

**Model Aquatic Health Code
Draft Lifeguarding and Bather Supervision Module ANNEX Section
Modified after the First 60-day Review that
Closed on 10/14/2012**

Informational Copy: NOT Currently Open for Public Comment

NOTE: Due to the large number and extent of comments related to the Lifeguarding and Bather Supervision Module, the entire module (Code and Annex) has been extensively revised, re-written, and re-organized to best address these comments.

This version of the MAHC Lifeguarding and Bather Supervision Module has been modified based on the first round of public comments received. It is being re-posted so users can view how it was modified but is not currently open to public comment. The complete draft MAHC, with all of the individual module review comments addressed will be posted again for a final review and comment before MAHC publication. This will enable reviewers to review modules in the context of other modules and sections that may not have been possible during the initial individual module review. The public comments and MAHC responses can be viewed on the web at <http://www.cdc.gov/healthywater/swimming/pools/mahc/structurecontent/index.html>

The MAHC committees appreciate your patience with the review process and commitment to this endeavor as we all seek to produce the best aquatic health code possible.

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MAHC Lifeguarding and Bather Supervision Module Abstract

Health and safety issues related to bather supervision and lifeguarding for both the patron and the potential rescuer at an aquatic facility are increasingly being documented. The Lifeguarding and Bather Supervision Module is a first step towards improving the consistency in training, lifeguard management and supervision, lifeguard competency for guarded facilities and effective bather supervision at unguarded facilities. The Lifeguarding and Bather Supervision Module contains requirements for unguarded and guarded aquatics along with the training necessary to be a qualified lifeguard. The module includes:

- 1) Standards determining which aquatic facilities need to be guarded and which may not need qualified lifeguards including supervision requirements for those aquatic facilities not required to have lifeguards.
- 2) A Safety Plan guide including pre-service, in-service, staffing, single lifeguard, lifeguard management and Emergency Action Plan requirements.
- 3) Requirements for aquatic facilities to define, diagram, and document required zones of patron surveillance.
- 4) Determination of what constitutes effective staffing by the ability of the lifeguard to reach all areas of their zone of patron surveillance within a certain time frame.
- 5) Required lifesaving equipment, communications standards, and general requirements for lifeguards and lifeguard supervision/management training.

The Lifeguarding and Bather Supervision Code Module shows a Table of Contents giving the context of the Disinfection and Water Quality Design, Construction, Operation and Maintenance in the overall Model Aquatic Health Code's Strawman Outline (<http://www.cdc.gov/healthywater/pdf/swimming/pools/mahc/structure-content/mahcstrawman.pdf>).

Note on the MAHC Annex

Rationale

The annex is provided to:

- (a) Give explanations, data, and references to support why specific recommendations are made;
- (b) Discuss the rationale for making the code content decisions;
- (c) Provide a discussion of the scientific basis for selecting certain criteria, as well as discuss why other scientific data may not have been selected, e.g. due to data inconsistencies;
- (d) State areas where additional research may be needed;
- (e) Discuss and explain terminology used; and
- (f) Provide additional material that may not have been appropriately placed in the main body of the model code language. This could include summaries of scientific studies, charts, graphs, or other illustrative materials.

Content

The annexes accompanying the code sections are intended to provide support and assistance to those charged with applying and using Model Aquatic Health Code provisions. No reference is made in the text of a code provision to the annexes which support its requirements. This is necessary in order to keep future laws or other requirements based on the Model Aquatic Health Code straightforward. However, the annexes are provided specifically to assist users in understanding and applying the provisions uniformly and effectively. They are not intended to be exhaustive reviews of the scientific or other literature but should contain enough information and references to guide the reader to more extensive information and review.

It is, therefore, important for reviewers and users to preview the subject and essence of each of the annexes before using the document. Some of the annexes (e.g., References, Public Health Rationale) are structured to present the information in a column format similar to the code section to which they apply. Other annexes or appendices provide information and materials intended to be helpful to the user such as model forms that can be used, recreational water illness outbreak response guidelines, and guidelines for facility inspection.

Appendices

Additional information that falls outside the flow of the annex may be included in the Model Aquatic Health Code Annex

Acronyms and Initialisms in this Module: See the Lifeguarding and Bather Supervision Module, Code Section

Glossary Terms in this Module: See the Lifeguarding and Bather Supervision Module, Code Section

Preface: *This document does not address all health and safety concerns, if any, associated with its use. It is the responsibility of the user of this document to establish appropriate health and safety practices and determine the applicability of regulatory limitations prior to each use.*

Model Aquatic Health Code
Lifeguarding and Bather Supervision Module Code
4.0 Design and Construction Annex

4.0 Design Standards and Construction

- 4.1 Plan Submittal**
- 4.2 Materials**
- 4.3 Equipment Standards**
- 4.4 Pool Operation and Facility Maintenance**
- 4.5 Aquatic Venue Design**

4.5.1 Design for Risk Management LG

Working with the QUALIFIED OPERATOR and/or aquatic risk management consultant, the designer can outline the anticipated zones of patron surveillance and place fixed lifeguard stations accordingly. It is important to have a person knowledgeable in aquatic risk management to advise on placement of fixed lifeguard stations and the general design of the AQUATIC VENUE as it relates to placement of lifeguards so to avoid blind spots, glare issues, and other obstructions being included in the design. This also allows the QUALIFIED OPERATOR to influence design so it meets the anticipated labor requirements. In some operations where the pool design requires more lifeguards, this puts pressure on QUALIFIED OPERATORS to minimize labor by extending zones of patron surveillance. Small design changes could reduce zone size without taking away from patron enjoyment.

4.6.5 First Aid Station

4.6.5.1 Station Design LG

A conveniently designated first aid station location should be provided for use when bathers report with minor injuries and/or illness. The first aid station must be easy to locate and must have first aid supplies to care for minor injuries and more serious injuries until emergency assistance can arrive. Some AQUATIC FACILITIES may have a formal First Aid Station that is a standalone and others may have a location for first aid equipment. The committee felt it would allow for flexibility in design to call out the location for first aid equipment rather than designate a standalone station. Some AQUATIC FACILITIES are large and a single first aid station is not as practical as distributing first aid equipment throughout the facility (e.g., to individual AQUATIC VENUES). From a design standpoint, the designer must address the location of such equipment and as stated in MAHC Section 4.5, should work with the QUALIFIED OPERATOR and/or aquatic risk management consultant to designate these locations.

4.8.1 Decks LG

4.8.1.1 Lifeguard Placement LG

See MAHC Section 4.6.5.1 for operational considerations in design.

4.8.1.2 Deck Clearance LG

Four feet of clearance would allow for safe movement of a lifeguard roaming or for extrication in case of an emergency. This is consistent with the design guidance of the MAHC.

4.8.1.3 Access Points LG

In locations where perimeter deck is non-contiguous and the clearance is not at least 4 feet, such as where fencing is provided around elevated pool edges and lazy rivers, locations for lifeguards to safely access the pool edge should be required. This facilitates a safe entry rather than climbing over any fence or other obstruction.

