Idaho State Police
Forensic Services

Breath Alcohol Training Plan

New Analyst Training

Breath Alcohol and Instrument Calibration – Revision 0

Analyst in Training: _____
Forensic Scientist ____

Trainer: _____
Forensic Scientist ____

Trainer: _____
Forensic Scientist ____

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Breath Alcohol Training Plan -Rev 0
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1.0 TABLE OF CONTENTS

1.1 TRAINING OBJECTIVES

1.1.1 Introduction

This section is intended to serve as a guide for an Idaho State Police Forensic Services (ISP-FS) analyst training to perform breath alcohol instrument calibration as well as testify as an expert in breath alcohol testing. The calibration of instruments is described in Breath Alcohol Analytical Methods *2.0, 4.0, and 5.0.*

Those training in Breath Alcohol Analysis must attain knowledge of the instrumentation used within Idaho for the collection of evidentiary breath samples, the SOP for acquiring the breath samples in the field, as well as the analytical methods associated with the laboratory calibration of the breath testing instruments.

1.1.2 Approach to Training

1.1.2.1 In order to address the training plan questions, the suggested reading cited should be consulted if the Analyst in Training is not familiar with the subject matter.

1.1.2.2 Answers to training plan questions may be provided verbally and/or in written form. This choice is at the discretion of the trainer. Both the education and work experience of the Analyst in Training will be considered; however, a verbal or written competency verification of material should be done to the satisfaction of the Trainer.

1.1.3 Training Order

Although all training does not have to proceed in the order used in this training plan, certain topics should be completed prior to others.

1.1.3.2 The trainee may be signed off to do instrumental calibrations as a Technical Calibrator, while not signed off to testify in breath alcohol cases in general.

1.1.3.3 The trainee may be signed off on certain instruments in use in Idaho and not others that are being phased out. This precludes the trainee from calibrating those instruments.

1.1.4 Additional Training for Experienced/Signed-off Analyst

1.1.4.1 For training of an experienced analyst (Forensic Scientist II or III) in a new or updated technique or instrument, the training is to be commensurate with the magnitude of changes with consideration of the analyst's existing background. The extent of training will be agreed upon by the discipline leader and quality manager with input from the analyst.

1.1.4.2 If a separate training plan section has been created for the training topic and/or analytical method then it must be utilized, otherwise the appropriate portions of this training plan section must be used.

1.1.5 Continual Awareness of Relevant Literature

The new or experienced analyst is reminded that this training plan only addresses the core of training for breath alcohol and instrument calibration. After the completion of training, the analyst is responsible for keeping their knowledge current through continual literature review. This must include relevant journals, newsletters and text books.

1.2 EVIDENCE HANDLING ISSUES

1.2.1 Describe the procedures followed for the intake and transfer of instruments specifically submitted for calibration.

1.2.2 Describe the precautions taken for the storage and transport of compressed gas cylinders.

1.2.3 Describe the IDAPA 11.03.01 requirements for breath alcohol testing and calibration.

1.2.4 Suggested Reading

1. IDAPA 11, Title 03, Chapter 01: Idaho State Forensic Laboratory Rules Governing Alcohol Testing.

1.3 SOLUTION PREPARATION

1.3.1 Demonstrate an ability to prepare, and record the preparation of, solutions required in the analysis and calibration of breath alcohol instruments.

1.3.2 Suggested Reading (relevant pages from other editions of the following references may be substituted)

1. College Chemistry Text, chapter(s) discussing the properties of solutions.

2. Shugar, G.J., Shugar, R.A. and Bauman, L. *Grades of Purity of Chemicals* pp. 145-154, *pH Measurement*. pp. 232-234. *in:* Chemical Technicians' Ready Reference Handbook, McGraw Hill: New York, 1973.

3. Seamonds, B. and Byrne, E.A. *Basic Laboratory Principles and Techniques.* pp. 3 - 43. *in:* Clinical Chemistry: Theory, Analysis, Correlation. Mosby, 2003.

1.4 FC20 INSTRUMENT CALBRATION

1.4.1 Analyst in Training must possess a working knowledge of the theory and inner workings of the Lifeloc FC20.

1.4.2 The trainee should be familiar with BRALC AM 2.0.

1.4.3 The Analyst in Training must demonstrate their ability to calibrate the Lifeloc FC20 series of instruments.

1.4.5 The Analyst in Training must demonstrate their ability to utilize the EASYCAL® dry gas system for calibration of Lifeloc FC20 series of instruments.

