Workshop Abstracts - 2025

Life Support

10 Hour OSHA General Industry Course - Stiles Inc. (Dry)
Designed by OSHA to provide awareness training on topics such as: Introduction to OSHA, Walking and Working Surfaces, Electrical, Hazard Communication, Personal Protective Equipment. Exit Routes, Emergency Action Plans, Fire Prevention, Material Handling, Hazardous Material (Flammables and Combustibles), and Permit Required Confined Space Entry. People completing both days of training will be mailed an OSHA 10 General Industry Card distributed by the Department of Labor.

Acrylic Scratch Removal American Sealants (Dry)
Workshop attendees will be instructed on proper techniques for performing preventative maintenance tasks on acrylic surfaces, assessing and properly identifying damage to acrylic surfaces such as crazing, minor scratch identification and major scratch identification. Workshop attendees will be taught the techniques of minor scratch removal and have the opportunity to remove minor scratches from an acrylic tank.

Level II Actuated Butterfly and Ball Valve Workshop – Georg Fischer (Dry)
Hands on assembly, disassembly, and troubleshooting of electrically actuated butterfly valves and ball valves. Workshop will consist of parts identification, installation and setting of electric actuators, and complete disassembly and reassembly. Additionally, wiring of the actuators, diagnosing failure conditions, and overviewing actuator features will be covered.

Advanced Drum Filter Design Considerations & Maintenance - Integrated Aqua Systems, Inc. (Wet)
Integrated Aqua Systems, Inc. is offering a class with instruction on design considerations, proper selection, application and maintenance of gear wheel driven drum filters using a HEX filter installed and operational on the BAWL as a working example. In addition to a brief overview of basic drum filter operation and maintenance, attendees will receive an overview of different drum filter types, control systems, options and design applications. Practical sections will include basic controller setup and programming required to operate and maintain drum filters to their design specifications.

Advanced Lighting for Corals and Aquatic Exhibits - Reef Brite (Dry)
The workshop will instruct participants in evaluating and assessing lighting for corals, and other exhibits. There's a new section this year that addresses working with wild coral and preparing them to be returned to the wild. Participants will receive detailed instruction on measuring and evaluating ppfd (PAR), PUR, DLI, Kelvin, Lumen, Lux, CRI and much more. The workshop will offer participants the opportunity to use a Spectrometer, Quantum Flux Meter, and other light measurement equipment, to test and evaluate light sources used for exhibit and facility use.

Advanced Oxidation Training - International O_3 (Wet)

- The water loop system will include a circulation pump, water flow meter, ozone generator, contact chamber, UV sterilizer, and two ORP points.
- The purpose is to demonstrate the reaction when UV is used after ozone in LSS systems.
- Discuss positive and negative reactions that occur and how these can affect fish systems.
- Review data curves from a facility using this set up.

ASME B31.3 Solvent Cementing Training for PVC & CPVC – IPS Workshop (Dry)

This workshop will cover the basics of solvent welding PVC pipe, causes of failed joints and cement & primer selection. There are two parts to this class. There will be a PowerPoint Presentation in a classroom and a hands-on class where each student will make a sample under our supervision. The sample will then be tested at our facility. If the sample passes the hydrostatic testing, the student will be issued an ASME B31.3 Bonder qualification card stating that they have successfully completed the training.

Automated Control Systems Workshop – RCK Controls (Wet)

This workshop will run throughout the day as an informal discussion/observation and will not be a slot in which an attendee can register for. This is an opportunity for attendees to interact with the controls end of the BAWL as you finish a workshop or are between activities. The automation supports many of the actual workshops so there is usually something going on. Folks from RCK and ABB will be on hand to provide an overview of how VFDs and Automated Controls Systems (ACS) can help save time, energy consumption, reduce mechanical stress and provide alarm notifications when the LSS is not functioning within parameters. The B.A.W.L will be automated by a control system and attendees can witness live feedback from various points throughout the system including flow, pressure and level. The loop pumps run on VFDs, the folks from ABB will be on hand to discuss soft starting pumps, control loops managed direct by intelligent VFDs as well as VFD maintenance items. **Please Note: This is an Informal Workshop and is not specifically scheduled, but is open and always available to visit at the B.A.W.L. control booth**