4.8.1.4 Patron Zone Surveillance LG

Designers have historically added AQUATIC FEATURES that are not readily visible on a site plan nor are their effects self-evident until installed during construction. This could result in additional lifeguards to facilitate zone coverage or create small blind spots. For this reason, this line item was added for the designer to consider.

4.8.5 Safety Related Equipment LG

4.8.5.1 Safety Equipment required at all Aquatic Facilities LG

4.8.5.1.1 Communication Equipment LG

4.8.5.1.1.1 Communication Device LG

A communication device is required in the Operations section, but it also needs to be considered in the design so the designer can plan for the wiring for such devices.

4.8.5.1.1.2 Internal Communication LG

Often AQUATIC VENUES can be at a distance from support personnel and the designer should consider methods for personnel to communicate whether via radio, telephone, intercom, or other method.

4.8.5.1.2 First Aid Equipment

4.8.5.1.3 Signage

4.8.5.1.4 Safety Equipment Required at Aquatic Facilities with Lifeguards

4.8.5.1.4.1 Lifeguard Chair and Stand Placement LG

This line item refers to only those chairs that are permanently installed and does not indicate that a permanent chair or stand is required. The location of the chairs must give the lifeguard complete visibility to all parts of the zone of patron surveillance. The number of chairs is determined by the ability to provide surveillance of the AQUATIC VENUE by creating zones of patron surveillance. It is intended that the designer should be working with an aquatic consultant or the owner/operator to make sure the location of chairs and stands allow for clear line of sight.

4.8.5.1.4.2 Lifeguard Chair and Stand Design LG

Chairs and stands are exposed to elements; therefore, they should be made to withstand the environment. The intent for such a chair is to facilitate better surveillance and such the chair should be elevated sufficiently above the heads of bathers to have a better view and combat glare. Considerations for the safety of lifeguards using these chairs should include access and egress as well as barriers to unauthorized access if installed at an elevation.

4.8.5.1.4.3 UV Protection for Chairs and Stands LG

Protection from ultraviolet radiation exposure can include a shade attached to the stand, a shade structure external to the stand, or other types of shade such as surrounding features. The designer should consider which method will be employed to provide UV protection for the stand.

Model Aquatic Health Code
Lifeguarding and Bather Supervision Module
5.0 Operation and Maintenance Annex

5.0 Operation and Maintenance

- 5.1 Plan Submittal**
- 5.2 Materials**
- 5.3 Equipment Standards**
- 5.4 Pool Operation and Facility Maintenance**
- 5.5 Pool Structure**
- 5.6 Indoor / Outdoor Environment**
- 5.7 Recirculation and Water Treatment**
- 5.8 Decks and Equipment**

5.8.1 Decks

5.8.2 Diving Boards and Platforms

5.8.3 Starting Blocks

5.8.4 Deck Slides

5.8.5 Safety Related Equipment

5.8.5.1 Equipment Inspection and Maintenance LG

The absence of this required equipment can adversely affect the effectiveness of a rescue and the safety of the lifeguard. It could also hinder the response from emergency services. For this reason, it is the responsibility of the owner/operator to make sure this equipment is in place prior to opening the AQUATIC FACILITY to the public.

The equipment should be working so it can be used when needed. The word "safe" makes sure the equipment is not modified to be in working condition but posing a risk to the user.

5.8.5.2 Safety Equipment Required at All Aquatic Facilities LG

5.8.5.2.1 Communication Equipment LG

5.8.5.2.1.1 Functioning Communication Equipment LG

As stated in the design section, emergency communication devices should be part of the design but also required to be present in the operation.

5.8.5.2.1.2 Hard Wired Telephone for 911 Call LG

1. The AQUATIC FACILITY must be provided with the tools necessary for rapid and effective emergency communication. These tools might include a telephone, emergency band radio or other effective means of communication.
2. Having a reliable telephone available during an emergency is important. Frequently cellular telephones, cordless telephones and other self-powered devices are not ready for use. Having a hard wired telephone provides that reliability.
3. The telephone must be available to all AQUATIC VENUE users for use in an emergency, anytime the pool is open for use. Pay telephones must be able to dial 911 without the use of coins or cards and maintained in an operable condition.
4. The communication device should be placed in a manner where bathers can see and reach the device within about 1 minute and be placed so there are no obstructions to reaching it. The response time by the proper emergency agency has been shown to make a difference in patient outcome.¹

5.8.5.2.1.3 Alternate Communication Systems or Devices LG

The intent is that an emergency phone or communications system or device is immediately available to patrons from all AQUATIC VENUES within an AQUATIC FACILITY. Some alternate communication systems might include a handset or intercom system to a location that is constantly manned whenever the AQUATIC VENUE is open for use (e.g. a front desk at a hotel, the check in desk at a fitness club, or other continuously manned location); a commercial emergency contact device that connects to a monitoring service, or directly to 911 dispatch; or devices that alert multiple staff on site when activated (e.g. pagers systems, cellular telephone systems and radio communication alert systems).

5.8.5.2.2 First Aid Equipment LG

5.8.5.2.2.1 Location for First Aid LG

This is stated in the design section but also stated in the MAHC Operations section to require the operator to designate a first aid location for existing facilities. The supplies should be provided at locations where they can be quickly accessed by staff responding to emergencies.

5.8.5.2.2.2 First Aid Supplies LG

The first aid supply list is based on the ANSI /ISEA Z308.1-2009 standard for a Workplace First Aid Basic Kit. The listed contents are based on the items needed, but the quantities are not specified to allow for flexibility based on the size of the AQUATIC

¹ EMS World Response Time Standards: <http://www.emsworld.com/article/10324786/ems-response-time-standards>

FACILITY, the anticipated bather load, anticipated number and types of injuries, and the number of first aid locations. Topical supplies such as antibiotic cream, burn gels, and antiseptics were removed because this poses a scope of practice issue for the level of training typical to lifeguarding.

The operator should provide enough supplies that the kit does not need continuous restocking. There should be enough supplies to last between first aid kit supply inspections, plus the time needed to obtain and replace the supplies. The contents should be inspected and resupplied often enough to maintain the supplies in good condition.

The supplies must be stored in such a manner as to protect them from moisture and extremes of heat and cold that will cause deterioration. Supplies must be periodically checked for expiration dates and replaced as needed.

A biohazard cleanup kit was included as lifeguards often deal with body fluids on surfaces such as vomit, feces, and blood. According to OSHA², "Generally, lifeguards are considered to be emergency responders and, therefore, would be considered to have occupational exposure. Emergency response is generally the main responsibility of lifeguards, therefore, such duties could not be considered collateral. Although it is the employer's responsibility to determine which, if any, of the employees have occupational exposure, employers of lifeguards should examine all facets of the lifeguard's emergency response duties, not just "retrieval from deep water." As a result, lifeguards are covered under OSHA 29 CFR 1910.1030 Bloodborne Pathogens standard, which speaks to having contact with individuals that may be injured and bleeding. As a result, employers are required to offer all the protections of the Bloodborne Pathogens standard. Management should also consider how bloodborne pathogen training is integrated with training for environmental and/or water-based clean-up of feces and other body fluids (MAHC 6.5).

The Committee chose to compile this list after reviewing the contents of several kits that were commonly available.