1.4.6 The Analyst in Training must demonstrate their ability to perform software updates and modifications to the FC20 software and programming parameters utilizing vendor provided software and tools.

1.4.7 Suggested Reading (relevant pages from other editions of the following references may be substituted)

1. Lifeloc FC20 reference manual
2. EASYCAL® users guide and reference manual.

1.5 ASIII INSTRUMENT CALBRATION

1.5.1 Analyst in Training must possess a working knowledge of the theory and inner workings of the Intoximeter ASIII.

1.5.2 The trainee should be familiar with BRALC AM 2.0.

1.5.3 The Analyst in Training must demonstrate their ability to calibrate the Intoximeter ASIII series of instruments.

1.5.4 Suggested Reading (relevant pages from other editions of the following references may be substituted)

1. Intoximeter ASIII reference manual

1.6 INTOXILYZER 5000 SERIES INSTRUMENT CALBRATION

1.6.1 Analyst in Training must possess a working knowledge of the theory and inner workings of the Intox 5000 series.

1.6.2 The trainee should be familiar with BRALC AM 4.0.

1.6.3 The Analyst in Training must demonstrate their ability to calibrate the Intox 5000 series of instruments.

1.6.4 Suggested Reading (relevant pages from other editions of the following references may be substituted)

1. Intox 5000 reference manuals

1.7 DRAEGER 9510 INSTRUMENT CALBRATION

1.7.1 Analyst in Training must possess a working knowledge of the theory and inner workings of the Draeger 9510.

1.7.2 The trainee should be familiar with BRALC AM 5.0.

1.7.3 The Analyst in Training must demonstrate their ability to calibrate the Draeger 9510 series of instruments.

1.7.4 Suggested Reading (relevant pages from other editions of the following references may be substituted)

1. Draeger 9510 reference manual
2. Draeger 9510 Users guide.

1.8 BREATH ALCOHOL ANALYSIS STANDARD OPERATING PROCEDURE

1.8.1 The Analyst in Training must convey their understanding of the analysis protocol in SOP 6.0.

1.8.2 Analyst in Training must describe how operators and specialist obtain and maintain certification.

1.8.3 Analyst in Training must detail their approach in determining if a testing protocol is compliant with IDAPA 11.03.01.

1.8.4 Analyst in Training must describe the proper storage and transportation of instruments and standards.

1.8.5 Analyst in Training must describe the acceptance criteria for a performance verification and calibration.

1.8.6 Analyst in Training must describe how quality assurance data is monitored and where it must be stored.

1.8.7 Analyst in Training must describe how breath alcohol concentrations must be reported.

1.8.8 The Analyst in Training must discuss the different types of alcoholic beverages and their respective alcohol content.

1.8.9 The Analyst in Training must describe the intermediate check procedure for the instruments.

1.8.10 Suggested Reading

1. BRALC SOP 6.0.
2. Idaho Administration Code, IDAPA 11.03.01, Rules Governing Alcohol Testing.

1.9 CASE RECORD PREPARATION

1.9.1 The Analyst in Training must describe which documents, data and completed information is required to be included in an instrument calibration case record.

1.9.2 The Analyst in Training must describe the QA/QC data that is necessary to be centrally stored for instrument calibrations.

1.9.3 The Analyst in Training must describe requirements for administrative and technical review of case file and calibration certificates.

1.10 BREATH ALCOHOL TESTIMONY

1.10.1 The Analyst in Training must demonstrate a working knowledge of the pharmacology of alcohol and other commonly encountered volatiles. This must include an understanding of the factors affecting absorption, distribution and elimination.

1.10.2 The Analyst in Training must describe the situation when the alcohol content of arterial blood exceeds that of venous blood.

1.10.3 The Analyst in Training must be familiar with the metabolism of ethanol and other commonly encountered volatiles. This must include how metabolism relates to toxicity.

1.10.4 The Analyst in Training must describe their understanding of the effects of alcohol and other commonly encountered volatiles on the human body. This must include how it contributes to mortality and impairment observed in DUI cases.

1.10.5 The Analyst in Training must describe the analytical capabilities and technologies employed by each testing instrument in use in Idaho.

1.10.6 The Analyst in Training must be comfortable with the development, performance and interpretation of Standardized Field Sobriety Tests (SFST) and a Drug Recognition Exam (DRE).

1.10.7 The Analyst in Training must describe the potential sources of uncertainty associated with a performance verification.

1.10.8 The Analyst in Training must describe the potential sources of mouth alcohol contamination. This section is to include sources associated with external as well as internal sources. Relevant reading and research is ongoing and continual.

