



Design and Implementation of Basic Biosafety Cabinet Field Certifier Accreditation Training for Central Asian Biosafety Professionals



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Protective control measures that are poorly implemented or maintained are a recognised source of lab-acquired infections. Out of date and non-serviced laboratory equipment can put laboratory users at risk of infection. Faulty microbiological biosafety cabinets are of concern as they may expose laboratory users to aerosolised pathogens. Here we describe the implementation of the first Basic Biosafety Cabinet Field Certifier Accreditation Course in Europe. Public Health England is the first and only NSF International pre-approved site in Europe to deliver this training.

INTRODUCTION

EU CBRN Centres of Excellence Project 53 entitled “Strengthening the National legal framework and provision of specialized training on Biosafety and Biosecurity in Central Asian countries” involved five international organisations and seven partner countries.



Project 53 had three core objectives:

1. Awareness raising

to raise awareness of the importance on biosafety and biosecurity issues with national stakeholders in the partner countries, and to promote national and regional cooperation on these issues.

2. Specialist Training (on which this poster focuses)

to support adjusting local biosafety and biosecurity training to international standards, while stimulating regional cooperation on relevant issues.

3. Legal Framework

to assist partner countries to realize their international obligations to harmonize national biosafety and biosecurity legal frameworks with the World Health Organisation’s International Health Regulation (WHO IHR), Biological Weapons Convention (BWC), and Codex Alimentarius food safety laws.

SPECIALIST TRAINING

Training activities were divided into two workflows:

1. Biosafety & Biosecurity Train the Trainer training.

Seven week-long in-country training courses, with 3 days focusing on Biosafety & Biosecurity content and 2 days of Train the Trainer activities. In total 88 trainees became trainers in Biosafety & Biosecurity through this workflow.



2. Specialist Training

Through a training needs assessment tool, specific areas of training needs were identified by partner countries. Training was provided in each of these areas by subject matter experts and included the following:

- Molecular detection by qPCR of especially dangerous pathogens (EDPs)
- Principles, Practices and Interpretation of molecular diagnosis of EDPs
- Sample processing of EDPs using a Flexible Film Isolators (FFI)
- Whole Genome Sequencing of EDPs using the minION (Oxford Nanopore)
- **Basic Biosafety Cabinet Field Certifier Accreditation (NSF) (on which this poster focuses)**

BASIC BIOSAFETY CABINET FIELD CERTIFIER ACCREDITATION

In response to a demonstrated need for improved field certification infrastructure worldwide, the US Biosafety Standards organisation; NSF International initiated the basic biosafety cabinet field certifier accreditation program in 2017 for field certifiers who live and work outside of North America.

It is tailored to the international marketplace and is intended not only to provide trained field certifiers with credentials, but to promote overall awareness of the need for routine biosafety cabinet maintenance.

The goal of the program is to encourage and assist with the development of a BSC maintenance infrastructure in under-resourced countries to address public health and safety concerns.



<http://www.nsf.org/services/by-industry/pharma-biotech/biosafety-cabinetry/biosafety-cabinet-field-certifier-accreditation>

Public Health England’s **Novel and Dangerous Pathogens (NADP) Training** team, with support from the PHE Biosafety team, delivered an innovative two week Biosafety Cabinet Field Certifier course to meet US and EU Standards. Trainees were then independently assessed and accredited (on passing both written and practical tests) by an NSF International Proctor.

Trainees were taught to be able to carry out Biosafety Cabinet tests relevant to both US (NSF/ANSI 49 (2018)) and a European Standard (EN12469).

Basic Accreditation Program: Biosafety Cabinet Field Tests	
Downflow velocity (both NSF/ANSI 49 & EN 12469 methods)	
Inflow velocity (secondary, constricted access)	
Inflow velocity (secondary, exhaust velocity)	
HEPA Filter leak – Scan	
Site installation assessment	
Smoke patterns (screen, working edge, sash seal retention tests)	



Clockwise from top left, exhaust velocity test, smoke pattern test, downflow velocity test (NSF/ANSI49) preparation, downflow velocity test (EN 12469) and HEPA leak scanning.

RESULTS



In this first course, 6 Mongolian and 2 Kazakh laboratory scientists and engineers completed one week of intensive hands-on training. This was followed by one week of external and independent assessments (1 written and 5 practical assessments) by an NSF Proctor. The trainings were based to meet the criteria of biosafety cabinet field tests below, as outlined in the NSF/ANSI 49 and EN12469 standards.

A minimum score of 80 percent was required to pass the written examinations. A minimum score of 90 percent was required to pass primary tests (practical assessments).

5 Mongolian Specialists passed the practical assessment, of which 4 also passed the written exam. 2 Kazakh specialists passed both the practical and written exams.

This resulted in a total of 6/8 specialist (75%) being accredited as Biosafety Cabinet Field Certifiers by NSF International. These individuals can be found on the NSF International online database (below) with their professional contact details. This will allow for laboratories in their respective or neighbouring countries to request certified field testing of their biosafety cabinets. This was the highest course pass rate observed by NSF International to date.

Search for NSF Accredited Biosafety Cabinet Field Certifiers - Basic Accreditation Program		
NOTE: The Basic Accreditation Program is not available to field certifiers who live and/or certify biosafety cabinets in North America.		
Certifier Name	Ulaanbaatar Orgilbayar Ukhbayar Naranbaatar Narangerel Davakhshuu Gantulga Andrey Zhigalov Zhanna Berdyulov	8 trainees (6 Mongolia / 2 Kazakhstan): 4 Engineers 4 Molecular/Microbiologists
Certifier Physical Location Search	6 Mongolia Kazakhstan	Written Examination: 6/8 passed (75%) A minimum score of 80 percent is required to pass written examination
Certifier Service Location Search	2 Ulaanbaatar Almaty	Practical Examination: 7/8 passed (87.5%) A minimum score of 90 percent is required to pass primary tests

Mongolia and Kazakhstan are the first countries in Central Asia to have certifiers providing these essential BSC field maintenance services.

DISCUSSION

This newly available and well-timed training course will allow laboratories to send engineers and laboratory staff to become accredited biosafety cabinet field maintenance certifiers. On successfully passing the written and practical examinations, they will become certified by the Internationally recognised accreditation body, NSF International for a period of 5 years (reviewed by NSF annually).

These newly NSF-accredited certifiers can ensure that laboratory users in their respective countries are working with equipment tested to the level expected by International standards.

Public Health England (PHE)’s Novel and Dangerous Pathogens Training Laboratory in Porton Down, UK is an NSF International pre-approved test site for the basic accreditation program practical and theoretical examinations. PHE is the only approved test site in Europe with biosafety cabinet field certifier accreditation training available for candidates from countries outside North America. For further information on this training course please contact: nadp.training@phe.gov.uk or visit our website to see our range of other biosafety related courses: <https://www.phe-protectionservices.org.uk/nadp/courses/list>



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