One complete blood borne pathogen spill kit is needed at the AQUATIC FACILITY. Example of minimum suggested contents:

- a) Disposable gloves*,
- b) Disposal gown or apron, facemask, shoe covers,
- c) Face Shield,
- d) Anti-microbial wipes,
- e) Biohazard Bag,
- f) Disinfectant (ex. calcium hypochlorite packet – 1 oz.),
- g) Absorbent materials or fluid solidifier (~20gm),
- h) Scoops for solidified material,

² Occupational Safety and Health Administration (OSHA). Coverage of Lifeguards under 29 CFR 1910.1030. July 9, 1993. Corrected 08/16/2007. Accessed March 1, 2014 at https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=21197

- i) Scraper, and
- j) Instructions for use.

* Do not use latex gloves. Gloves should be single use, vinyl or nitrile and non-powdered. Gloves should be disposed of after one use. Fit is important. It is recommended that 4 to 6 mil. gloves be used.

** It is suggested that a kit be assembled, put in a container and sealed to assure the contents are still intact when needed. After use, a new kit is provided or the container is restocked and resealed.

In addition to the AQUATIC FACILITY kit, lifeguards should carry basic PPE for immediate use during initial exposure to feces, vomit and small amounts of blood until the full kit arrives at the treatment scene as described in MAHC 5.8.3.9

AEDs were considered to be included in this list, but due to the requirement for medical direction for AED use by trained rescuers, it was not included as it may not be within the AHJ's authority to mandate such equipment. However, AEDs are widely used and can be used for submersion events and any cardiac incident. If local protocols can be established, it is recommended to have an AED.

5.8.5.2.3 Signage

5.8.5.2.3.1 Sign Indicating First Aid Location LG

Effective signage must communicate where first aid assistance can be obtained. This is especially important in smaller AQUATIC FACILITIES and at AQUATIC FACILITIES not requiring lifeguards where the first aid station might be outside the immediate AQUATIC VENUE area. Signage is also important at very large AQUATIC FACILITIES where the first aid station might be harder to find. Effective signage should follow the standards established by ICC A117.1-2009 and ADA Accessibility Guidelines including sign height, raised or Braille lettering, and placement.

Emergency telephones or communication devices are usually in conspicuous locations; however, those locations should be communicated so bathers and staff alike know where they are and can rapidly locate them.

5.8.5.2.3.2 Emergency Dialing Instruction LG

Signage must be posted at the telephone or approved communication system or device with emergency contact number(s) or procedures and the address of the AQUATIC FACILITY. Often a person in an emergency situation can be confused, so having the address of the AQUATIC FACILITY, emergency number(s) at the telephone, and special instructions, if any, makes responding easier.

5.8.5.2.3.3 Management Contact Info LG

An owner/operator contact number must be provided for notification of water quality and safety concerns. At AQUATIC FACILITIES where QUALIFIED OPERATORS are not present at all times, it is important for patrons to be able to contact the owner/operator when water

quality has been compromised (ex. cloudy water, fecal matter in the water, and/or other issues of concern related to water quality or safety).

5.8.5.2.3.4 Hours of Operation LG

Operating hours for an AQUATIC FACILITY should be posted and clearly visible at the AQUATIC FACILITY, especially when the AQUATIC FACILITY is not attended at all times by an operator or lifeguard.

5.8.5.3 Safety Equipment Required at Aquatic Facilities with Lifeguards LG

5.8.5.3.1 UV Protection for Chairs and Stands LG

In the design section (MAHC), permanently installed chairs and stands are required to be designed with UV protection. In the Operations section, it is required to have the UV protection present. Regardless of when the chair or stand was constructed, UV protection is required to protect the lifeguard from an occupational exposure.

5.8.5.3.2 Spinal Injury Board LG

Spinal injury boards facilitate immobilization of a person with a suspected spinal injury. Because these boards are often used in or around the water, their construction should be of materials that can withstand the environment and be easily sanitized/disinfected between uses. Boards must be properly maintained and in good repair. An example is using a wooden backboard that is worn so the wood is exposed and no longer cleanable. In this case refinishing it with a waterproof finish should again make it cleanable. The head immobilizer and straps are commonly used in lifeguard training programs and these tools assist in the immobilization of a person on the board and should be present during operation. Deciding which straps to be included should consider how to best immobilize the person to the board. Common locations for straps are at the upper torso, the hips, and legs.

The number of spine boards available at the AQUATIC FACILITY should be dependent on the size of the AQUATIC FACILITY. It would be difficult to determine the exact number but a general consideration should be to have a spine board reach the location it is needed within a couple of minutes. There should not be a delay: the person needing to be extricated from the water will need to be held in an immobile position in the water. To extricate without a spine board can cause more damage to the person.

5.8.5.3.3 Rescue Tube Immediately Available LG

The 50th percentile adult is at least 64 inches (1.6 m) tall. The rationale is that the average adult bather's head would be above the static water line and they could use the AQUATIC VENUE without difficulty. Due to buoyancy considerations at chest level, a short lifeguard could have difficulty doing a rescue safely without equipment. For this reason, the rescue tube is required unless there is less than 3 feet (0.9 m) of depth in which their chest would likely be above the static water line.

Lifeguard training agencies have determined that the use of a rescue tube makes

rescues safer for both the victim and the rescuer. The rescue tube provides a barrier between the victim and the rescuer as well as a handhold for both during a rescue.

In very shallow water, the rescue tube may not be as effective so the language in the code is flexible to allow for the rescue tube to be available immediately, but is not required to be worn. However, as stated above, the rescue tube provides protection for the lifeguard so the operator should determine the level of risk and requirement for wearing the rescue tube based on the aquatic venue depth, activities, and frequency of rescue.

5.8.5.3.4 Rescue Tube on Person LG

Being properly prepared to respond to an emergency requires wearing the harness strap attached to the rescue tube and keeping the rescue tube in a position and location where it can be immediately used.

It is important to wear the rescue tube in a rescue ready position. Wearing the strap and sitting with the tube at the lifeguard's feet, or in any other position except held against the body, can lead to situations where a lifeguard is injured or cannot respond because the tube's strap is wrapped around handrails, chair pedestals or other catch points. Management should reinforce through pre-service, in-service, and employment policy that the lifeguards are expected to hold the rescue tube in a manner taught and accepted by the lifeguard training agency.

5.8.5.3.5 Identifying Uniform LG

There should be no delay in care because a patron is unable to find a member of the AQUATIC FACILITY SAFETY TEAM. Distinct uniforms are a standard in most industries to identify workers and their assigned tasks.

5.8.5.3.6 Signal Device LG

The most basic communication method used by lifeguards is a combination of whistle blasts and hand signals to communicate with each other, patrons, and management. Whistle signals can communicate when to clear the pool, get another lifeguard's or supervisor's attention and communicate emergencies.

The devices and their use can vary depending on the AQUATIC FACILITY and its management. Because of inherent background noise, whistles, hand signals, emergency buttons, radios, and telephone handsets are used to provide more effective communication

5.8.5.3.7 Sun Blocking Methods LG

Protection from direct sun exposure is a necessary part of lifeguarding at AQUATIC FACILITIES. . Gone are the days when the objective of the lifeguard was to get as deep a tan as possible. Today, sun exposure, especially when the skin becomes burned, increases significantly the risk of skin cancers.

