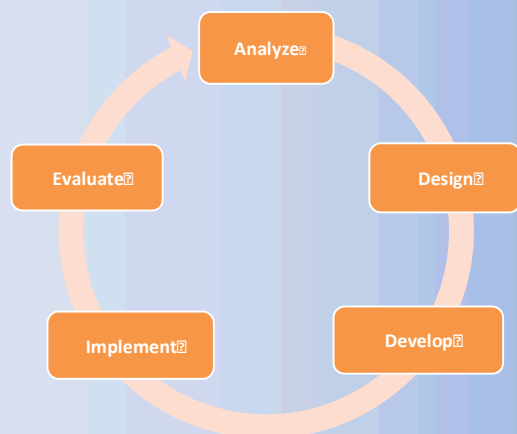
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Training Design Cycle



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Project Objectives

- Identify gaps, needs and learning objectives for biosecurity and biorisk management for pre-service scientists
- Design and develop educational materials and resources on biosecurity and biorisk management
- Support the implementation in higher education programs in Yemeni universities



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Project Phases

ANALYZE:

- Initial Survey (Sep-Oct 2013)
 - Needs for biosecurity, biosafety and biorisk management education at the undergraduate and graduate levels;
 - Course and curricula structures and reform processes with respect to content;
 - Opinions from educators on the relevance of topics and challenges they face with incorporating into teaching.
- Pre-Workshop Discussions (Jan-Feb 2014)

ANALYZE & DESIGN:

- Workshop (Feb 2014)

DEVELOP:

- Development of materials

IMPLEMENT & EVALUATE:

- Draft curricula implementation and evaluation (Feb-Dec 2014)

Project Phases Cont.

RE-ANALYZE, RE-DESIGN, RE-DEVELOP

- Further implementation, and support inclusion in curricula reforms & modernization (CY 2014-2015)



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Initial Survey on Biosecurity Curriculum Development

Undergraduate Biosecurity, Biosecurity and Biorisk Management Curriculum Development Questions

Please complete each question to the best of your ability, save it as a PDF, and email it to both monica@handa.ye and amr@handa.ye by September 30, 2013.

PERSONAL INFORMATION

If you would like to be part of the curriculum development process, please include the following:

Name: _____ Email: _____

Title/Position: _____

Employer/Affiliation: _____

CURRENT EDUCATION - BIOSAFETY, BIOSECURITY, AND RISK MANAGEMENT

Do undergraduate students currently receive instruction on biosafety¹, biosecurity², and/or biorisk management³?

☐ Yes ☐ No

If yes, to what extent (i.e., what specific topics are addressed, within what courses and degrees, are they classroom or laboratory-based, etc)?

1. Biosafety: the containment principles, techniques and practices that are implemented to prevent unintentional exposure to biological agents and toxins or their accidental release (WHO, 2004)

2. Biosecurity: Protection, control and accountability measures implemented to prevent the loss, theft, misuse, diversion, or intentional release of biological agents and toxins and related resources, as well as unintentional accidents, incidents, or transfer of such material (WHO, 2004)

3. Biorisk management: The actions taken by academics or facilities which handle, store, or dispose biological agents or toxins to control or minimize health or acceptable levels in relation to employees, the community and others, as well as the environment, which could be directly or indirectly involved in biological agents or toxins and encompasses both safety and security (OIE, 1976, 2011)

Handa National University is a non-governmental, non-profit organization established in 2004, which is a member of the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the World Health Organization (WHO). It is a member of the International Association of Universities (IAU) and the International Association of Agricultural Universities (IAAU).

Handa National University

If not, why? (check all that apply)

☐ These subjects are currently not a high priority compared to other subjects

☐ Lack of subject matter knowledge, teaching capacity/expertise

☐ Lack of teaching time in courses

☐ Other (please describe) _____

Do you or your academic programs use alternative concepts of biosafety/biosecurity?

☐ No, they are used in the context of prevention of harm from biological agents and toxins.

☐ Yes, they are used in the context of control of agricultural contamination.

☐ Yes, they are used in the context of protection of biodiversity.

☐ Yes, they are used in the context of GMO regulation.

Is ethics part of the average biology and/or medical curricula?

☐ Yes ☐ No

If yes, please provide examples of topics covered by ethics education.

Are students made aware of international or domestic regulations (legislation, codes of conduct) that prohibit the misuse of biotechnological sciences and materials for harmful purposes?

☐ Yes ☐ No

If so, which ones?

Have you ever attended any workshops, seminars or training on biosecurity, biosafety, biorisk management and/or dual use issues?

☐ Yes ☐ No

If yes, which ones? Could you incorporate what you learned into your teaching?

Initial Survey on Biosecurity Curriculum Development

PRIORITIES, CHALLENGES AND OPINIONS ON IMPLEMENTING NEW EDUCATION ON BIOSAFETY, BIOSECURITY, BIORISK MANAGEMENT

Based on the needs of your students, which topic areas do you think should be training priorities in the safety, security and risk management context? (check all that apply)

☐ Biosafety

☐ Biosecurity

☐ Lab safety and regulations

☐ Clinical lab safety awareness

☐ Control of hazardous materials

☐ Biorisk mitigation strategies

☐ Accident documentation and investigation

☐ Chemical safety

☐ Others (please describe) _____

How should a new biosafety/biosecurity/biorisk management curriculum be structured based on the course design and academic calendar? (check all that apply)

☐ Pre-recorded slides with informational informational guides. Instructors can pick and choose which to incorporate as needed into existing science lectures

☐ Short, 1 - 2 hour modules on various safety, security, ethics related topics

☐ Half day to full day modules

☐ Other format (please describe) _____

What would be an ideal frequency of training for undergraduate students on these subjects? (select one)

☐ A full introductory course at the beginning of a student's undergraduate program

☐ A module once a semester

☐ Short classes several times a month

☐ A few safety/security related ppt slides incorporated into appropriate existing lectures

☐ Other (please describe) _____

NEXT STEPS ON IMPLEMENTING EDUCATION

Can you describe the processes of approving/accrediting higher education programs at your University?

Who are the key decision makers (e.g., Heads of Departments, Faculty Deans, University Senate, Ministry of Higher Education and Scientific Research, etc) responsible for approving programs at your University?

Are bio (life sciences) higher education programs coordinated amongst Universities so that the curriculum is consistent throughout the country, and is this responsibility at the University or the Ministry level?

