



Midwest Research Institute

solutions through science and technology

Biological Safety Training Using a Standardized Approach

Patricia Delarosa, PhD RBP CBSP
Midwest Research Institute



Biosafety Training Needs

- United States
 - Standardized training as part of a Personal Reliability Program (PRP)
- International
 - Development of standardized biosafety programs



Biosafety Officer Training Design

- Every person working in a research institute or clinical laboratory has biosafety responsibilities
- All work in a biological research facility has a biological safety component



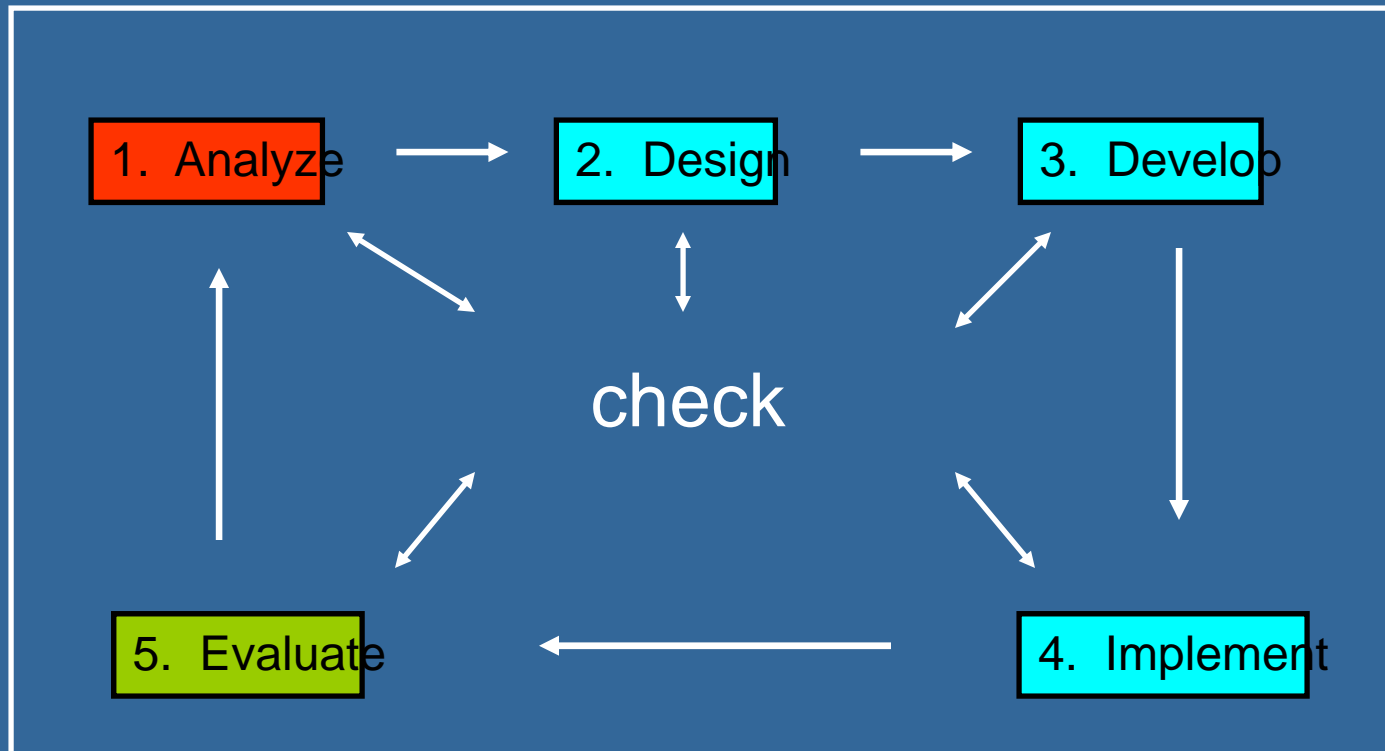
Training Standardization

- Identification of core competencies
- Application of performance metrics
- Capability verification

Core Skill	Metric	Evaluation
Task 1	Exam	Test Score
Task 2	Demonstration	Check List
Task 3	Inspection	Compliance/Time