BAWL Commissioning & Startup (Wet)

This unique workshop is designed for newcomers to the LSS industry. The attendees will get hands-on experience with all the exciting facets of the initial setup, startup, and commissioning of the Big Automated Water Loop. This workshop will provide a comprehensive system startup experience including, but not limited to: Flange assembly, solvent cement welding techniques, pipe fusion practices, protein skimmer assembly and tuning, introduction to automation, problem solving and troubleshooting. During the BAWL build-out this workshop will cover a variety of topics including:

- Flange Assembly
- Cement Welding
- Fusion Welding
- Commissioning
- System Start-up
- Pump and Motor Rebuild
- Water Quality
- System Controls
- Automation

Basic Drum Filter Maintenance - Integrated Aqua Systems, Inc. (Wet)

Integrated Aqua Systems, Inc. is offering a hands-on workshop on the operation and maintenance of gear wheel driven drum filters using a HEX drum filter installed and operational on the BAWL. Attendees will receive basic instruction on the theory of operation, key parts identification, backwash sequence and proper start-up of a drum filter. Practical sections will include basic maintenance tasks required to operate and maintain drum filters to their design specifications including panel maintenance, lubrication, basic controls set up, troubleshooting.

Basic LSS-Skid Style - Hayward (Wet)

Demonstration and discussion with a life support skid to illustrate the variety of life support system components, as well as automating systems, basket strainers, bag filters, pumps and more. The skid-based system will contain a variety of products including valves, filtration, strainers, actuation, and control products for an operational education experience

Basic Monitoring Systems & Troubleshooting - RCK Controls Inc. (Dry)

This workshop will cover basic monitoring and automation systems concepts and components to prepare facilities to adhere to requirements set by the Association of Zoos & Aquariums (AZA). Participants will gain insights into both the technical and practical aspects of deploying and operating these systems. Come learn how to add a simple monitoring and control system to ensure optimal animal welfare.

Bio-Filtration Workshop- Longhorn Organics (Wet)

This is a 2 part workshop in each session. The first half will focus on the basics, the second half will be geared towards more advanced Q&A

Workshop Purpose:

To provide hands-on learning of various types of bio-filtration systems commonly used in the aquatics industry. Demonstrate functionality, maintenance, and testing procedures best practices.

Attendee Take Away:

- How to build their own small bio-filtration systems.
- How to qualify systems prior to purchase.
- What types of media are available to meet goal/target.
- How to maintain, clean, disassemble/reassemble at least 2 types of bio-filtration.
- How to create and maintain accurate and thorough records of functionality of bio-filters.
- How to perform and interpret water testing results to achieve desired outcomes of bio-filter use.
- How to cycle a new system – seeding, cycling, testing.
- How to manage the nitrogen cycle to your advantage.
- Q&A with workshop presenters for real world scenarios.

Advanced Q&A

- To provide deeper understanding of biological effects of bio-filter metabolites (detritus, organic acids, ect.).
- Discussions of scaling, biofilms, oxidation bi-products and water chemistries of established bio-filters.
- Attendee Take Away:
- How to perform preventative maintenance based off water chemistry data.
- How to correlate animal behavior and water chemistry of your bio filter.
- Deeper understanding of water chemistry.
- Comparative discussion of the chemistry of aerobic and anaerobic water chemistries.
- Q&A with workshop presenters.

Blueprint Reading - Satchell Engineering & Associates (Dry)

Understanding blueprint reading is a fundamental skill for designers, contractors, engineers, operators, and building owners. In this interactive lecture and hands-on class, you'll gain a solid understanding of blueprint terminology and conventions. Key topics include drawing scales, P&IDs, plan, elevation, and section views, as well as architectural symbols and legends. This course is designed to help you understand how blueprint sets are organized and to confidently interpret their details.

Butterfly valve repair/disassembly/reassembly - Hayward (Dry)

The workshops will focus on basic butterfly valve installation and will include hands-on training to remove and/or replace the valve liner, shaft seals, shaft and disc, and the re-assembly of the same. The program will also discuss different valve/liner materials and when (or not) to use them.