Multiple answers (check all that apply)

☐ There are no specific coordination mechanisms, each university is independent in its curriculum design

☐ There are coordination mechanisms, and they are managed at the academic level (associations of deans, regular meetings, etc)

☐ There are coordination mechanisms, and they are managed at the Ministry level (ministerial guidelines on curricula, accreditation, etc)

☐ Other situations (please describe) _____

If necessary, what would be the process of engaging the Ministry of Higher Education and Scientific Research to promote the integration of the curriculum around the country and who specifically should be engaged in the Ministry?

Are there possible anticipated challenges in the engagement with relevant Ministries?

(form continues on next page)

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Initial Survey on Biosecurity Curriculum Development

- Few undergraduate students currently receive some limited instruction on biosafety, biosecurity and/or risk management.
 - Biosecurity is rarely mentioned, if at all, in the education.
 - Reasons for lack of inclusion are absence of subject matter knowledge, expertise and/or teaching time, low priority compared to other subjects.
- Some respondents reported that ethics is part of the average biology and/or medical curricula.
 - No mention of ethical topics directly or indirectly related to misuse, dual use, or social responsibility related to dangerous pathogens.



Initial Survey on Biosecurity Curriculum Development

- Preferred options for the structure of education are short and flexible.
- Frequency of education: a full introductory course, or biannual modules, but also shorter modes of introduction, such as slides to be incorporated into existing lectures or short modules of two hours weekly.



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Survey on Biosecurity Curriculum Development

- The process of approving/accrediting higher education programs (new/modified curricula) requires approvals by Department, Faculty, University and finally by the Accreditation Council at the Ministry of Higher Education and Scientific Research (MoHESR).
- Respondents noted that they are supportive of the development and implementation of education in new/revised course formats within curricula on biosafety, biosecurity and biorisk management. The aim should be that the topics become requirements for all curricula implying lab work.

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Action Plan

By the end of this session, I would like to:

KNOW	FEEL	BE ABLE TO DO	
------	------	---------------	--

Your learning doesn't stop with this course. Use this space to think about what else you need to do or learn to put the information from this course into practice.

What more do I need to know or do?	How will I acquire the knowledge or skills?	How will I know that I've succeeded?	How will I use this new learning in my job?

Slide 3

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Objectives?

- **Know:**
 - Know the GBRMC and available resources
 - Know the ADDIE model for designing teaching
 - Identify target students (audience)
 - Identify format, teaching time, restrictions
 - Identify learning objectives
- **Feel:**
 - Confidence in identifying, designing and developing features for relevant biosecurity/biorisk management education in Yemeni universities
- **Be Able To Do:**
 - Design examples of outcome-based, topic-focused teaching materials

Slide 4



GBRMC?

GBRMC = Global Biorisk Management Curriculum?

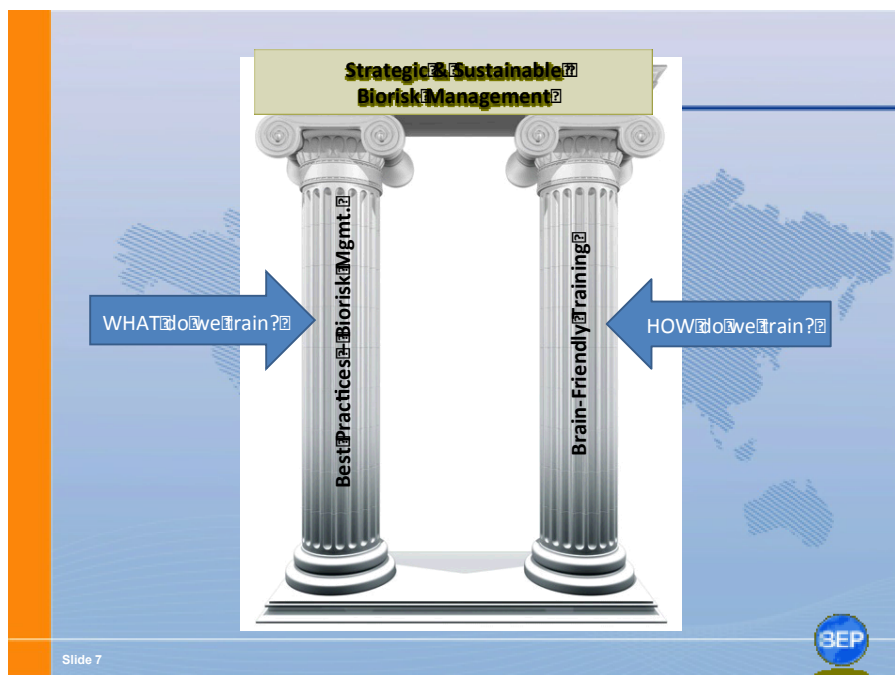
Mission?

- Biosafety & Biosecurity training materials?
 - Strategic
 - Sustainable
 - Anywhere, anytime
 - Well-branded
 - Well-managed

Slide 6



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Slide 7

Biorisk Management Resources

- CWA 15793:2011 Laboratory biorisk management standard (CWA 16393 guidance)
- CWA 16335 BioSafety Professional (BSP) Competences
- World Health Organization Laboratory Biosafety Manual
- World Health Organization Laboratory Biosecurity Manual
- OECD Best Practice Guidelines for Biological Resource Centres
- Guidelines for Biosafety Laboratory Competency (MMWR Supplement Vol. 60)
- NSABB Proposed Framework for the Oversight of Dual Use Life Sciences Research: Strategies for Minimizing the Potential Misuse of Research Information
- Biological and Toxin Weapons Convention
- Local Guidelines & Regulations
- Current best practices
 - example: U.S. Biosafety in Microbiological and Biomedical Laboratories

BEP

Slide 11

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Global Biorisk Curriculum Library, 1

Basic Track

Audience: All Personnel Involved in Biorisk Management

- Biorisk Management Basics
 - Orientation to Biorisk Management
 - Bioethics
 - Introduction to Dual Use Research of Concern
 - Biorisk Characterization & Evaluation
 - Biosafety Risk Assessment
 - Biosecurity Risk Assessment
 - Biorisk Mitigation Strategies
 - Introduction to Incident Management & Response

Laboratory-Level Track

Audience: Biorisk Management Advisors, Scientific/Laboratory Management, Lab Workforce

- Lab-Level Administrative Controls
 - Human Performance for Biorisk Management in the Laboratory
 - Developing, Evaluating, Validating, and Communicating Standard Operating Procedures
 - Hazard & Risk Communication in the Laboratory