Instructional Systems Design (ISD) Model

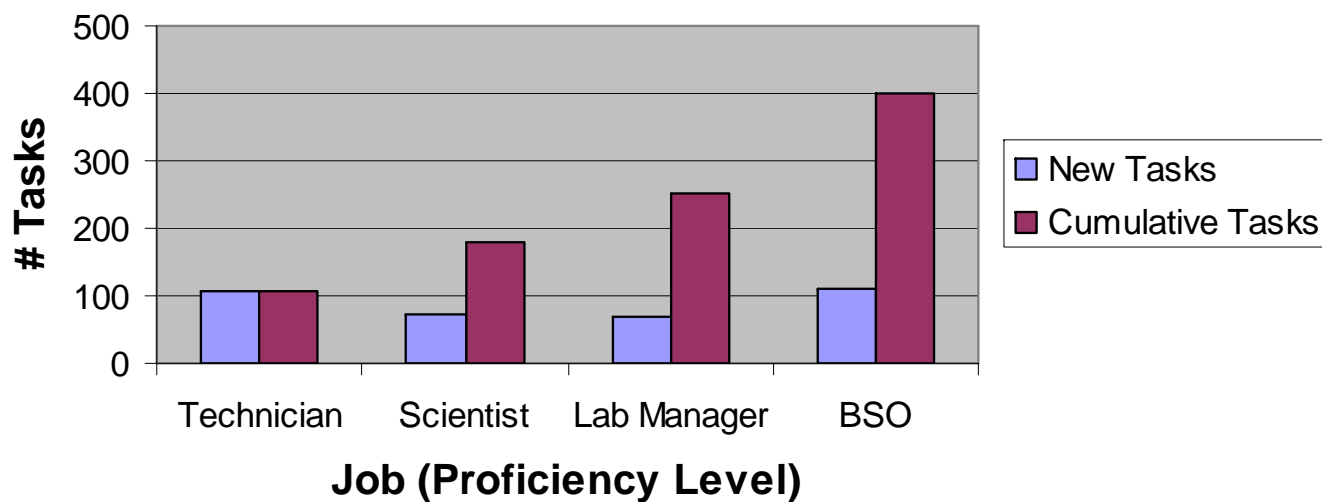


LEGEND: Curriculum Loop →
Feedback Loop ↔



Training Analysis

Biosafety Subtask Distribution and Proficiency Requirements





Training Analysis

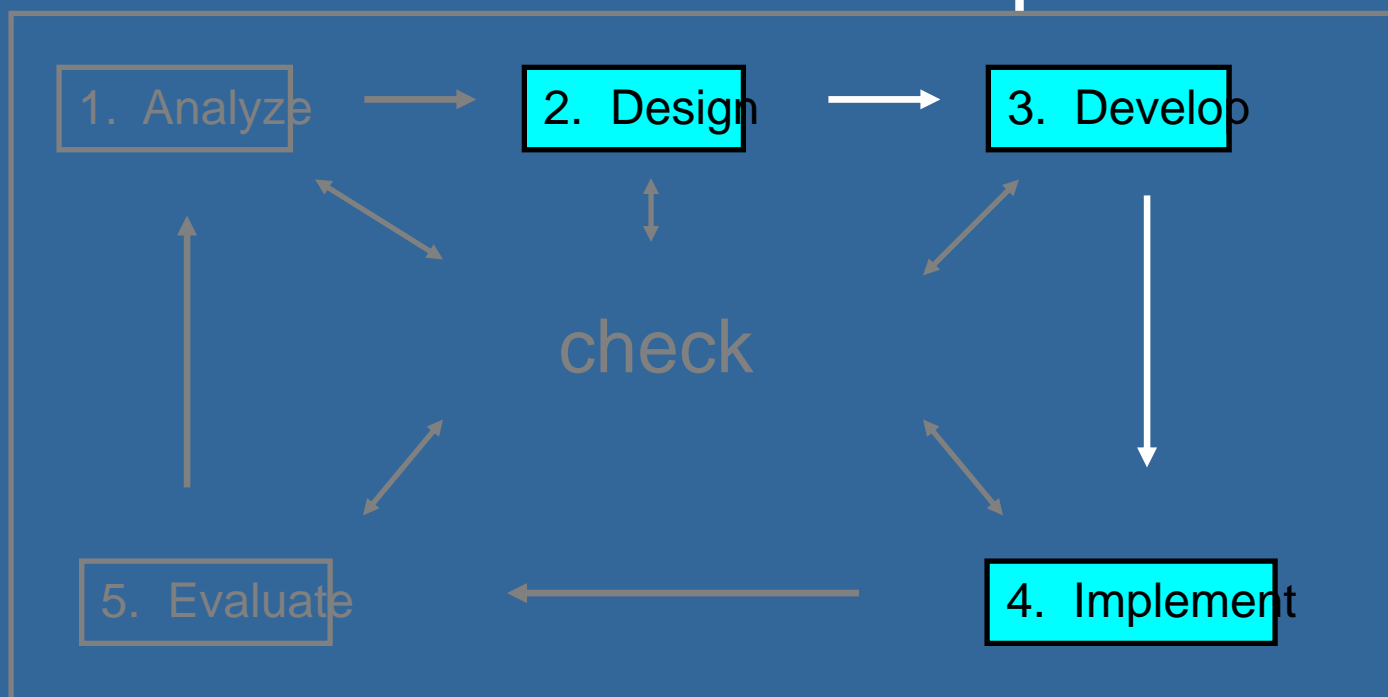
Task Analysis by Job

Job/Proficiency Level	Percent of Total		
	Basic	Instructor	Management
Technician (required)	100%		
Scientist	94%		6%
Lab Manager	14%	23%	63%
BSO		22%	78%

Percentages out of 399 total biosafety principles and practices identified for BSL-2