In a recent study of melanoma, it was noted that the melanoma DNA contained 33,000

mutations, many of which may have come from ultraviolet light exposure.³

The best sunscreens available at the present time are broad spectrum or full spectrum and are usually so labeled. More will probably become available as new Food and Drug Administration rules are implemented.⁴ These protect against both UVA and UVB rays as long as re-application is conducted periodically. Because SPF ratings only measure UVB effectiveness there is a lot of variability in UVA protection in sunscreens. The CDC recommends a sunscreen with an SPF of at least 15.⁵

There are some questions about the health effects of some of the screening chemicals, but the benefits seem to outweigh the hazards. To minimize exposure to these chemicals, lifeguards should also wear protective clothing, hats, use sun-blocking umbrellas, or any other means to avoid exposure to UV light. Protection is also needed from reflected exposure. Light-skinned individuals can be particularly sensitive to both direct as well as indirect exposure to the sun's UV rays.⁶ Employers should educate lifeguards about the risk and protection options but are exempted from requirements to pay for sunscreen as personal protective equipment according to OSHA 1910.132(h)(4)(iii).⁷

5.8.5.3.8 Polarized Sunglasses LG

Glare and reflected sunlight off the water surface can cause significant visibility problems for lifeguards and potentially impact job performance. Lifeguards working at outdoor venues are required to wear polarized eye wear to reduce the risk of glare causing reduced visibility. This polarized eyewear should also be a part of any sun exposure awareness training since it also potentially reduces the harmful short- and long-term effects of UV on eyes that include increased risk for cataracts and macular degeneration^{8,9,10,11,12,13,14}. However, employers are exempted from requirements to pay

³ Pleasance ED, et al. A comprehensive catalogue of somatic mutations from a human cancer genome. *Nature*. 2010;463:7278;191-6. PUBMED:20016485; DOI:10.1038/nature08658.

⁴ 21 CFR Parts 201 and 310, Labeling and Effectiveness Testing; Sunscreen Drug Products for Over-the-Counter Human Use.

⁵ CDC/NIOSH. UV Radiation [online]. [cited 2014 Feb 6.] Available from: <http://www.cdc.gov/niosh/topics/uvradiation/>.

⁶ IARC monographs on the evaluation of carcinogenic risks to humans. Solar and ultraviolet radiation. *IARC Monogr Eval Carcinog Risks Hum*. 1992;55:1-316. PMID:1345607

⁷ Occupational Safety and Health Administration (OSHA). Personal Protective Equipment standard 1910.132 Accessed March 1, 2014 at

https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9777

⁸ Krutmann J et al. Towards standardization of UV eye protection: what can be learned from photodermatology? *Photodermatol Photoimmunol Photomed*. 2013 Nov 8. doi: 10.1111/phpp.12089.

⁹ Glickman RD. Ultraviolet phototoxicity to the retina. *Eye Contact Lens*. 2011 Jul;37(4):196-205.

¹⁰ Roberts JE. Ultraviolet radiation as a risk factor for cataract and macular degeneration. *Eye Contact Lens*. 2011 Jul;37(4):246-9.

¹¹ Glickman RD. Phototoxicity to the retina: mechanisms of damage. *Int J Toxicol*. 2002 Nov-Dec;21(6):473-90.

¹² McCarty CA et al. A review of the epidemiologic evidence linking ultraviolet radiation and cataracts. *Dev Ophthalmol*. 2002;35:21-31.

¹³ Roberts JE. Ocular phototoxicity. *J Photochem Photobiol B*. 2001 Nov 15;64(2-3):136-43.

¹⁴ Taylor HR. Ultraviolet radiation and the eye: an epidemiologic study. *Trans Am Ophthalmol Soc*. 1989;87:802-53.

for sunglasses as personal protective equipment according to OSHA 1910.132(h)(4)(iii).¹⁵

Polarized eyewear can assist with glare indoors as well but should be tested so it does not impede visibility due to lower light levels.

Polarized 3-D glasses must not be used as they can be disorienting and can disrupt normal vision.

5.8.5.3.9 Personal Protective Equipment LG

Appropriate personal protective equipment (PPE) must be provided to all employees that have possible occupational exposures. Lifeguards should carry or have immediately available basic PPE (disposable gloves and CPR mask) for immediate use during initial exposure to feces, vomit, and small amounts of blood until the full facility bloodborne pathogen kit arrives at the treatment scene. This could be in a small pouch to be carried on the lifeguard, a pouch associated with the rescue tube, or at a location near the lifeguard position. The intent is that the lifeguard does not need to leave the immediate area to find PPE nor will it create a delay in response.

OSHA Blood borne Pathogen Regulations¹⁶, require that the employer shall provide, at no cost to the employee, appropriate personal protective equipment such as, but not limited to, gloves, gowns, laboratory coats, face shields or masks and eye protection, and mouthpieces, resuscitation bags, pocket masks, or other ventilation devices. Personal protective equipment will be considered "appropriate" only if it does not permit blood or other potentially infectious materials to pass through to or reach the employee's work clothes, street clothes, undergarments, skin, eyes, mouth, or other mucous membranes under normal conditions of use and for the duration of time which the protective equipment will be used.

5.8.5.3.10 Rescue Throwing Device LG

If the single lifeguard is engaged in a rescue and another person is in distress, the rescue throw device allows for an untrained individual to assist the distressed person.

5.8.5.3.11 Reaching Pole LG

If the single lifeguard is engaged in a rescue and another person is in distress, the reaching pole allows for an untrained individual to assist the distressed person.

5.8.5.4 Safety Equipment Required at Aquatic Facilities without Lifeguards LG

5.8.5.4.1 Throwing Device LG

¹⁵ Occupational Safety and Health Administration (OSHA). Personal Protective Equipment standard 1910.132 Accessed March 1, 2014 at https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9777

¹⁶ 29 CFR 1910.1030, Toxic and Hazardous Substances – Blood borne Pathogens

A rescue throwing device is a throw bag, buoyant life ring, torpedo buoy or other easily thrown buoyant device that is designed for a person on the deck to throw it to a person in distress in the aquatic venue. Fifty feet (15.2 m) of minimum ¼ inch (6.4 mm) rope securely attached to the device is required. It has been found that untrained individuals have a reasonable ability to reach 30 feet (9.1 m) with a rescue throw device. A 50 foot (15.2 m) rope would accommodate that distance. The 1.5 times the width of the pool allows for a safety factor to overthrow the device and pull the rope back toward the person in distress. This also allows for extra rope to hold on to. The device must be kept ready for use, and the rope must be coiled to prevent tangles and to facilitate throwing the device.

5.8.5.4.2 Reaching Pole LG

The pole is intended to reach out to a swimmer in distress and to allow them to grab hold of the pole. The pole should be submerged when introducing it to the swimmer to prevent injury. In some cases the “hook” can be used to encircle a non-responsive swimmer to draw them to the side. Use of the device involves reaching out to the swimmer and then pulling the pole straight back to the side, along with the swimmer. The pole cannot be swung around to the side as the strength required exceeds that of most people, and the pole is not that durable.