1.10.9 The Analyst in Training must describe the potential sources of external interference.

1.10.10 The Analyst in Training must be well versed and competent in explaining the nuances of scientific defense challenges to a breath alcohol case.

1.10.10.1: Topics include, but are not limited to: Blood:Breath Ratios, Hlastala's paradigm, RFI, Rising BAC, Alveolar air v. Deep lung breath, Hypo- or Hyperthermia, Breathing patterns, Belching-Burping, GERD, Dentures and other dental work, Slope detectors, Specificity and interfering substances, Widmark calculations, Uncertainty of Measurement, and traceability.

1.10.11 Suggested Reading (relevant pages from other editions of the following references may be substituted)

1. Levine, B., *Alcohol*. *in:* Principles of Forensic Toxicology, Second Edition, edited by Barry Levine, pp. 175 - 190, AACC Press, 2003.

2. Kunsman, G.W., *Human Performance Testing.* pp. 15 - 30, *in:* Principles of Forensic Toxicology, Second Edition, edited by Barry Levine, AACC, 2003.

3. Caplan, Y.H., *The Determination of Alcohol in Blood and Breath.* pp. 594-648, *in:* Forensic Science Handbook, Volume I, edited by Richard Saferstein, New Jersey: Prentice-Hall, 1981.

4. Julien, R.M., *Central Nervous System Depressants: Alcohol and the Inhalants of Abuse*. pp. 64-92, *in:* Primer of Drug Action, New York: Freeman, 1998.

5. Perrine, D.M., *Depressants: Alcohol, Benzodiazepines, Barbiturates*, pp. 113-129, *in:* The Chemistry of Mind-Altering Drugs, ACS, Washington, DC, 1996.

6. Fleming, M.F., Mihic, S.J. and Harris, R.A., *Drugs Acting on the Central Nervous System - Ethanol. in:* Goodman and Gilman's The Pharmacological Basis of Therapeutics, 11th edition, 591 - 606, McGraw-Hill, 2006.

7. Garriott, J.C. and Manno, J.E., *Pharmacology and Toxicology of Ethyl Alcohol.* pp. 26-45, *in:* Medicolegal Aspects of Alcohol, Fifth edition, edited by James C. Garriott, Lawyers & Judges, 2008.

8. Jones, A.W., *Biochemical and Physiological Research on the Disposition and Fate of Ethanol in the Body*. pp. 47-156, *in:* Medicolegal Aspects of Alcohol, edited by James C. Garriott, Fifth edition, Lawyers & Judges, 2008.

9. Jones, A.W., *Biomarkers of Acute and Chronic Alcohol Ingestion.* pp. 157 - 204, *in:* Medicolegal Aspects of Alcohol, Fifth edition, edited by James C. Garriott, Lawyers & Judges, 2008.

10. Garriott, J.C., *Analysis for Alcohol in Postmortem Specimens.* pp. 217- 228, *in:* Medicolegal Aspects of Alcohol, edited by James C. Garriott, Fifth edition, Lawyers & Judges, 2008.

11. Anderson, W.H., *Collection and Storage of Specimens for Alcohol Analysis.* pp. 275 - 283, *in:* Medicolegal Aspects of Alcohol, Fifth edition, edited by James C. Garriott, Lawyers & Judges, 2008.

1.11 PERFORMANCE OF CALIBRATION ON PRACTICE INSTRUMENTS AND COMPETENCY TESTING

To develop their expertise in using analytical methods, the Trainee will apply them to the analysis of control instruments. Instruments submitted to the lab for calibration may be used for this purpose, as long as the trainer is observing the trainee perform the duties of the calibration of the instrument (hand of the analyst). The Analyst in Training will be responsible for the analysis of no less than 5 instruments under close supervision. This will be accomplished for each instrument section the trainee is to be signed off on. When both parties are comfortable with the trainee's proficiency and understanding of the methods, this section can be signed off.

1.12 INSTRUMENT CALIBRATION SPECIFIC COMPLETION

Specific instrument sections can be signed off prior to completing the entirety of the training. Each instrument section must have competency testing completed as well as sections 1.2, 1.3, 1.9 and 1.15 prior to beginning any instrument calibration.

1.13 IDAHO STATE POLICE FORENSIC CORE TRAINING

The analyst must have completed the core training module prior to mock court testimony. (When an analyst that was hired prior to the core training module being implemented the discipline leader will evaluate if that analyst needs to complete any sections of the core training and will sign off on this section based on past training and experience within our lab system. Any analysts hired after the implementation of the core training module must complete the entire module regardless of past training and experience.)