ISD Training Design, Development and Implementation



LEGEND: Curriculum Loop 
Feedback Loop 

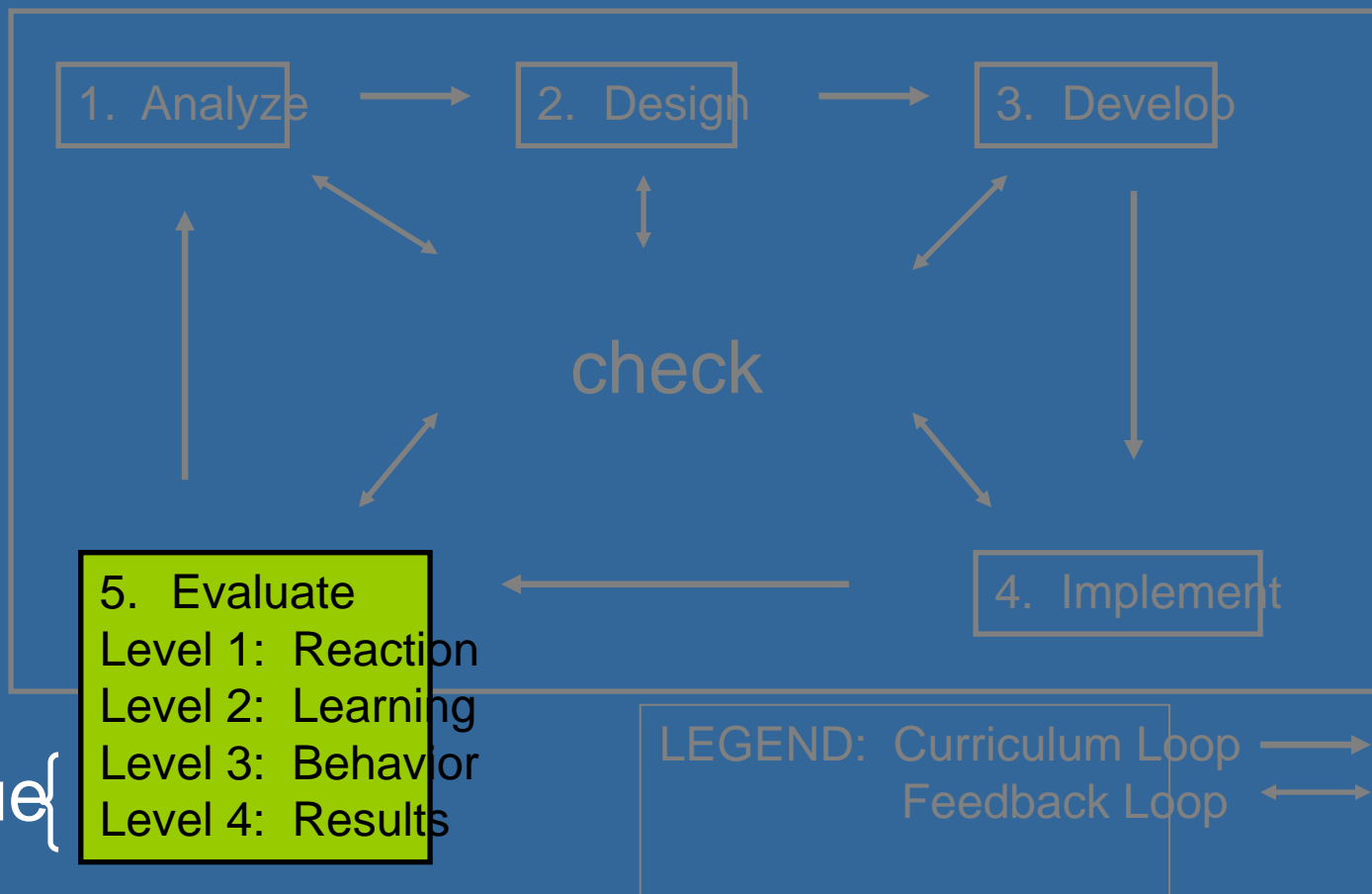


Biosafety Officer Training Development and Implementation

- Management Training
 - Focus: Institute specific biosafety programs
 - Outcome: Design of institute-specific biosafety manuals and programs based on local and international regulations
- Instructor Training
 - Focus: Train local biosafety instructors to design and implement institute specific biosafety training programs
 - Outcome: Classroom and laboratory biosafety instructors



ISD Evaluation



Unique



Biosafety Management Training Evaluation

Program metrics:

- Level 1: Student reaction
- Level 2: Materials
- Level 3: Implementation
- Level 4: Audit (Task-based)

STUDY GUIDE FOR PROGRAM AUDIT	
Audit Score out of 16 Total Points	
REQUIREMENT	ASSESSMENT
Copy of the Institute Biosafety Manual complete and accessible to institute personnel and the Institute Biosafety Committee	<ol style="list-style-type: none">1. Document submitted for Audit2. Document complete3. Document modified to be institute specific4. Institute-specific Biosafety Manual used by the Institute Biosafety Committee
Copy of Emergency Response Protocols complete and available in each laboratory	<ol style="list-style-type: none">1. Document submitted for Audit2. Document complete3. Document modified to be institute specific4. Evacuation and response procedures practiced by staff
Copy of Bloodborne Pathogens document complete and available to all personnel	<ol style="list-style-type: none">1. Document submitted for Audit2. Document complete3. Document modified to be institute specific4. Document review schedule established
Copy of Chemical Hygiene Plan complete and available to all personnel	<ol style="list-style-type: none">1. Document submitted for Audit2. Document complete3. Document modified to be institute specific4. Document review schedule established