Since the pole is pulled back to the side, a telescoping pole is not appropriate as it can pull apart. Ideally the pole can reach to the middle of many smaller pools making the entire pool reachable from the side with the pole.

The pole must be equipped with a “life-hook” or “shepherd’s crook”. For safety, the hook must be a looped frame-type hook, not the single metal hook. The hook protects the swimmer from being injured by the pole, as well as allows a non-responsive swimmer to be pulled in. To prevent injury, use only the hook attachment bolts supplied by the manufacturer. This will prevent hooks and snags, caused by using the improper bolts, which can injure the swimmer.

5.8.5.4.3 CPR & RWI Prevention Posters LG

CPR performed by bystanders has been shown to improve outcomes in drowning victims.¹⁷ CPR started immediately on a drowning victim instead of waiting until emergency responders arrive will have a significant effect on the potential for brain damage in the victim. Posters of CPR explaining basic procedures can be reviewed in seconds and give the provider enough knowledge to assist the victim until emergency responders arrive.

Posters can educate patrons to recognize potential causes of, prevention, and spread of RWIs. Patrons need to be educated to what RWIs are, how they are spread, and how they can be prevented.

¹⁷ Kyriacou DN, et al. Effect of immediate resuscitation on children with submersion injury. *Pediatrics*. 1994;94 (2):137-142.

Resources for RWI education can be found at <http://www.cdc.gov/healthyswimming>. There are many resources for CPR posters that can be found online.

5.8.5.4.4 Imminent Hazard Sign LG

A sign indicating reasons requiring closure especially at AQUATIC FACILITIES where a QUALIFIED OPERATOR or QUALIFIED LIFEGUARD is not present should be posted listing specific incidents which would require the AQUATIC FACILITY to immediately close. Examples of such incidents include fecal incidents, broken/missing drain grates, water clarity, and lightning. A contact number should be provided to notify the owner/operator of conditions considered an imminent health hazard.

5.8.5.4.5 Sign for Conditions When Qualified Lifeguard is Required LG

MAHC 6.3.1.1.4 of the code outlines the conditions that require a QUALIFIED LIFEGUARD. For facilities that do not have lifeguards, patrons should be informed that no lifeguard is provided so they can comply with any requirements and understand the identified risk. For instance, at a hotel pool that requires key entry, the sign would notify hotel guests that no lifeguard is provided and persons under the age of 14 are not allowed in without adult supervision.

Model Aquatic Health Code

Lifeguarding and Bather Supervision Module

6.0 Policies and Management Annex

6.0 Policies and Management

6.1 Operator Training

6.2 Lifeguard Training

This portion of the Model Aquatic Health Code deals directly with providing QUALIFIED LIFEGUARDS in an AQUATIC FACILITY to first, reduce the risk that could lead to injury and, secondly, appropriately respond to incidents when they happen. The duties of an AQUATIC FACILITY lifeguard have been compared to a number of other occupations including comparing the role of the police officer to that of a lifeguard at a swimming pool.¹⁸ “The majority of the time, the task is very sedentary, sitting and watching. A quadriplegic could do it; until someone needs rescuing. Then the quadriplegic could not perform the required functions. It does not often happen to a lifeguard that someone needs rescuing, perhaps 0.1 per cent of the time. But the ability to jump into the water and save the drowning victim is critical to the job. This is the reason why there has been someone sitting and watching for the other 99.9 per cent of the time.” Bonneau and Brown’s¹⁹ position is that, because the disabled lifeguard is unable to perform the critical and essential part of the job, he is incapable of doing the job of lifeguard. Even if he can do 99.9 per cent of the job, he should not be employed as a lifeguard. The perception of the public is that all lifeguards can perform all that is critical and essential to their job set. Unfortunately this has sometimes been proven to be false.

Many drowning deaths resulted from omissions of basic safety precautions^{20,21,22,23,24,25,26,27}. These include absent or inadequate pool fencing, unattended young children at water sites, faulty pool design resulting in victims becoming trapped below the surface of the water, poor pool maintenance resulting in murky or cloudy water that obscured sight of submerged bodies, lifeguards being

¹⁸ Trottier A et al. Police health: a physician's guide for the assessment of police officers: 1994. Ottawa, Canada: Canadian Communication Group, 1993.

¹⁹ Bonneau J et al. Physical ability, fitness and police work. J Clin Forensic Med. 1995;2(3):157-64.

²⁰ Modell JH. Prevention of needless deaths from drowning. South Med J. 2010 Jul;103(7):650-3.

²¹ Pelletier AR et al. Fatalities in swimming pools with lifeguards: USA, 2000-2008. Inj Prev. 2011 Aug;17(4):250-3.

²² Quan L et al. Ten-year study of pediatric drownings and near-drownings in King County, Washington: lessons in injury prevention. Pediatrics. 1989 Jun;83(6):1035-40.

²³ Layon AJ et al. Drowning: Update 2009. Anesthesiology. 2009 Jun;110(6):1390-401.

²⁴ Browne ML et al. Unintentional drownings among New York State residents, 1988-1994. Public Health Rep. 2003 Sep-Oct;118(5):448-58.

²⁵ Saluja G et al. Swimming pool drownings among US residents aged 5-24 years: understanding racial/ethnic disparities. Am J Public Health. 2006 Apr;96(4):728-33.

²⁶ Thompson DC et al. Pool fencing for preventing drowning in children. Cochrane Database Syst Rev. 2000;(2):CD001047.

²⁷ Nichter MA et al. Profile of drowning victims in a coastal community. J Fla Med Assoc. 1989 Feb;76(2):253-6.

distracted by socializing with others and doing other chores such as manning admission booths and doing housekeeping chores while on lifeguard duty, and poorly trained lifeguards who did not recognize a person in trouble in the water or had not been properly trained in rescue and resuscitation techniques. In some cases, these are correctable issues that could prevent drowning deaths. We anticipate that if pool and water safety standards are strictly enforced, and as lifeguards continue to become better trained and adhere to important basic principles of surveillance, rescue, and resuscitation, the death rate in public aquatic facilities should decline. The goal of this section is to give pool owners and operators best practice guidelines for guarded and unguarded pools as tools to make AQUATIC FACILITIES safer for the general public.

6.2.1 Lifeguard Qualifications and Certification LG

Every day, about ten people die from unintentional drowning²⁸. Of these, two are children aged 14 or younger. Drowning is the fifth leading cause of unintentional injury death for people of all ages, and the second leading cause of death for children ages 1 to 14 years²⁹. From 2005-2009, there were on average 3,533 fatal unintentional drownings (non-boating related) in the United States per year and more than one in five people who die from drowning are children 14 and younger³⁰. More than 50% of drowning victims treated in emergency departments require hospitalization or transfer for higher levels of care (compared to a hospitalization rate of 6% for all unintentional injuries)^{31,32}.

Nonfatal drowning can cause brain damage that may result in long-term disabilities including memory problems, learning disabilities, and permanent loss of basic functioning (e.g., permanent vegetative state).^{33,34} Appropriately trained lifeguards are one way to reduce this risk at public aquatic venues.