Laboratory-Level Track, Continued

- Lab-Level Operational Controls
 - Biocontainment Facility Features
 - Engineering Controls and Laboratory Equipment
 - Good Laboratory Work Practices
 - Personal Protective Equipment
 - Decontamination
 - Biological Waste Disposal
 - Laboratory Biosecurity
 - Field Biosecurity
 - Shipping Infectious Substances and Biological Specimens
- Reporting, Monitoring, and Response
 - Incident Recognition and Response in the Laboratory

2

Slide 12



Global Biorisk Curriculum Library, 2

Management & Leadership Track

Audience: Policy Makers/Top Management, Biorisk Management Advisors, Scientific/Laboratory Management

- Policy, Planning, and Assessment
 - Writing and Communicating Biorisk Management Policy
 - Considerations for Training in Biorisk Management
 - Developing, Conducting, and Maintaining a Hazard Inventory
 - Identifying Legal Requirements that Impact BRM
 - Establishing Work Program Review & Approval
 - Establishing and Communicating Biorisk Management Goals, Objectives, Roles, and Responsibilities
- Developing and Maintaining Human Capacity for Biorisk Management (Managing People)
 - Managing Human Performance in the BRM Workforce
 - Establishing and Maintaining Formal and Informal BRM Mentoring Programs
 - Establishing and Maintaining Worker Health Programs
 - Developing and Maintaining Roles & Responsibilities for Risk-based Access to, Control of, and Accountability for Biological Agents and Toxins

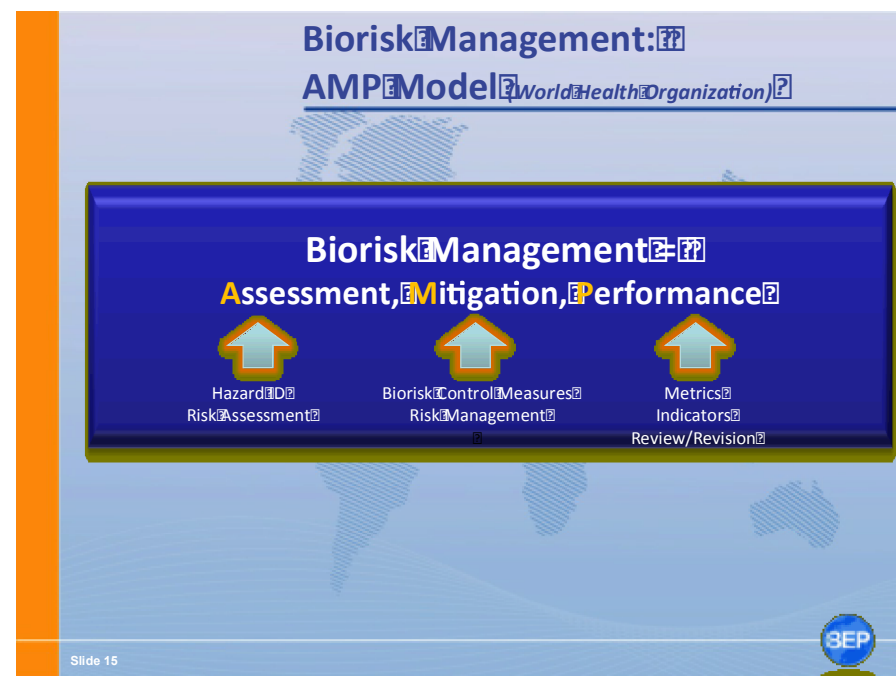
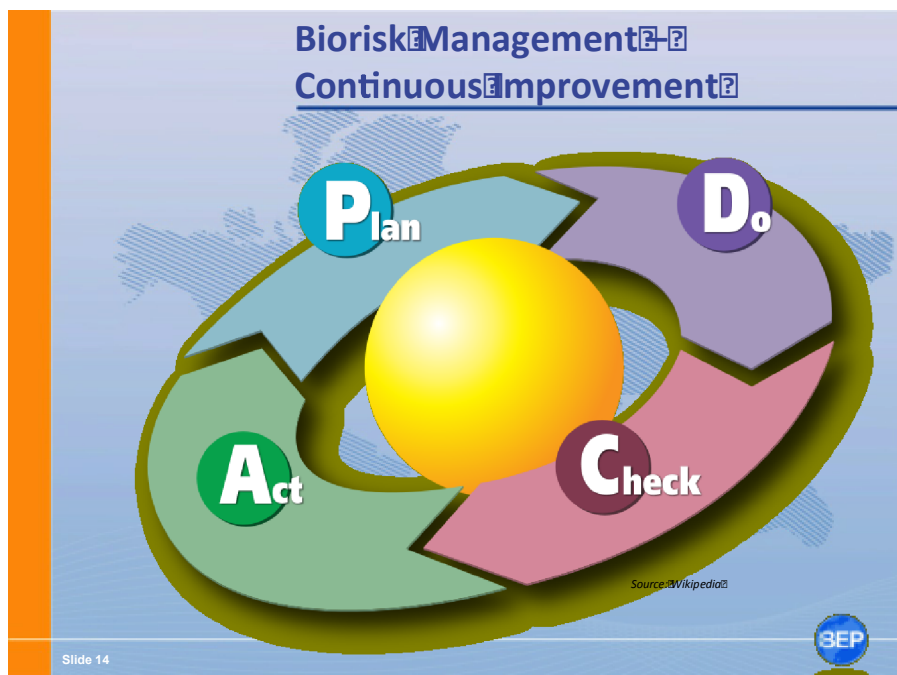
Management & Leadership Track, Continued

- Developing and Maintaining Physical Infrastructure for Biorisk Management
 - Understanding & Maintaining Facilities & Equipment for Biorisk Management
 - Basic Features & Maintenance for Physical and Information Security Measures
- Incident Management & Response
 - Incident Response Planning and Preparation
 - Incident Response Investigation
 - Incident Response Evaluation & Improvement
- Measuring and Improving Biorisk Management Performance
 - Measurement and Analysis of Biorisk Management System Performance
 - Conducting Audits and Inspections to Assess Biorisk Management Performance
 - Revising and Improving Biorisk Management System based on Performance Results
 - Establishing and Using Performance Indicators

Slide 13



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GBRMC Course Components

- Design Document
 - Course objectives, pre-requisites (for students & trainers), Course outline, etc.
 - Instructor's Guide
 - Detailed notes
 - Instructions and materials for interactive exercises
 - Handouts, if used
 - Slide Deck
- Student Guide
 - Student workbook
 - References & resources
 - Instructor and Student Evaluation materials
 - References & resources
 - Other materials as needed