Instructor Training Evaluation

Program metrics: (BSO Instructor Training)

- Level 1: Student reaction
- Level 2: Materials
- Level 3: Demonstration of Capability
- Level 4: Audit

Student metrics

- Level 1: Student reaction
- Level 2: Classroom grade
- Level 3: Assay competency
- Level 4: Demonstration of Capability

Presenter metrics

- Level 1: Student reaction
- Level 2: Materials
- Level 3: Demonstration of

SCIENTIST LEVEL DEMONSTRATION OF CAPABILITY EXAM	
TEST DAY 1	
Instructions for the Written Exam	Risk Assessment and Risk Mitigation
Candidates should use the Serology Standard Operating Procedures to fill out a Hazard Identification Form and conduct a Risk Assessment. Include procedural changes required for mitigation of identified risks.	
TEST DAY 2	
Complete the procedures outlined in the SOP. In this procedure, you will be evaluated on the following skills:	
<ul style="list-style-type: none"> Ability to work safely in the biosafety cabinet Knowledge of waste handling and decontamination procedures Good Microbial Technique Use of Personal Protective Equipment as described in the risk assessment Knowledge of Bloodborne Pathogens and Exposure Control procedures described in the Institute Biosafety Manual Aseptic Technique 	



Evaluation Summary

- Links training to tasks performed on the job
- Integrates existing biosafety training with practical training
- Applies standards to training and biosafety program
- Promotes and supports biosafety programs and biosafety instructors



Conclusion

Because of the institute-specific nature of a sound biosafety program, standardization of biosafety training should focus on providing the Biosafety Officer and Laboratory Managers with standardized methods to evaluate need, develop training and measure success.