6.2.1.1 Course Content LG

This section defines a broad scope of lifeguard training which is further described in the section below. These topics are universally found in all currently recognized national lifeguard training programs

²⁸ Centers for Disease Control and Prevention. Drowning 2005-2009. MMWR Morb Mortal Wkly Rep. 2012 May 18;61(19):344-7.

²⁹ Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. Web-based Injury Statistics Query and Reporting System (WISQARS) [online]. [cited 2012 May 3]. Available from: URL: <http://www.cdc.gov/injury/wisqars>.

³⁰ Centers for Disease Control and Prevention. Drowning 2005-2009. MMWR Morb Mortal Wkly Rep. 2012 May 18;61(19):344-7.

³¹ Centers for Disease Control and Prevention. Drowning 2005-2009. MMWR Morb Mortal Wkly Rep. 2012 May 18;61(19):344-7.

³² Centers for Disease Control and Prevention. Web-based Injury Statistics Query and Reporting System (WISQARS) [online]. [cited 2012 May 3]. Available from: URL: <http://www.cdc.gov/injury/wisqars>.

³³ Cummings P et al. Trends in unintentional drowning: The role of alcohol and medical care. JAMA, 1999;281(23):2198-2202.

³⁴ Spack L et al. Failure of aggressive therapy to alter outcomes in pediatric near-drowning. Pediatric Emergency Care 1997;13(2):98-102.

6.2.1.1.1 Hazard Identification and Injury Prevention LG

Lifeguards have an obligation to know and understand common hazards associated with AQUATIC VENUES, and how they may be mitigated or prevented. A vital component of this obligation is to provide patron surveillance, commonly referred to as scanning. In order to prevent injuries, a lifeguard must be taught how to recognize various swimmer conditions that need intervention such as "active," "passive", and "distressed", and to use scanning strategies and techniques to be able to see and identify the emergency. This instruction is incomplete without also teaching lifeguards how to identify factors and circumstances which cause victim recognition to become impeded such as overcrowding, cloudiness of the water, glare, or obstacles on the deck or in the water such as slides, inner tubes, or structures.

6.2.1.1.2 Emergency Response Skill Set LG

Lifeguards should have a clear understanding of the responsibilities and actions of not only the physical skills, but the cognitive and decision making skills involved in an emergency response. Training agencies should develop appropriate skills to address the variety of water depths in which a victim may be found. These skills should be trained not only for the technical aspects of the skill, but also how the skill is incorporated into a venue's Emergency Action Plan. Lifeguards should be trained to respond within the scope of, at minimum, Basic First Aid skills to provide care for illness or injury that may occur on land within the aquatic facility until EMS arrives.

6.2.1.1.3 CPR Skills LG

Lifeguards should be competent in CPR/AED at the professional rescuer level. The predominant body for the research of such skills is the International Liaison Commission on Resuscitation (ILCOR; www.ilcor.org). ILCOR currently reviews available research every 5 years and is composed of physicians and medical researchers from across the globe. One organization from each country/region of the world is assigned to interpret the science-based evidence and prepare guidelines for voluntary use by training agencies in that country/region. In the United States, this designated agency is the American Heart Association. The AHA collaborates with host groups, training agencies, as well as leaders in the field from nonprofit, educational and commercial organizations to create the "Guidelines for CPR and ECC".³⁵ These recommendations are also commonly known as "AHA Guidelines". Emergency Cardiovascular Care Update (ECCU; www.citizencpr.org) conferences are held biennially to present research and recommendations for guidelines. Detailed Information about the process and current research is available on the ILCOR and ECCU websites.

6.2.1.1.4 First Aid LG

The evidence-based application of first aid skills is currently reviewed through the National First Aid Science Advisory Board and recommendations published as a separate section of the AHA CPR and ECC Guidelines and are available at the website identified in 6.2.1.1.3.

³⁵ American Heart Association Guidelines available at :
http://www.heart.org/HEARTORG/CPRAndECC/Science/Guidelines_UCM_303151_SubHomePage.jsp/

6.2.1.1.5 Legal Issues LG

Lifeguards are part of the pre-hospital chain of response and should have basic understandings of critical legal concepts such as consent, refusal of care and negligence. Legal topics to be covered are not limited to these listed topics. Training agencies are strongly recommended to add topics based on the typical environment in which the trained lifeguard will be employed.

6.2.1.2 Lifeguard Training Delivery LG**6.2.1.2.1 Standardized and Categorized LG**

A standardized method of training with comprehensive materials is essential to the implementation of a consistently-delivered lifeguard training program.

A specific method is not being recommended by this Code.

6.2.1.2.2 Skills Practice LG

While much of the necessary cognitive knowledge may be obtained through self-directed study, especially in an interactive online format, physical skills practice is necessary to develop an understanding of how to apply knowledge and identify the various needs in an emergency situation. During skills practice an instructor can provide individualized learning approaches, corrective feedback, and lead simulations and scenarios.

6.2.1.2.3 Shallow Water Training LG

It is important that the student lifeguard be able to practice and be tested in the deepest water specified in their certification.

6.2.1.2.4 Deep Water Training LG

It is important that the student lifeguard be able to practice and be tested in at least the minimum water depth specified in their certification

6.2.1.2.5 Sufficient Time LG

This Code does not prescribe a particular length of time for courses. Instead, this Code is more performance based by requiring that all of the essential topics in MAHC 6.2.1.2 are covered by the training agency. National lifeguard training courses currently range from approximately 12 to 36 hours based on the type of training received for specific venues such as waterfronts or waterparks and the AHJ approval. Numerous factors make a uniform course length difficult to specify. Pre-existing knowledge, student to teacher ratio, internet-based learning formats, and course level are examples of these factors.

6.2.1.2.6 Certified Instructors LG

The instruction of a course by an individual not directly authorized by the training agency is extremely problematic and risks the quality controls established by the

training agency. This also places public safety at risk, in that the unauthorized instructor may not be fully qualified to teach the materials as intended. It also affects the training agency in that there is no direct recourse against an unauthorized, and unqualified, instructor. Lifeguard certifications, obtained from a lifeguard training course taught by an instructor who is not currently certified or authorized by the training agency to teach lifeguarding courses, will not be recognized as certified or trained by the AHJ per MAHC 6.2.1.3.

6.2.1.2.6.1 Minimum Prerequisites LG

The creation of minimum instructor prerequisites is a crucial piece to create quality and consistency for the training agency.

6.2.1.2.6.2 Completed Training LG

Although the code requires only completion of a lifeguard and lifeguard instructor training course as a prerequisite, an effective instructor understands the demands, stresses, and practical application of skills that can be gained from actual lifeguarding experience or the benefit of extensive training in an AQUATIC FACILITY environment. Instructors who lack such experiences may not fully understand the requirements and demands of a lifeguarding position and may not provide an experienced instructor's insight to students on how to apply the skills and knowledge found in the training agency curriculum.

It is necessary that lifeguard instructors have a firm understanding of the course they will be teaching. While it may be possible for an individual to pass a lifeguard instructor course without first taking a basic course, such an instructor would lack a firm understanding of the skills required by the training agency. It should be noted however, that training agencies should have the ability to create curriculum that would allow an individual from another training agency, or an individual who chooses to take an alternative to a full basic level course, to become instructors.

