



<b>Profession</b>	<b>BIOLOGICAL SAFETY PROFESSIONAL (BSP) also referred to as Biological Safety Officer (BSO)</b>	
<b>Competency Definition</b>	<b>Ability to identify, assess, and control occupational health risks associated with exposure to biohazardous agents and materials and to develop programs to manage these risks. Biohazardous agents are infectious agents that include: bacteria, viruses, fungi, protozoa, multicellular parasites, prions (proteins), and certain types of recombinant DNA. Biohazardous materials include: human and/or other animal blood, body fluids, tissues that contain biohazardous agents; <i>in vitro</i> cell or tissue cultures of biohazardous agents, and toxins that cause disease in humans and/or other animals and are derived from various biological sources including certain biohazardous agents.</b>	
	<b>DEVELOPING BSO</b>	<b>BSO CORE COMPETENCIES</b>
<b>Skills</b>		
<p><b><u>Actively engages in the following activities:</u></b></p> <ul style="list-style-type: none"> <li>• Prepares and maintains a biosafety manual and site exposure control plan (ECP)</li> <li>• Reviews project proposals and provides advise on biosafety issues</li> <li>• Advises on occupational health programs for persons working with biohazardous agents and materials</li> <li>• Provides and interprets biosafety regulations, guidelines, resources and reference information.</li> <li>• Provides and interprets institutional biosafety compliance programs and audits their effectiveness</li> <li>• Institutes, evaluates and documents biosafety training</li> <li>• Identifies biohazardous agents and materials in his/her institution and maintains an inventory</li> <li>• Develops and implements an infectious-medical waste management program.</li> <li>• Provides technical information and advice on new technologies impacting biological safety</li> <li>• Develops and recommends biosafety practices</li> <li>• Interacts with other safety areas such as chemical safety or radiation protection</li> <li>• Inspects/maintains Personal Protective Equipment (PPE) and emergency response equipment</li> <li>• Plans for biological emergencies and develops procedures to address them</li> <li>• Conducts risk assessments to determine how to work safely with biohazardous agents and materials and mitigate biosafety and biosecurity risks</li> <li>• Prepares biohazardous agents and materials for shipping/receiving in accordance with import/export regulations</li> </ul>	<p><b><u>A “Competent BSO” can effectively do the following:</u></b></p> <ul style="list-style-type: none"> <li>• Design and implement biohazardous agent programs to meet current regulatory and institutional requirements</li> <li>• Identify and manage biosecurity risks</li> <li>• Provide appropriate resources to ensure adequate biosafety program management</li> <li>• Assess risk of occupational exposure and infection associated with handling biohazardous agents/materials</li> <li>• Assess effectiveness of existing exposure controls and advises on different control methodologies</li> <li>• Develop and deliver training on exposure control strategies</li> <li>• Support investigations of biohazard-related injuries and illnesses</li> <li>• Provide technical support to health surveillance program managers</li> <li>• Manage technical aspects of 3<sup>rd</sup> party providers, (e.g. laboratories, consultants)</li> <li>• Provide input to biohazard emergency response plans and pandemic planning &amp; preparedness</li> <li>• Critically analyze occupational exposure data at site and advise senior management</li> <li>• Provide advice on choice of appropriate inactivation methods for biohazardous agents and materials and the potential hazards (explosive, flammable, corrosive, carcinogenic, and irritating) associated with various disinfectants and sterilants</li> </ul>	
<b>Knowledge</b>		
<p><b><u>Requirements:</u></b></p> <ul style="list-style-type: none"> <li>• A Bachelor’s degree in biological sciences</li> <li>• Successful completion of several microbiology related courses (e.g., General Micro., Virology)</li> </ul> <p><b><u>Acquires a firm understanding of the following:</u></b></p> <ul style="list-style-type: none"> <li>• The role and function of an institutional biosafety committee (IBC)</li> <li>• Regulatory guidelines and standards in his/her country impacting work with, and proper packaging and shipping requirements for, biohazardous agents and materials</li> <li>• Interpretation of health data in Safety Data Sheets (SDSs), including biohazard classification</li> <li>• The health effects of biohazardous agents</li> <li>• The routes of exposure, modes of transmission, and other criteria that determine the hazard category of a biohazardous agent</li> </ul>	<p><b><u>Requirements:</u></b></p> <ul style="list-style-type: none"> <li>• A Bachelor’s degree in biological sciences; an advanced degree is desirable</li> <li>• Successful completion of several microbiology related courses (e.g., Gen. Micro., Epidem., Patho.Micro., Molec. Biol., etc.)</li> </ul> <p><b><u>In addition to the knowledge of a Developing BSO, a Competent BSO must:</u></b></p> <ul style="list-style-type: none"> <li>• Have a comprehensive knowledge of regulatory guidelines and standards in his/her country impacting work with infectious agents and materials</li> <li>• Demonstrate the ability to design and apply engineering solutions and address any deficiencies (e.g. general ventilation, isolators, facility design)</li> <li>• Demonstrate the ability to recognize the characteristics of biohazardous agents and materials</li> <li>• Demonstrate familiarity with routes of exposure, modes of transmission, and other criteria that determine the hazard category of a biohazardous agent</li> <li>• Understand factors that may affect susceptibility, resistance, or consequences of infection</li> </ul>	