Slide 16



GBRMC Components: Design Document (DD)

Part 1: Lesson Overview	
Lesson Description	
Overview	Orientation to Biorisk Management is intended to be the first course in a series of courses designed to provide a comprehensive understanding of the principles and terminology of Biorisk and management systems and to build a common conceptual framework for managing these interconnected components. BIA, a part of the course, is the first.
Scope	This course will provide an overview of biorisk management, from the management of biological agents to the management of food safety and food security. It will also provide an overview of the management of food safety and food security. It will also provide an overview of the management of food safety and food security.
Learning Level	Intermediate
Length of Course	4 hours
Lesson Objectives	At the end of this lesson, learners will be able to: • Understand what "biorisk management" means • Be prepared to implement a biorisk management system
Instructional Objectives	• Explain what a management system is and what the benefits are of having a management system • Define a biorisk management system as a system that manages the risks of biological agents, food safety, and food security • Identify the key components of a biorisk management system • Describe the role of the management system in the management of food safety and food security • Explain the role of the management system in the management of food safety and food security
Personal Objectives	• Understand what a management system is and what the benefits are of having a management system

- Part 1:
 - Lesson Overview
 - Student Description
 - Instructional Environment
 - Resources
- Part 2:
 - Course Outline

Slide 17



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GBMRCE Components:?? Slide Deck (SD)??

Slide 18: GBMRCE Components: Slide Deck (SD)

The slide displays a grid of 12 slides from the GBMRCE Slide Deck (SD). The slides are organized into four columns and three rows. The first column contains slides 1, 2, 3, 4, and 5. The second column contains slides 6, 7, 8, 9, and 10. The third column contains slides 11, 12, 13, 14, and 15. The fourth column contains slides 16, 17, 18, 19, and 20. The slides cover topics such as Introduction, Lesson Objectives, The AMP Model, Risk Mitigation, Why Risk Assessment?, Group Exercise Step 1, Categories of Control Measures, Group Exercise Step 2, Elimination or Substitution, Group Exercise Step 3, Advantages and Limitations, and Group Exercise Step 4.

Slide 18

GBMRCE Components:?? Instructor Guide (IG)??

Slide 19: GBMRCE Components: Instructor Guide (IG)

The slide displays a grid of 2 slides from the GBMRCE Instructor Guide (IG). The first slide is titled "What is biorisk management?" and includes a "Small group activity (15 minutes)" section. The second slide is titled "What is biorisk management?" and includes a "Primary Discussion (10 minutes)" section. The slides cover topics such as Biorisk Management: the AMP Model, Background information for instructor, and Management System.

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GBRMC Components: PP Student Guide (SG)?

Orientation to Biorisk Management

Components of Biorisk Management

Assessment

Integration

Performance

The AMP Model

Define biorisk management system (the next activity may help you construct your definition).

Describe an AMP model:

Slide 20



GBRMC Components: PP Evaluations (Level 1, 2, 3)?

General?

Course Specific?
Know, Feel, Do?

Level 1 General Evaluation
(Course or Training Event Name)

1. I am satisfied with the training event.

Strongly Agree Agree Neutral Disagree Strongly Agree

Level 2 General Evaluation
(Course or Training Event Name)

1. Were the prerequisites and the course description adequate for the course? If not what would you change?

2. How were the trainees identified for the course? Based on facility staffing plans was this course appropriate for students or were there trainees in attendance that did not require the course?

3. Do you believe the course matched the trainer's expertise and knowledge base?

4. Were there any cultural limitations associated with the training? Language or translation issues? Jargon problems?

5. Based on your assessment of the training event would you recommend any follow up for the cohort or any individual students?

6. Were there any additional materials used for demonstration or instruction that were useful to the course?

7. Were there any issues with CBEF approved training curriculum? Content errors? Partner Nation capabilities?

8. Were there any unexpected events that altered the flow of the training event. If so what were the effects on the course? What steps were taken to reduce the impact of specified events?

9. Did the students stay engaged and attentive throughout the majority of the class? If so, what sections of the course lagged? What activities were more successful than others? Less successful?

Level 3 Know-Feel-Do Evaluation
Personal Protective Equipment

After this course, I know:

1. I know Objective 1. What PPE is used and what each type of PPE is used for.

Level 2 Evaluation
Measurement of Learning (as specified by course objectives) during course (completed by instructor(s)).

Completed by: Instructor(s)

Know, Feel, Do

Was this demonstrated by all students?

None

AP 100% 75% 50% 25% 0%

What PPE is and what each type of PPE is used for

Participation in course exercises and lab activities

Which types of PPE are appropriate for different settings and risk levels

Participation in course exercises and lab activities

Specific procedures for use and maintenance

Participation in course exercises and lab activities

How to integrate the use of PPE into current laboratory procedures

Participation in course exercises and lab activities

Confident that suitable PPE has been chosen for laboratory procedures and activities

Participation in course exercises and lab activities

Confident that proper PPE use and maintenance is understood by all those in the laboratory

Participation in course exercises and lab activities

Demonstrate different types and uses of PPE

Participation in course exercises and lab activities

Write laboratory procedures that include the use and maintenance of PPE

Participation in course exercises and lab activities

Appropriate to that procedure

Participation in course exercises and lab activities

*If instructor(s) feel that there is a student(s) who did not demonstrate the stated learning objectives, please list the names and reasons for concern regarding demonstration below (names will not be published to the Partner Network).

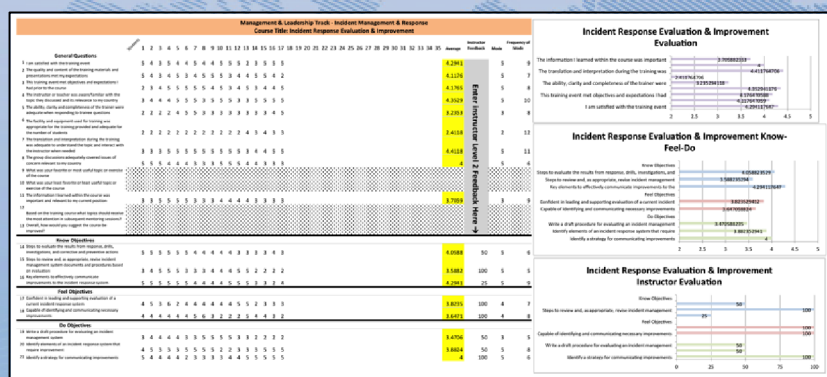
Name of student

Comments regarding demonstration of learning objectives

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GBRMC Components: Evaluation Analysis Tools

Spreadsheet to Enter Evaluation Data
Pre-made Graphs



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Public Access Site

- <http://biosecurity.sandia.gov/gbrmc>

Slide 23

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GBRMC Pillars & Training Techniques

- So what's different?
 - Experiential Learning
 - Small group and plenary activities
 - Breaks
 - Movement & colors
 - Debriefs, recaps
 - Outcome based
 - What do you have?
 - Where do you want to go?