A Lifeguard Instructor Training Course must also provide information to the instructor candidates on how to safely and effectively conduct a course including:

- Knowledge of how to provide for the health and safety of the students. (example knowing how to disinfect manikins for use),
- Ability to maintain adequate supervision at all times during in water skills and have a lifeguard on duty.
- Knowledge of how to effectively use program materials and training equipment as listed in MAHC 6.2.1.2.7.
- Ability to supervise student skill practice and provide timely, positive and corrective feedback.
- Knowledge and ability to evaluate students as to meeting the criteria set forth by the training agency for which they are an instructor.

6.2.1.2.6.3 Instructor Renewal/Recertification Process LG

The training agency must have a process in place for renewal/recertification of instructors. The process should identify the criteria when reauthorization is required

such as an instructor must teach a certain number of lifeguard courses in a certain time period (years) and/or do in-person or on-line updates as needed (e.g., when course materials or content have been revised).

6.2.1.2.6.4 Quality Control LG

Quality instruction is crucial to the survival of a training agency and, in the case of lifeguard training, crucial to the safety and well-being of millions of swimmers every year. Training agencies must have procedures that allow for the correction, remediation and, if necessary, the revocation of instructor credentials.

6.2.1.2.7 Training Equipment LG

These pieces of equipment are required to accomplish the objectives of lifeguard training as outlined in the code. It is educationally sound to provide enough equipment based on the number of students who will be using it at the same time. Below is a listing of ratios recommended by several agencies; however, the training agency can adjust ratios based on their own delivery method.

American Heart Association

- a) Adult, child, and infant CPR training manikins, 1 manikin per 3 students per class period,
- b) CPR masks-- 1 per 3 students,
- c) Valves for CPR masks - 1 per student,
- d) AED trainers -- 1 per 3 students,
- e) Bag-valve-mask resuscitators -- 1 per 3 students, and
- f) Manikin cleaning supplies, -- as needed between students and after class

American Safety & Health Institute

Recommended student to equipment ratio: 3 to 1

American Red Cross

- a) Rescue tubes (one for every two participants),
- b) Adult and infant manikins (one of each for every two participants),
- c) Adult and pediatric bag-valve-mask resuscitators,
- d) AED training devices (one for every two participants),
- e) Adult AED training pads (one set for each training device),
- f) Pediatric AED training pads (one set for each training device),
- g) External bleeding control materials for each pair of participants,
 - Including two 3-inch roller bandages and,
 - four non-sterile dressings or gauze pads,
- h) Splinting materials for each pair of participants,
 - including four triangular bandages,
 - one 3-inch roller bandage,
 - a blanket or pillow, and
 - a rigid splint such as a magazine, cardboard, or long and short boards;
- i) Spinal immobilization materials,
- j) Backboards, each equipped with 3 straps and head immobilizers (one backboard for

every three participants is recommended); if fewer backboards are available, additional time may be required.

6.2.1.3 Competency and Certification LG

6.2.1.3.1 Proficiency LG

6.2.1.3.2 Requirements LG

The readiness of lifeguard candidates to respond to aquatic-based emergencies should be assessed thoroughly for skill mastery, knowledge, and practical application prior to being issued a certificate. In regards to a written exam, all nationally recognized training agencies currently require an 80% correct answer rate as the minimum threshold for passing.

6.2.1.3.3 Instructor Physically Present LG

The physical presence of the instructor of record assures that students are evaluated accordingly in both cognitive and physical testing. This also significantly reduces the risk of individuals becoming certified who lack the basic skills and knowledge necessary through either acts of omission caused by the substitution of another individual to provide testing, or by student fraud.

6.2.1.3.4 Certifications LG

A certification issued at the end of a lifeguard course indicates that the individual successfully met the training requirements on the day of assessment. A completion certificate does not imply future performance or suitability in all circumstances. It is the responsibility of the employer to verify skills and ongoing competency suitable for the environment in which the lifeguard will be assigned through pre-service and in-service training.

6.2.1.3.5 Number of Years LG

The United States Lifeguarding Standards Coalition (USLSC) final report³⁶, the scientific review by the American Red Cross³⁷, and the technical committee agree that lifeguarding skills need to be refreshed as often as possible. The ARC reviewed 12 peer-reviewed publications on CPR skill retention in healthcare providers (retraining intervals of 6 weeks to 24 months) and 28 papers focused on non-healthcare providers (retraining interval of 3 to 48 months).³⁸ The data from these 40 studies (all measured manikin skills, none measured patient outcomes) showed significant CPR skill degradation within the first year after training in both job categories and the majority of

³⁶ United States Lifeguard Standards Coalition. United States Lifeguard Standards: An Evidence-Based Review and Report. *Int J Aquatic Res Edu*. 2011;5(1):61-129.

³⁷ American Red Cross. ACFASP Scientific Review. CPR Skill Retention review. Accessed at <http://www.instructorscorner.org/media/resources/SAC/Reviews/CPR%20Skill%20Retention.pdf>

³⁸ American Red Cross. ACFASP Scientific Review. CPR Skill Retention review. Accessed at <http://www.instructorscorner.org/media/resources/SAC/Reviews/CPR%20Skill%20Retention.pdf>

skill degradation occurred in the first year. None of the 40 studies documented adequate skill retention after two years but several showed improved retention if a brief refresher was given at 6-12 months. As a result of this review and the low probability that lifeguards use the skill often enough in their job to retain the skill, the Technical Committee felt that the skills needed to be refreshed every year through re-certification. They did not think that the convenience of aligning the length of valid certifications for lifeguarding and first aid at 2 years overrode the strong data showing CPR skill degradation over two years that could put bather health at risk. The time periods listed in this Code are acceptable only if ongoing in-service and pre-service standards are followed.

6.2.1.3.6 Documentation LG

In order to verify compliance with MAHC 6.2.1.3.5, requiring the expiration date of the certification allows employers and the AHJ to identify that the lifeguard has a current certification.

Providing the level of training gives guidance for the employer or AHJ for suitability in specific AQUATIC VENUES. Examples of level of training include: Lifeguard, Waterpark Lifeguard, Waterfront Lifeguard, and Shallow Water Lifeguard. Such descriptions are not necessarily universal among all current training agencies.

The ability to identify the lifeguard instructor allows for higher quality control by the training agency. It also aids in the prevention of fraudulent certifications.

Clearly stating the restrictions on water depth for which the lifeguard is qualified allows the employer and the AHJ to quickly ascertain the basic abilities of the lifeguard that were assessed during training.

6.2.1.3.7 Expired Certificate LG

6.2.1.3.7.1 Challenge Program LG

A challenge course is one in which a lifeguard demonstrates the essential skills and knowledge required by the training agency. This demonstration is performed without prior review and/or instruction at the time of the challenge by the instructor. Prompting or coaching is not performed unless necessary to adequately assess skill level (i.e. “the victim is not breathing”).

6.2.1.3.7.2 Certificate Renewal LG

A renewal course can also be described as a recertification course. Review / Recertification courses are abbreviated courses designed to be used to assess that a currently certified lifeguard has the necessary skills and knowledge to perform essential competencies required of the training agency.

Although some skills and information are universal to all lifeguard training agencies, there are differences in physical skills. A lifeguard attempting to recertify through a different agency is not likely to have ample time to master these different physical skills.