DEVELOPING BSO	BSO CORE COMPETENCIES
<p><b><u>Acquires a firm understanding of the following (continued):</u></b></p> <ul style="list-style-type: none"> <li>• The design principles for engineering controls and the basic operation of biosafety cabinets and other engineering devices and equipment</li> <li>• The selection, use and maintenance of PPE, including Respiratory Protection Equipment (RPE), gloves and appropriate outer protective-wear</li> <li>• The common failure modes for exposure controls, including PPE</li> <li>• The principles on maintenance and testing of containment and ventilation systems</li> <li>• The basic requirements for proper biological laboratory design and operation</li> <li>• How to conduct a risk assessment, assign biosafety containment levels (e.g. BSL, ABSL), and implement recommended work practices, engineering controls and facility design requirements to mitigate risk associated with work involving biohazardous agents and materials</li> </ul>	<p><b><u>In addition to the knowledge of a Developing BSO, a Competent BSO must (continued):</u></b></p> <ul style="list-style-type: none"> <li>• Demonstrate knowledge of use, applicability, and potential hazards (explosive, flammable, corrosive, carcinogenic, and irritating) associated with various disinfectants and sterilants</li> <li>• Understand how to use chemicals, steam, dry heat, irradiation, filtration, ultraviolet (UV) sources, gases, or other agents to kill or inactivate biohazardous agents/materials and validation of procedures</li> <li>• Understand the exposure risks associated with biohazardous aerosols in the workplace, such as aerosol generation, ventilation, indoor air quality, recirculation, and cooling towers</li> <li>• Understand the hazards of exposure of service, cleaning, or other support personnel to biohazardous agents and materials</li> <li>• Have a comprehensive understanding of requirements for proper biological laboratory design and operation</li> </ul>

<b>Experience</b>	
<ul style="list-style-type: none"> <li>• Maintained biohazard inventories and/or registers</li> <li>• Gathered and organized data on biohazards and biohazardous processes</li> <li>• Conducted and documented regular site inspections to ensure compliance with site Biosafety Policies and Procedures</li> <li>• Participated in biorisk and biosecurity risk assessments and managed SDS's</li> <li>• Participated in at least one investigation of an adverse health effect</li> <li>• Participate in developing and presenting training programs under guidance of the BSO.</li> </ul>	<ul style="list-style-type: none"> <li>• Managed a comprehensive biosafety program for a minimum of 5 years</li> <li>• Developed and delivered training on biohazardous agents and materials</li> <li>• Developed, conducted and documented regular site inspections to ensure compliance with site biosafety policies and procedures</li> <li>• Developed and implemented a comprehensive biohazardous agent risk assessment process</li> <li>• Developed a comprehensive audit system to measure effectiveness of site programs</li> <li>• Implemented exposure reduction solutions and supported investigations of different adverse health effects</li> </ul>

**Note:** A *Developing* Biological Safety Officer has the basic skills and knowledge to coordinate and implement a site's Biosafety Program, but may lack some of the necessary skills and practical knowledge to independently manage a comprehensive Biosafety Program. The skills and knowledge required for this take at least 5 years to develop before they attain the level of *Competent* Biosafety Officer.