Slide 24



GBRMC Pillars & Training Techniques

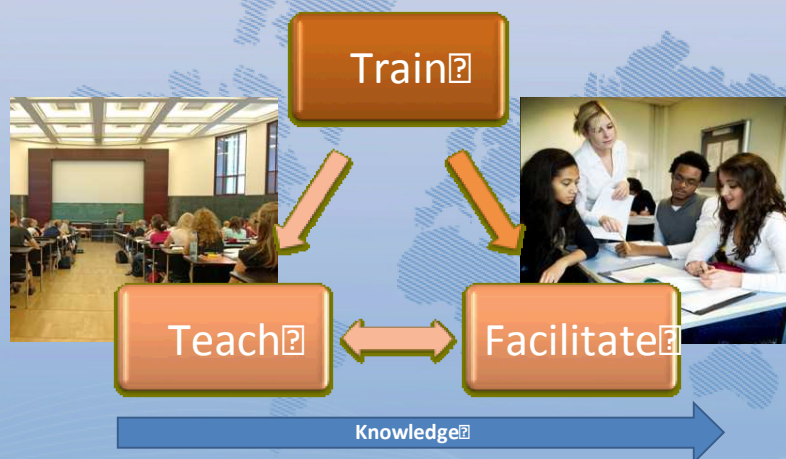
- So what's different, continued?
 - Implementation "Blind"
 - No specific training scenarios anticipated
 - Comprehensive Toolkit
 - Detailed design document and instructor guide
 - Student guide and key references
 - Evaluations
 - Leave your fingerprints
 - Trainers' network to capture feedback, solutions, configurations, customizations, revisions, translations, etc.

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Facilitate versus Teach



Activity Options

- | | |
|---|---|
| <ul style="list-style-type: none">• Individual Work• Pair Work• Small Groups• Interactive Lecture• "Spin-off" Discussions | <ul style="list-style-type: none">• Brainstorming• Games• Video• Case Study• Role Play• many more... |
|---|---|
- Slide 27

Workshop on Biosecurity Curriculum Development in Yemen

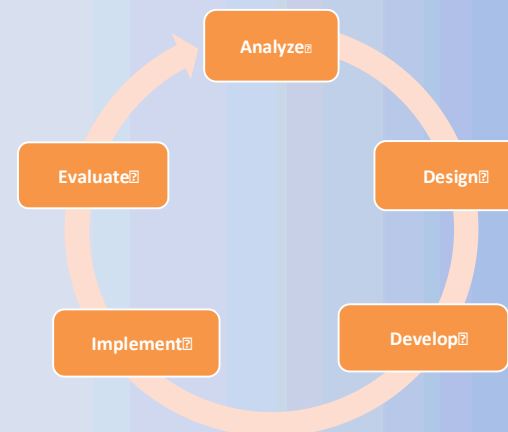
Analyze, Design, Develop,
Implement, Evaluate

How to tailor resources to the Higher
Education Context in Yemeni
Universities?

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Training Design Cycle

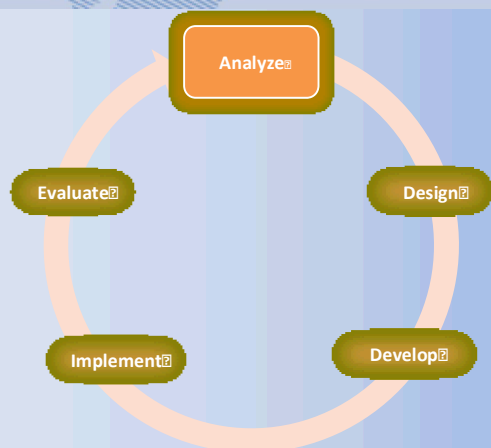


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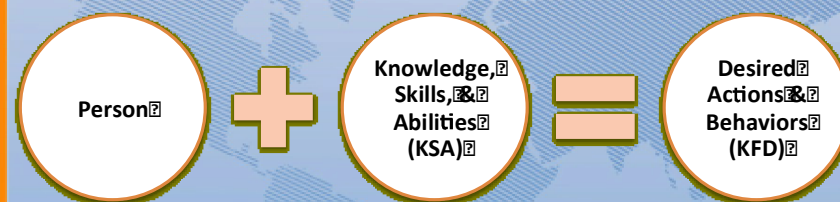
Training Design Cycle



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Why do we train?



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Workshop on Biosecurity Curriculum Development in Yemen

Activity: Audience/Target
Students

Question: Who should be knowledgeable of biosecurity, bio risk management?

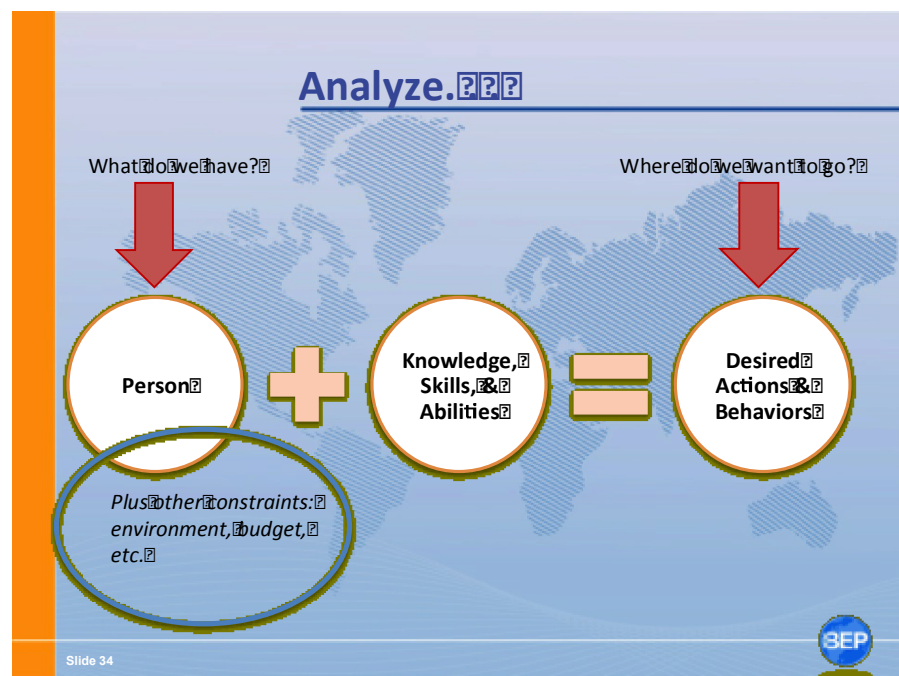
Think to: level (undergraduate, graduate); degree/specializations, job perspectives...