1.14 MOCK COURTROOM TESTIMONY

A mock court trial must be conducted for the Analyst in Training to provide testimony for a minimum of the following situations. If a trainee is being I signed off on only a portion of the training plan, they must complete a mock trial on that portions material prior to undertaking the duties accompanying with the section.

1. DUI Breath alcohol analysis with pharmacology questions.

Analysts performing only instrument calibrations, need only cover the calibration activities in a mock court setting. Care must be taken to not "over testify" if the trainee is only performing laboratory calibrations.

1.15 COMPREHENSIVE COURSE ONALCOHOL TESTING

Within one-year of starting training in volatiles analysis, or prior to starting training, the trainee must attend and successfully complete a nationally recognized course on alcohol testing and related medico-legal matters.

1.2 EVIDENCE HANDLING ISSUES

Competency Verified by: ❒Written Examination ❒Verbal Examination

_____ _____
Date of Completion Analyst in Training

_____
Trainer

1.3 SOLUTION PREPARATION

Competency Verified by: ❒Written Examination ❒Verbal Examination

_____ _____
Date of Completion Analyst in Training

_____
Trainer

1.4 FC20 INSTRUMENT CALIBRATION

Competency Verified by: ❒Written Examination ❒Verbal Examination

_____ _____
Date of Completion Analyst in Training

_____
Trainer

1.5 ASIII INSTRUMENT CALBRATION

Competency Verified by: ❒Written Examination ❒Verbal Examination

_____ _____
Date of Completion Analyst in Training

_____
Trainer

1.6 INTOXILYZER 5000 INSTRUMENT CALBRATION

Competency Verified by: ❒Written Examination ❒Verbal Examination

_____ _____
Date of Completion Analyst in Training

_____
Trainer

1.7 DRAEGER 9510 INSTRUMENT CALBRATION

Competency Verified by: ❒Written Examination ❒Verbal Examination

_____ _____
Date of Completion Analyst in Training

_____
Trainer

1.8 BREATH ALCOHOL ANALYSIS STANDARD OPERATING PROCEDURE

Competency Verified by: ❒Written Examination ❒Verbal Examination

_____ _____
Date of Completion Analyst in Training

_____
Trainer

1.9 CASERECORD PREPARATION

Competency Verified by: ❒Written Examination ❒Verbal Examination

_____ _____
Date of Completion Analyst in Training

_____
Trainer

1.10 BREATH ALCOHOL TESTIMONY

Competency Verified by: ❒Written Examination ❒Verbal Examination

_____ _____
Date of Completion Analyst in Training

_____
Trainer

1.11 PERFORMANCE OF CALIBRATION ON PRACTICE INSTRUMENTS AND COMPETENCY TESTING

Competency Verified by: ❒Examination of data and

❒Direct observation

_____ _____

Date of Completion Analyst in Training

_____

Trainer

1.13 ISP CORE TRAINING COMPLETED

Competency Verified by: review of completed checklist or confirmation for Quality Manager.

_____

Trainer

1.14 MOCK COURTROOM TESTIMONY

Competency Verified by: Successful Completion

_____ _____

Date of Completion Analyst in Training

_____

Trainer

1.15 COMPREHENSIVE COURSE ON ALCOHOL TESTING

Competency Verified by: Successful Completion, Refer to Training Certificate.

_____ _____

Date of Completion Analyst in Training

_____

Trainer

APPENDIX A

Guide for evaluating completion of practice casework

It is expected that analysts will progress at different rates based on past experience; education and that people learn and retain skills differently. The following are general guidelines for the trainer to consider when assigning, evaluating and signing off on the practice casework section of the toxicology training manual.

We anticipate the trainees will practice each analysis method with laboratory instruments, when feasible.

The trainee will generally practice with instruments to learn the analysis process and then the trainee will do practice runs that consist of instruments submitted to the laboratory for calibration.

The trainer should observe the trainee calibrating multiple instruments. During this observation the trainer will confirm that the trainee is:

- Handling the instruments with care and in a way that ensures the instrument long term stability.
- Using appropriate techniques to prevent instrumental drift.

The trainee will demonstrate that they store and handle controls and standards appropriately.

The trainee will be able to perform the routine maintenance, and perform and evaluate the quality checks that are required for all of the instrumentation he or she is approved to use.

The trainee will demonstrate that he or she is comfortable operating the instrumentation and can do basic trouble shooting.

The trainee will demonstrate the understanding of when the officer or prosecutor should be consulted on casework decisions.

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0	04-22-2015	Original Issue