CAIRE (AirSep) Topaz Service & Troubleshooting Workshop (Dry)

Participants in this class will be given a brief presentation on how an AirSep concentrator works and review all of its components. Then we will have 4 Topaz oxygen units running and participants will do system checks on each one, go over troubleshooting, and do a complete routine PM service, including an air compressor rebuild.

After this class you will be able to perform a complete PM on your Topaz oxygen unit. And you will be able to confirm if your current maintenance program for your Topaz series is complete so you maintain a good reliable system!

CPO Certification Blended Training* – Joel Yankie

The CPO® certification program includes pool and spa chemistry, testing, treatment, filtration, maintenance, automatic feeding equipment, and government requirements. Participants will achieve a better understanding of the operator's role in pool care, management, and risk reduction. Many state and local health departments accept the CPO® certification program. This two-part course begins with prior completion (before the AALSO Symposium) of an online curriculum that follows the 18 chapters in the NSPF® Pool & Spa Operator™ Handbook, which is also provided. Students must bring a Pool Operator Primer™ Record of Completion to the classroom on Thursday and successfully complete the Pool Operator Fusion™ class to obtain a CPO® Certification. The CPO® certification program requires an in class open book written examination. Upon successful completion of this course and exam, participants will receive CPO® certification from NSPF in the mail and is valid for five years.

Dry Actuation Workshop, Basics 101 - Hayward (Dry)

A short overview about electric actuators and their applications followed by the breakdown/opening of the actuators, identification of the critical parts and features, cam adjustments, and the powering up of the actuators and their basic operation.

Exhibit Lighting Design + DMX Lighting Programming Workshop - Kessil (Dry)

This workshop will focus on two main topics, exhibit lighting design and a hands on review of DMX Programming. Designing lighting for an exhibit must meet many different standards and signoffs from various groups. This workshop will dive into considerations from all aspects and how to ensure animal health is maintained while interfacing with other trades and departments. One major challenge is interfacing with controls systems, and we will review DMX Programming, the way exhibit lighting can tie in with building lighting, and how to create common exhibit effects such as sunrise to sunset, lunar cycles for coral spawning, and varied looks for "extended hours" exhibits.

High-Rate Sand Filter Training - AALSO (Wet)

A general introduction of the High Rate Sand Filter; how it works, and a brief explanation of the parts of the filter. A Discussion and demonstration about filter operation and automation, different kinds of valves and valve sequencing, how to operate a filter manually when the automated controller fails. Different types of media available, mixed media, media grading and quantities. The importance of filter design to media performance. The advantages of deep bed filtration and the influence of filtration rate on performance of different media. A discussion and demonstration about filter backwashing; why we do it, when to do it, and how often. The importance of backwash velocity and bed expansion in backwash and routine maintenance for the filter bed.

Hydraulic Analysis Software - TJP Engineering (Dry)

Participants will be introduced to EPANET and its use to analyze LSS piping networks. EPANET is a public domain software that can be downloaded and used for free. This software platform is actually the foundation for several hydraulic analysis software products available for purchase today. The workshop will provide information about how EPANET can be utilized to model and analyze typical components and piping associated with an LSS.

Industrial Sumps: System Operation and Maintenance - MRC America (Wet)

The purpose of this BAWL workshop series is to provide an operational industrial "iSeries" sump with accompanying peripherals alongside the BAWL loop to demonstrate the following protocols:

- How to plan for and initiate basic sump maintenance with staff. Topics include filter sock change outs and cleaning, ongoing sump care, and long term unit upkeep
- Operation and maintenance of an Integrated UV system. Topics include lamp and sleeve changes, quartz sleeve care, proper flow/wattage selection, and ballast maintenance
- Moving and static bed bio-chamber selection, operation, and service
- Ambient monitor calibration frequency.
- Automatic roller mat system operation and service
- Fractionator technology comparisons and maintenance. This will cover both Beckett style and Needle wheel injection technologies and their associated care

Additionally, workshop attendees will be provided with a service template and checklist to follow up with staff members ensuring routine maintenance is achieved and accounted for on their own systems. Topics from this workshop will coordinate alongside the MRC "dry" sump workshop as well discussing initial sump design with integration into new systems or retrofitting old ones.