As a group, take 10 minutes to brainstorm... write on separate sticky note.

3EP

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Activity: Situation, local resources and constraints

Question: What factors would impact, influence or limit introduction of teaching biosecurity/biorisk management in higher education?

Think of current features of higher education: available teaching time in curricula; knowledge of the subject; students' cohort sizes; teaching formats (active/experiential, lectures, activities, etc)...

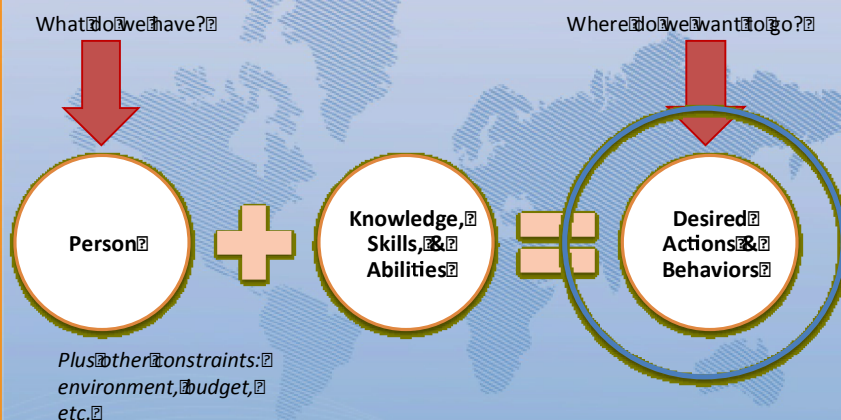
As a group, take 10 minutes to brainstorm. Write on separate sticky note.

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Analyze.???



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Where do we want to go??

- Organizational
- Instructional
- Personal
 - Know
 - Feel
 - Do



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Levels of Learning

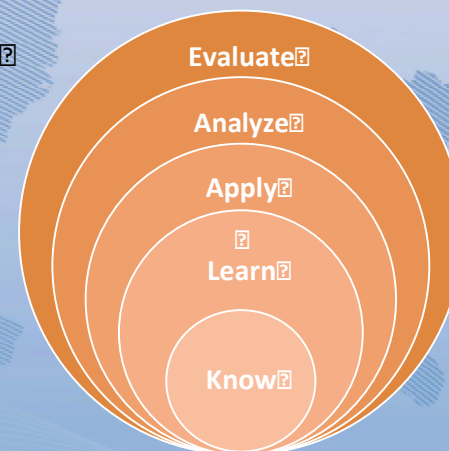
Level	Goal
Evaluate	Make judgments about the value of ideas or materials.
Analyze	Use concepts and models from training to create new use.
Apply	Applies what was learned in the classroom into novel situations in the workplace.
Learn (Comprehend)	Understand the meaning, translation, interpolation, and interpretation of the training. State a problem in one's own words.
Know	Remember material in the same form as it was taught.

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Analyze Goals & Objectives

Bloom's Taxonomy of Cognitive Domains



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Levels of Learning

Level	Example Verbs for Objectives
Evaluate	assess, judge, defend, predict, support
Analyze	examine, compare, critique, categorize, experiment
Apply	demonstrate, use, perform, measure, solve, build
Learn (Comprehend)	explain, describe, restate, classify, recognize
Know	list, memorize, define, recall, label

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Know-Feel-Do

“People will forget what you say.
People will forget what you do.
But people will never forget the way you made them feel.”
– Maya Angelou

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For Example: KFD Objectives

- **Know/Knowledge:**
 - ...
- **Feel/Skills:**
 - ...
- **Be Able to Do/Abilities:**
 - ...

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Activity Learning Objectives

Activity: Determine what you would like student to KNOW, FEEL, and BE ABLE TO DO once they receive biosecurity/biorisk management education.

As a group, take 10 minutes to brainstorm and write on separate sticky notes.

?

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Know-Feel-Do	
After biosafety and biosecurity education, the student will:	
Know	
Feel	
Be Able to Do	

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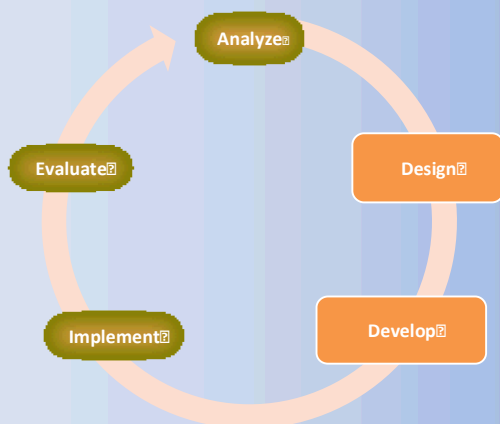
Analyze				
Students (Levels/Courses)	Time	Format	Other factors	Learning Objectives (KFD)

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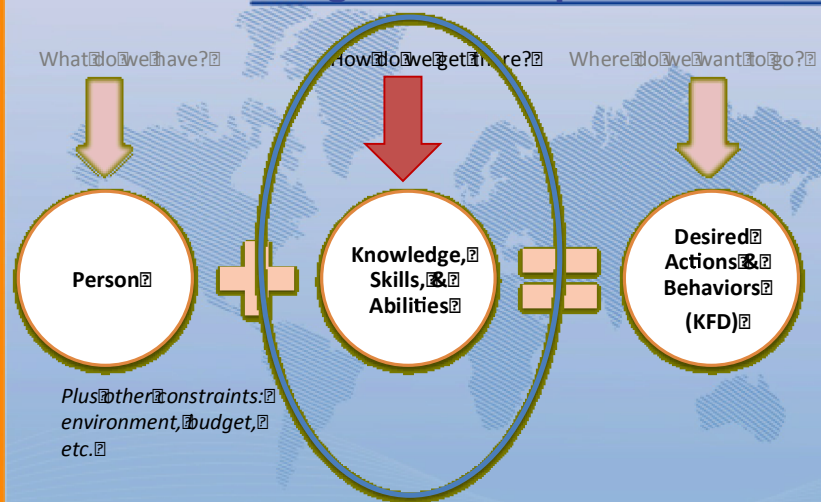
Training Design Cycle