Intro to Ally Skills - Minorities in Aquarium & Zoo Science (Dry)

The advantages of having diverse teams, in any profession, greatly stem from having a wider spectrum of backgrounds, life experiences, perspectives, and ideas. This diversity in thought directly leads to more thorough preparation and greater innovation. To build more diverse teams, intentional actions are required at all career levels. "But what can one person do?" Each person's individual actions make a difference, whether they be at the individual, departmental, institutional, or industry level. With many people learning and practicing specific skills on taking individual allyship actions across all levels, more BIPOC (Black, Indigenous, and People Of Color)-friendly work environments with more inclusive hiring and retention practices can be cultivated. In this Intro to Ally Skills workshop, participants will learn what allyship is and what it isn't, learn about minority perspectives, and practice skills on how to act as an ally. Minorities and non-minorities from all career levels are invited to participate.

Laser Alignment of Pump and Motor Coupling – CECO Environmental – Fybroc Brand (Wet)

This presentation and alignment simulation will provide a brief tutorial of shaft alignment identifying the various types of misalignments, differences between shaft and coupling alignment and descriptions of the various methods of alignment including straight edge, dial indicator and laser. Utilizing a pump/motor coupling simulator the various methods of shaft alignment will be demonstrated highlighting the issues not identified by straight edge and/or dial indicator measurements. Finally, the laser alignment tool will be used to illustrate the condition of a motor "soft foot."

Level II: Actuation, from L&G to MOV - ASAHI (Wet Workshop)

This advanced course is designed for individuals who would like to enhance their expertise in actuation operations and troubleshooting. Participants will engage in hands-on activities, which will include selecting and installing electric actuators (such as on/off actuators and modulating options) onto valves on an operational piping system. The process will include removing installed manual operators and mounting the actuator and bracketry onto the valve. Participants will also connect control wiring to the actuator and a local Human Machine Interface (HMI) panel. Upon completion, the participant will verify operation of the actuator to ensure it was installed correctly.

LSS Fluid dynamics and Material Choices - IPEX (Dry)

This workshop will discuss flow calculations, with a focus on the use of thermoplastics in this application. Attendees will explore how material choice can affect system operation and efficiency. This session will also expand on the topic of Chapter 18 of the AALSO Field Guide, applied mathematics for life support, and review important flow characteristics of valves.

Maintaining Larger Pumps – CECO Environmental – Fybroc Brand (Wet)

This workshop will train and provide the attendees with the opportunity to perform the typical maintenance/repairs required on large non-metallic pumps. Subjects covered will include the various types of pump lubrication, changing pump oil (how much and how often), setting and/or replacing mechanical seals, axial adjustment of impellers, methods for removing threaded impellers, removal and/or replacement of INPRO shaft seals and finally a brief discussion and presentation of centrifugal pump cavitation.

Mastering Valve Selection & Maintenance - ASAHI (Dry Workshop)

Join us for an engaging, hands-on workshop designed to build your confidence and skills in valve selection and assembly for life support systems. This interactive session begins with a clear overview of common valve types, their practical applications, and unique benefits. Participants will observe live demonstrations on ball and butter valve assembly, swing check valve cleaning, and proper techniques for torquing flanges. Hands-on practice ensures you gain practical experience in a supportive environment.
- To keep things fun and interactive, a friendly contest will challenge participants to assemble and disassemble a ball valve as quickly as possible, with a leaderboard to recognize top performers. At the end of the workshop, participants will leave with a stronger understanding of valve systems and will take home a ball valve as a token of appreciation.
- This workshop is ideal for anyone looking to expand their technical skills while enjoying a collaborative, engaging learning experience!

Measurement and Evaluation of Ultraviolet Light Sources - Reef Brite (Wet)

This is a hands-on workshop and focuses on understanding UV light sources, their differences, and their safe use around animals and humans. Participants will be instructed on how to measure the presence of both UVA and UVB. They will learn how to determine safe ranges of exposure for both animals and handlers. Participants will also participate in underwater measurements for the presence of UV to demonstrate its effectiveness in penetrating water.