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Design & Develop



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Design & Develop

- Identify sources and resources
 - Existing experiences in Yemeni Universities
 - GBRMC
 - Other external resources

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Design & Develop



Configuration

matching objectives between training needs and resources

Customization

Adding course materials to address additional objectives not met by existing resources



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Configuration Example

- Training Need:
 - 2 day course introducing biorisk management, risk assessment, biorisk mitigation strategies, and biorisk management performance indicators
 - Example using GBRC courses:



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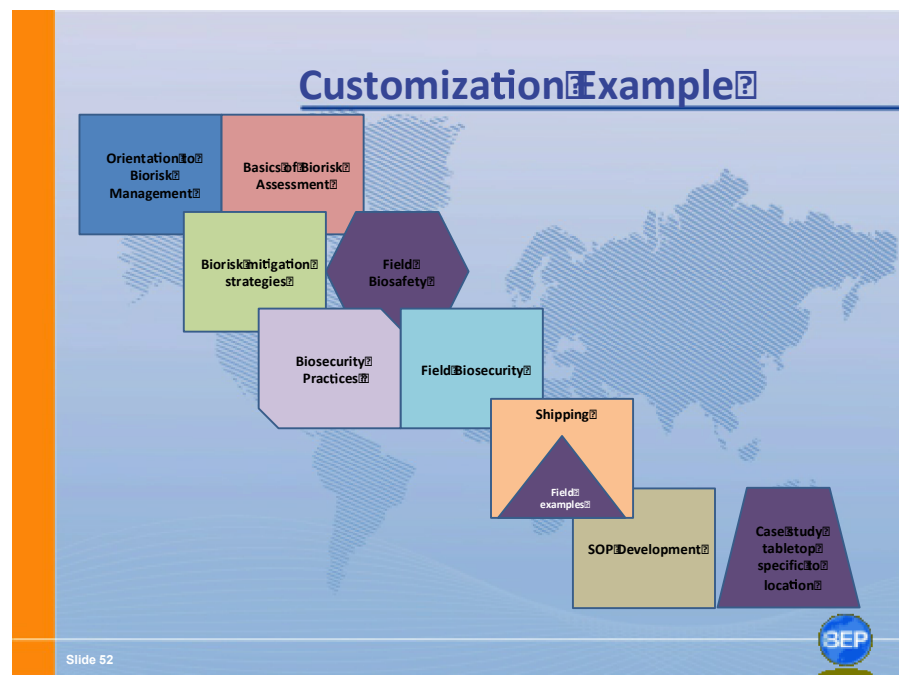
Customization Example: FETP

- Training Need:
 - 1 week biosafety and biosecurity module for Field Epidemiology Training Program

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Activity 1: Design & Develop

Activity:

Using the

- KNOW, FEEL, DO results from the previous exercise,
- the sticky notes with training components, resources identified in Day 1 and Day 2 and
- the KEY MESSAGES cards from various resources.

match the cards to as many audience/learning objective sticky notes couples as possible.

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Options for Customization

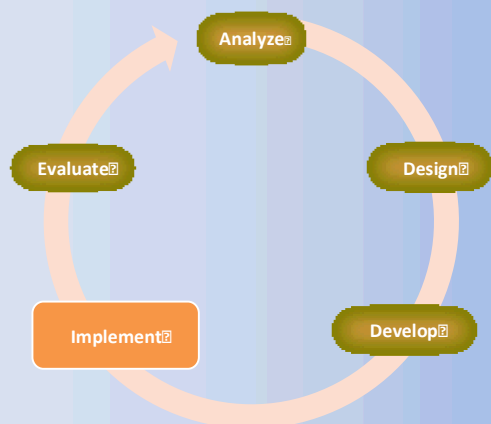
- Demonstrations
- Guided Exercises (tabletop, drills, SOP development, hands-on technique, etc.)
- Tours
- New courses with locally specific information:
 - Legal requirements
 - Facility & equipment specifics, etc.
- Replacement of existing resources of case studies and examples with locally specific examples.
- Others?

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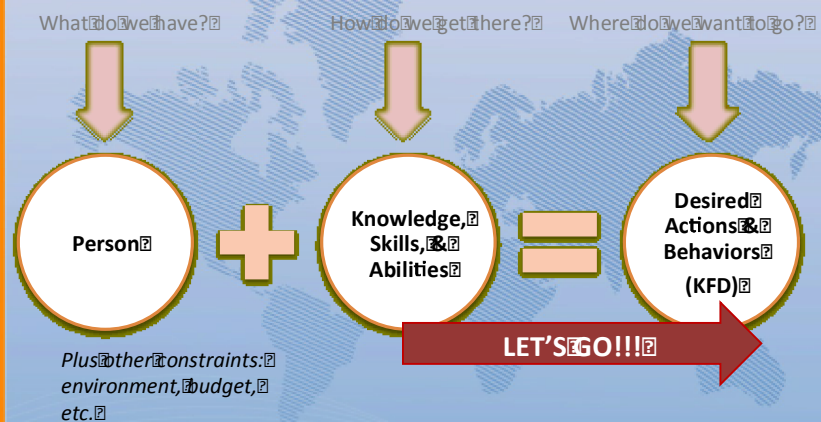
Training Design Cycle



Slide 3



Implement



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Implement & Prioritization

- Plenary Discussion
 - Which learning objectives matched with existing resources and sources are **more easily implementable**?
 - Think about current strengths, capacity, levels of students, etc.



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From Develop to Implement

- Plenary Discussion
 - How to develop materials?
 - Testing materials in Universities in 2014?



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Plan for Development and Implementation

- A plan for development of materials and their implementation
- Think about tasks that need to be accomplished, who should do that (roles) and a timeframe
- Tasks should be SMART
 - **S**pecific
 - **M**easurable
 - **A**ttainable
 - **R**easonable
 - **T**ime-based

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Plan for Development and Implementation

Activity 1: What tasks need to be done to start teaching in your courses?