ORP Maintenance & Calibration, and available Flow Measurement Technologies as well as proper in-line installation of salinity, temp, & Dissolved Oxygen - GF Signet (Wet)

For ORP - Course will be focused on proper removal from live line, cleaning, conditioning, recommended frequency & calibration of ORP systems. For Flow- Will discuss available flow technologies Paddlewheel (mechanical) , Magnetic (no moving parts), and ultrasonic (non-intrusive). Going over features advantages and benefits of each. For the balance we will cover proper installation of salinity (avoiding dead spaces and bubbles) , Temp sensors in larger lines and options for mounting Dissolved Oxygen sensors.

Ozone Safety - AALSO (Dry)

This classroom style workshop will cover basic ozone safety topics such as:

- What Codes Govern Ozone
- What ambient air thresholds are allowable by code.
- What PPE should be used when entering an ozone-laden space
- Ambient monitor calibration frequency.

We will discuss recommendations for ozone generator rooms, emergency stops, transmitter locations and ambient alarm set points. Participants will be encouraged to share experiences and interact with the intent of gaining a better understanding of ideal ozone installations.

Ozone System Design and Integration – Satchell Engineering & Ozone Water Systems (Dry)

Participants in this class will be given a presentation on the key components that make up an ozone system, engineering factors that are considered when selecting various components, different ways of contacting ozone with water and various air prep systems.
This is a unique opportunity to get perspectives from the design side and the equipment provider side. Come with questions!

LSS System Design Principles: "The Big Picture" – Cloward H2O (Dry)

This session will discuss items to consider for LSS system design. This includes water quality factors and the systems to control them. We will investigate determining turnover times, filtration methods and sizing, piping and distribution. Will also address common system configurations and the pros & cons of each.

Ozone System Training and Maintenance - Ozone Water Systems (Wet)

On the BAWL we have a complete skid mounted ozone system. We will discuss design and review all of the components of an ozone system and the integrated safeties. This includes air prep, ozone generator, back flow prevention, injector, pump, contact tank, and ORP and ambient ozone monitors and review PM requirements for all of the components.

We will discuss and demonstrate the **Ozone Water Systems Industry Safety Standards.**

Safety for the Equipment (dew point, back flow prevent)

Safety for the Animal/ Fish (high ORP, signage, bubbles in water)

Safety for us People (bump test, signage, strobe, SOP)

We will demonstrate critical tests to ensure the safeties actual work. We hope you will bring this back to your facility and test your safety interlocks!

Plasma Block Ozone Generator Maintenance Troubleshooting and Repair- International Ozone (Dry)

Conduct hands-on training on the following:

- Troubleshooting ozone generators with plasma block
- Disassembly and cleaning of plasma blocks, YES you can do this yourself.
- Discussion on upgrading older ozone systems to newer types of ozone technology and existing infrastructure concerns.
- Discussion of attendee system challenges.
- Q&A with workshop presenter

Plate Heat Exchanger Preventative Maintenance – Delta Hydronics and Aqua Logic (Wet)

Hands-on discussion of plate heat exchanger components, basic design and general maintenance practices. Workshop will cover the principals of equipment sizing and aquatic application considerations. Workshop attendees will break down a small plate and frame heat exchanger, remove the plates, change the gaskets and reassemble the heat exchanger.

Protein Fractionation – The Keys to Successful Equipment Selection and Long-Term Operation - RK2 Systems, Inc. (Dry)

The process of protein fractionation has been in use within the zoo/aquarium industry for nearly forty years. While there have been many improvements to enhance the process, there has been even more debate over what can be done to maximize the efficiency of this process. The primary objective of this workshop is to explain how protein fractionators operate and why it is a valuable life support system, (LSS), component. Further, we will discuss the various types of protein fractionators currently available within the market, explaining each technology's associated benefits and limitations. With this understanding in mind, we will expand our discussion towards equipment selection criteria with topics ranging from bubble sizes and air to water ratios to the importance of flow designs, bombardment ratios, and contact time inside your protein fractionator. With a firm understanding of how to size our equipment, our conversation will shift towards understanding the cost of ownership and equipment efficiencies. Understanding that the manufacturing processes and materials vary will help us tackle what is needed, versus what "bells and whistles'' may look good but offer no improvement. Lastly, we will dispel the most common misconception associated with protein fractionation, "A protein fractionator should produce waste continuously or it is not working properly", by presenting scientific facts rather than myths put forward by manufacturers trying to provide undersized equipment to the industry.

Protein Fractionator Technologies, Installation, Maintenance – RK2 Systems, Inc. (Wet)

Workshop designed to provide an overview of protein fractionator technologies, highlighting the various benefits and limitations associated with each process. In addition to having participants learn assembly and cleaning protocols, we will cover how ozone works in conjunction with protein fractionation and close out the session with the group working through various troubleshooting scenarios in real time.

Protein Skimmers - Beyond the Foam

This hands-on Workshop is designed for beginning to intermediate aquatic specialists interested in the care and service of varying styles of foam fractionation units.
We will discuss and demonstrate various brands and types available on the market, showcase their features and benefits, differences in technologies, and allow participants to engage in the deconstruction, mock cleaning, and reassembly of the various units. Units will include both external and submersible configurations. After the workshop, attendees will be better prepared when designing and working on smaller systems.

Pump Sizing – MDM Inc (Dry)

A focus on all moving parts from mechanical seals and impellers to motor bearings and shafts, you'll gain the knowledge and skill set required to add value by keeping your pump systems functional while reducing downtime. Additional discussions on proper installation, VFD interface, duty point sizing, and optimal curve placement to duty-point via motor rpm control (turn-down or ramp-up) will be provided.

Review of biological lighting technology and practices for Zoos and Aquariums - Provolitan (Dry)

This workshop will look at the requirements of biological lighting in zoos and aquariums. It will discuss colour temperatures that are natural for animals within these collections and the impact of lighting on animals, practical installation processes, and lastly examine the true meaning of full spectrum lighting. The workshop will also review the requirements outlined by AZA and what these guidelines imply for facilities in their lighting installations and automation requirements. Lastly this workshop will aim to provide ideas on how to solve common lighting issues seen within facilities that have been historically problematic, but can now be solved

Small Pump Rebuild – MDM, Inc. (Wet)

Many people are unaware that small pumps can be rebuilt much in the same respects as their larger "cousins". Workshop attendees will be provided with the materials and tools to rebuild pumps including case disassembly/assembly, O-ring maintenance, as well as impeller, shaft seal, and motor replacement. Participants will also have the opportunity to remove and replace motor shaft bearings on sample motors using a hydraulic press.

The ABC's of VFD's – ABB (Dry)

Although Variable Frequency Drives (VFDs) are common in water and wastewater treatment plants for collection and distribution systems, the value they provide and how to properly select and use them are often not fully understood. This presentation will demystify VFDs, providing a better understanding as to where and why you would use them.
Attendees will leave with the ability to:

- Be aware of safety considerations.
- Identify applications that can benefit from VFDs.
- Understand the inherent value they provide.
- Recognize what needs to be considered to appropriately size and select VFDs.
- Be aware of proper installation considerations for a successful solution.

Ultraviolet Technology: From Lab Science to Field Application - Xylem (Dry)

Explore the transformative role that ultraviolet (UV) technology can play in Life Support Systems (LSS) for aquatics facilities, zoos, and aquariums. This 1.5-hour session covers the science, design, and application of UV disinfection systems. Following the class, participants will be equipped with the knowledge to select and implement UV solutions for their facilities. Topics include an overview of UV system types, ultraviolet transmittance (UVT) considerations, construction and operation principles, validation testing, and a comparison of UV and ozone treatments. Whether you're designing a new facility or optimizing an existing one, this course will provide actionable insights to help enhance water quality and protect aquatic life. Ideal for LSS professionals, facility operators, and engineers, this session combines technical knowledge with practical applications to address real-world challenges in LSS environments.

UV Sterilizer Maintenance – RK2 (Wet)

Hands-on workshop where participants will remove, clean and replace quartz sleeves. Participants will learn and physically replace O-ring seals, contacts and bulbs on a UV sterilizer and will learn about life expectancy of various bulbs along with recommended frequency of maintenance.