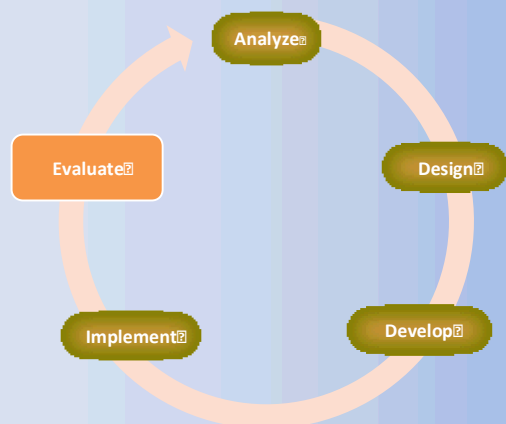
- In your groups
 - Think to all tasks needed to develop materials and implement them in teaching
 - Tasks should be SMART
 - Use your Worksheets

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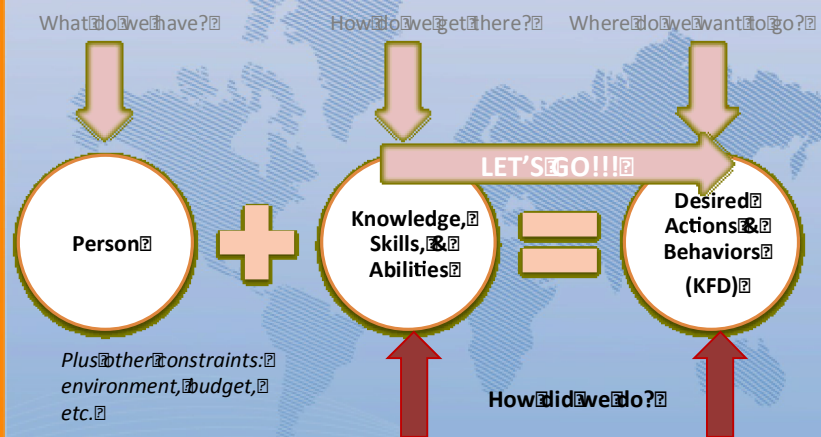
Training Design Cycle



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Evaluate



Slide 10

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Evaluate Students' Objectives Four Levels*

- Level 1
 - Was the student **happy** with the course?
- Level 2
 - Did the student **learn**?
- Level 3
 - Over time, did the student's **behavior** change to meet the desired objective?
- Level 4
 - Over time, did the **organization** see **improvement** in biorisk management?

*(Donald) Kirkpatrick Learning Evaluation Model



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Evaluate Draft Materials

- Plenary Discussion
 - What evaluation tools do we need for educators to evaluate effectiveness and appropriateness of draft materials?



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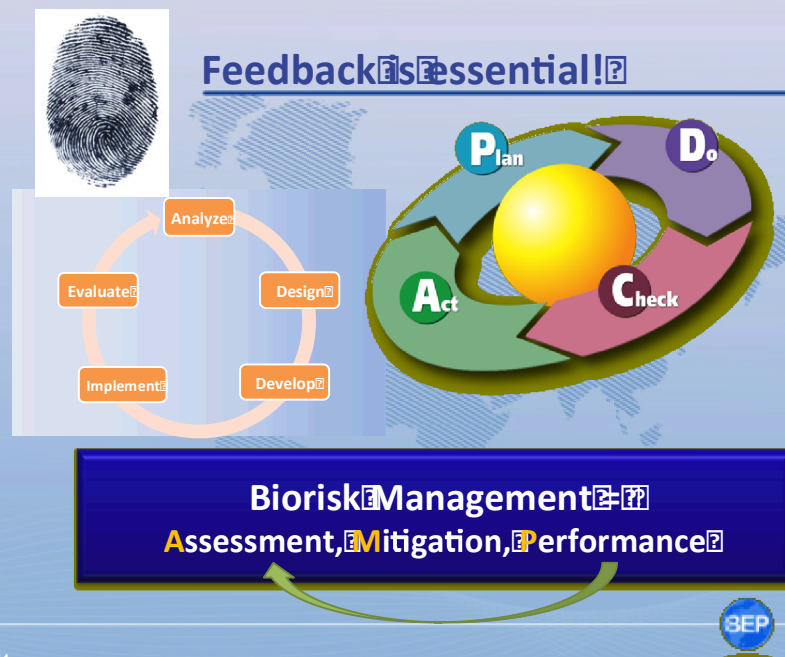
Evaluations & Instructor Debrief Feedback on Teaching Design and Development

- Critical to ongoing success of biorisk management training and capacity building
- Evaluation strategy should be common
- Changes and additions to training materials will be based on these documents



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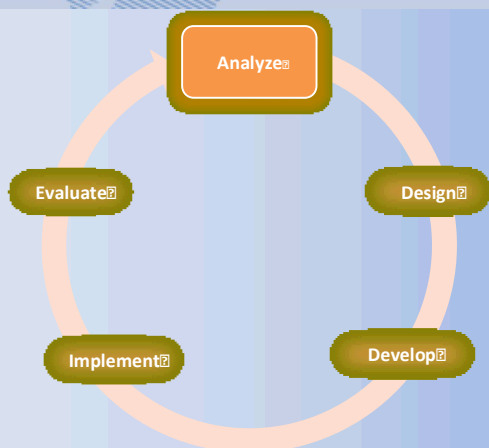
Feedback is Essential!



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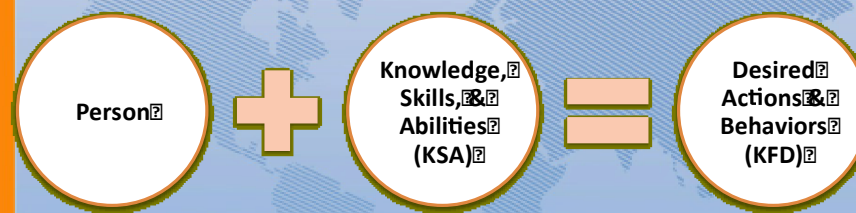
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Training Design Cycle



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Wrap-Up



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Action Plan to Support Implementation Tests in 2014

- Assemble guidelines and Action Plan to support introduction, on an experimental basis, in 2014
- Identify goals and evaluation means for 2014
- Should the Action Plan be common or different for each university/faculty? Depends on needs and gaps

?



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Action Plan to Support Development and Implementation

Students (Levels/ Courses)	Time	Format	Learning Objectives (KFD)	Resources	Needs and Gaps to Overcome	Tasks	Roles	Time

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Longer Term Perspectives

- What interest and perspectives for AY14/15 and beyond?
- How to include biosecurity/biorisk management in curricular reform processes?

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