Variable Frequency Drives; Troubleshooting- ABB (Wet)

Variable Frequency Drives (VFDs) are common in most municipal water systems. This presentation will cover basic problems and nuisance trips which may be encountered with VFDs. Safety comments and wiring tips will be covered as well.

Attendees should gain:

- An awareness of safety considerations.
- Grounding considerations.
- Common approach questions for resolutions.
- Typical fault and nuisance fault message utilized for VFDs.
- An awareness that VFDs are self-protecting devices.

Water Quality

Basic Water Chemistry - Testing Techniques - AALSO (Water Quality)
This workshop will provide basic information, tips, and tricks on performing the common water quality tests that are crucial to the operation of a zoo or aquarium system. This 45-minute workshop will demonstrate and provide an opportunity to work with a variety of laboratory equipment used for common testing like Nitrogen Cycle (Ammonia, Nitrite, and Nitrate), Chlorine, Bromine, Phosphate, Copper, pH, Temperature and Salinity. The focus of this workshop is to compare testing methods with cost and accuracy.

Water Quality Lab Safety - AALSO (Water Quality)
This lecture will provide an overview of Laboratory Safety. This 45-minute lecture will cover basic laboratory best practices in safety standards like laboratory hazards, personal protective equipment, storage of chemicals, chemical spills and laboratory green practices. The focus of this lecture is laboratory safety best practices.

Water Quality Equipment Options - AALSO (Water Quality)
This lecture will provide an overview of the equipment needed in a water quality laboratory that supports the operation of a zoo or aquarium system. This 45-minute lecture will cover chemicals, glassware, laboratory supplies, electronics, spectrometers, meters, and burets. The focus of this lecture is from set up to expansion and will highlight what equipment is needed at a variety of budget levels.

Water Quality Lab QAQC - AALSO (Water Quality)
This lecture will provide a deeper dive into advanced Laboratory QAQC and best practices to ensure high quality data from your water quality testing. This 45-minute lecture will cover best practices for quality assurance, detailed explanations of the types of QC employed by laboratories, calculations for QC, theory behind uncertainty and detection limits, and method development (including method/calibration curve setup and validation).The focus of this lecture is laboratory quality control and quality assurance best practices.

Water Quality Ask Me Anything - AALSO (Water Quality)
This workshop will be a roundtable of water quality experts who will be available to participants to ask questions, get advice, or just discuss the latest and greatest in water quality. This 45-minute round table will provide an open forum to chat about any and all things water quality with some of the most experienced professionals at AALSO.

Exam Prep

Life Support Levels 1 and 2 Certification Exam Prep - LSS Certification Committee
This workshop will cover the format of the certification exams and focus on the math and calculations found in the AALSO Field Guide.

Life Support Level 3 Certification Exam Prep - LSS Certification Committee
This workshop will cover material for the Life Support Level 3 exam through an example problem and will allow time for discussion.

Water Quality Levels 1 and 2 Certification Exam Prep - Water Quality Certification Committee
This workshop will cover the format of the certification exams and focus on the math and calculations found in the AALSO Field Guide.

Water Quality Level 3 Certification Exam Prep – Water Quality Certification Committee This workshop will cover material for the Water Quality Level 3 exam through example problems.

Certification Exams

Life Support Level 1 Exam: 60 minutes for level 1

The life support operator certification acknowledges general operator proficiency with tasks ranging from basic routine operations to advanced applications and theory, covering topics such as: sand filtration, biological filtration, chemical filtration, cathodic protection, turbidity, safety, pump curves, troubleshooting, pool volume calculations, filter surface area calculations, and pool turnover rate calculations.

Eligibility: Current AALSO members who are any one of the following: actively employed in the animal care industry, provides goods and services to the animal care industry, students from aquarium-based programs, or working in a related field and looking to transition into a life support or water quality role. It is possible to take both the level 1 LSS and level 1 WQ exam during the same symposium.

25 Multiple Choice Questions

- 15 Operational Questions
- 5 Safety and Regulatory Questions
- 5 Mathematical Calculations

Life Support Level 2 Exam: 60 minutes for level 2

The life support operator certification acknowledges general operator proficiency with tasks ranging from basic routine operations to advanced applications and theory, covering topics such as: sand filtration, biological filtration, chemical filtration, cathodic protection, turbidity, safety, pump curves, troubleshooting, pool volume calculations, filter surface area calculations, and pool turnover rate calculations.

Eligibility: Current AALSO members who are any one of the following: actively employed in the animal care industry, provides goods and services to the animal care industry, and students from aquarium-based programs. In order to sit for the level 2 exam, you must have passed the level 1 exam with a score of 70% or higher. Please note, you are unable to sit for a level 1 and then proceed to a level 2 exam during the same symposium.

25 Multiple Choice Questions

- 14 Operational Questions
- 4 Safety and Regulatory Questions
- 7 Mathematical Calculations

Life Support Level 3 Exam: 90 minutes for level 3

The life support operator certification acknowledges general operator proficiency with tasks ranging from basic routine operations to advanced applications and theory, covering topics such as: sand filtration, biological filtration, chemical filtration, cathodic protection, turbidity, safety, pump curves, troubleshooting, pool volume calculations, filter surface area calculations, and pool turnover rate calculations.

Eligibility: Current AALSO members who are any one of the following: actively employed in the animal care industry or provides goods and services to the animal care industry. In order to sit for the level 3 exam, you must have passed both the level 1 exam and the level 2 exam with a score of 70% or higher. Please note, you are unable to sit for a level 2 and then proceed to a level 3 exam during the same symposium. If you are sitting for a level 3 exam, you are not eligible to sit for an additional exam during the same symposium.

Certification Exams (cont.)

Water Quality Level 1 Exam: 60 minutes for level 1

The water quality technician certification acknowledges general operator proficiency with tasks ranging from basic laboratory techniques to advanced applications and theory, covering topics such as: laboratory safety, laboratory equipment and measurements, quality assurance and assessment, nitrification, denitrification, basic microbiology monitoring, understanding stoichiometry and chemical reactions and dilutions.

Eligibility: Current AALSO members who are any one of the following: actively employed in the animal care industry, provides goods and services to the animal care industry, students from aquarium-based programs, or working in a related field and looking to transition into a life support or water quality role. It is possible to take both the level 1 LSS and level 1 WQ exam during the same symposium.

25 Multiple Choice Questions

- 10 Water Quality Testing Theory Questions
- 5 Safety and Regulatory Questions
- 4 Analytical Equipment Questions
- 5 Quality Control/Quality Assurance Questions
- 1 Mathematical Calculation

Water Quality Level 2 Exam: 60 minutes for level 2

The water quality technician certification acknowledges general operator proficiency with tasks ranging from basic laboratory techniques to advanced applications and theory, covering topics such as: laboratory safety, laboratory equipment and measurements, quality assurance and assessment, nitrification, denitrification, basic microbiology monitoring, understanding stoichiometry and chemical reactions and dilutions.

Eligibility: Current AALSO members who are any one of the following: actively employed in the animal care industry, provides goods and services to the animal care industry, and students from aquarium-based programs. In order to sit for the level 2 exam, you must have passed the level 1 exam with a score of 70% or higher. Please note, you are unable to sit for a level 1 and then proceed to a level 2 exam during the same symposium.

25 Multiple Choice Questions

- 8 Water Quality Testing Questions
- 6 Chemistry Questions
- 4 Safety and Regulatory Questions
- 9 Mathematical Calculations

Water Quality Level 3 Exam: 90 minutes for level 3

The water quality technician certification acknowledges general operator proficiency with tasks ranging from basic laboratory techniques to advanced applications and theory, covering topics such as: laboratory safety, laboratory equipment and measurements, quality assurance and assessment, nitrification, denitrification, basic microbiology monitoring, understanding stoichiometry and chemical reactions and dilutions.

Eligibility: Current AALSO members who are any one of the following: actively employed in the animal care industry, provides goods and services to the animal care industry, and students from aquarium-based programs. In order to sit for the level 3 exam, you must have passed both the level 1 exam and the level 2 exam with a score of 70% or higher. Please note, you are unable to sit for a level 2 and then proceed to a level 3 exam during the same symposium. If you are sitting for a level 3 exam, you are not eligible to sit for an additional exam during the same symposium.