This should not be confused with “crossover” type courses which are specifically designed to teach a currently certified lifeguard the different skills and information from another training agency.

6.2.2 Lifeguard Supervisor Training LG

6.2.2.1 Lifeguard Supervisor Candidate Prerequisites LG

The Technical Committee agreed that 18 and above was an adequate age level to consider a person as being mature enough for this position but there are many examples of good supervising at a younger age. This was a starting point but many other factors with regard to experience, training, management skills and others were equally or more important. For this reason, the minimum age for a lifeguard supervisor is not specified and is limited to meeting the minimum age requirement of a lifeguard and having the experience that equates to one season of lifeguarding (3 months).

The requirement of the ability to communicate in English is related to the ability to effectively activate the Emergency Action Plan and deliver instructions as well as interface with emergency services. This is similar to the requirement on airlines for emergency exit row seating.

6.2.2.2 Lifeguard Supervisor Training Elements LG

As of the writing of this Code, lifeguard supervision and management training courses are limited. In the development of this Code, the Technical Committee recognizes the importance of ongoing AQUATIC VENUE supervision with adequate training in injury prevention and response. What constitutes supervisor and management training was heavily discussed. The concept of “supervisor training” lends itself to far more than simply monitoring lifeguards and performing essential functions of the lifeguard as needed. Required skills for the supervisor include staff management skills, emergency response, decision making, knowledge of aquatic industry standards, etc. This list is obviously not comprehensive. This leads to a main concern in the development of a lifeguard supervisor course which is course content and length. Training agencies are encouraged to develop a system of training lifeguard supervisors that incorporates the critical components of supervising lifeguards and responding to incidents in an AQUATIC FACILITY as these items directly affect bather safety. This may include a variety of levels that address this information in various ways and as appropriate for the intended audience of each level course. The skills and knowledge found in this section are considered by the Technical Committee to be essential to any lifeguard supervisor training course, regardless of intended depth of scope. The course outline and requirements mirror that of the lifeguard training course requirements.

LIFEGUARD SUPERVISORS need to have knowledge beyond that of the lifeguard training program. The LIFEGUARD SUPERVISOR is responsible for keeping the lifeguard accountable for their own performance and as such should be monitoring scanning and vigilance within the zone of patron responsibility. As situations occur, the lifeguard supervisor will also need to react to reduce risk while they understand the legal

responsibilities of the job.

Due to the nature of the content in the Lifeguard Supervisor Training, it is possible for this content to be delivered in person or online utilizing various methods such as video and interactive media to establish competency.

6.2.2.3 Lifeguard Supervisor Training Delivery LG

6.2.2.3.1 Standardized and Comprehensive LG

The term standardized is meant to convey that the materials are standard, in writing, and are consistent from one course to another when delivered. This would require that providers, whether an agency or an AQUATIC FACILITY, have a standard method to deliver the course.

6.2.2.3.2 Sufficient Time LG

A course length is not specified as each training agency may have their own program that incorporates all the requirements but may also add other topics. The method used to effectively instruct is up to the training agency. Some may take more time than others. The code is not prescriptive on timing but rather on a course timeline that allows for covering the course content.

6.2.2.3.3 Certified Instructors LG

This is the same rationale as for lifeguard training.

This allows for an AQUATIC FACILITY to have its own internal lifeguard supervisor training course or use a training course through a training agency.

6.2.2.3.3.1 Minimum Prerequisites LG

This allows for experienced supervisors that may not have the physical skills to do the current lifeguard course as defined by the MAHC but still require the knowledge of lifeguarding.

The Lifeguard Supervisor instructor training course utilizes the same rationale as the Lifeguard Instructor training course.

6.2.2.3.3.2 Quality Control LG

This is the same rationale as for lifeguard training.

6.2.2.4 Competency and Certification LG

6.2.2.4.1 Lifeguard Supervisor Proficiency LG

LIFEGUARD SUPERVISOR testing could be in many forms from situational-based observations, shadowing with an experienced supervisor, or testing technical knowledge. Some LIFEGUARD SUPERVISOR skill proficiencies can be subjective so the methodology for testing is not prescribed in the code.

6.2.2.4.2 Lifeguard Supervisor Certifications LG

This uses the same rationale as for the lifeguard instructor training course found in MAHC 6.2.2.3.3.1.

6.3 Aquatic Facility Management LG

6.3.1 Facilities Requiring Lifeguards LG

There are many conditions that result in higher risk for bathers in an AQUATIC FACILITY and/or higher risk for any persons attempting to assist a bather in distress. These conditions each have their own distinct features that the Committee felt a QUALIFIED LIFEGUARD presence would reduce those risks. These requirements only apply to AQUATIC VENUES with standing water.

- 1) The 50th percentile adult is at least 64 inches (1.6 m) tall. The rationale is that the average adult bather's head would be above the static water line and they could use the AQUATIC VENUE without difficulty. If a bather were in distress, another adult bather would be able to assist with equipment or without equipment. Under these conditions assuming adults are present, the likelihood of providing assistance by untrained persons is high compared to water depths above 5 feet (1.5 m).

The Technical Committee thinks it necessary to begin working to prevent some of the deaths caused by greater water depth combined with the lack of lifeguard supervision. The hardship this could cause unguarded AQUATIC FACILITIES is recognized. As a result, the MAHC requirements still allow for existing AQUATIC FACILITIES to be unguarded if they follow the requirements outlines in the MAHC such as required signage. However, new construction of unguarded AQUATIC VENUES will require them to be less than 5 ft (1.5 m) deep.

- 2) Many standards recognize that a person who is under the age of 14 is considered to be a child and that their ability to make decisions especially when complying with rules will need adult supervision³⁹. Because the AQUATIC VENUE presents the risk of drowning at any depth and despite rules being posted, adult supervision is required for compliance with those rules.

The 50th percentile female at age 14 is 64 inches (1.6m) tall while the 50th percentile female at age 13 is less than 62 inches (1.6 m) tall. This is a critical time frame in which the 2+ inches (5.1 cm) are the difference between water over one's nose/mouth or the ability to keep the nose/mouth above the static water line.⁴⁰

³⁹ International Standards Organization. ISO/IEC Guide 50:2002. Safety Aspects --Guidelines for Child Safety. Available at http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=32941

⁴⁰ CDC. Growth chart for girls age 2-20. (2000). Accessed 2014 Feb 6 at: <http://www.cdc.gov/growthcharts/data/set1clinical/cj41c022.pdf>

The phrase "allows for unsupervised children" implies that an AQUATIC FACILITY that does not allow unsupervised children would not need a QUALIFIED LIFEGUARD. The intent for supervision of children is that parents/guardians or other similar adults responsible for the children are present at poolside with the children and the children are in sight. The critical component is how this is enforced. In some cases, the facility may have a sign posted that persons under the age of 14 are not allowed, such as a hotel pool. In these cases, mechanisms should be in place for monitoring and enforcing the rule understanding that by posting a sign, it is the responsibility of the adult supervising these persons under 14 to also comply with the rule.

- 3) The responsibilities of a QUALIFIED LIFEGUARD are different from the responsibilities of the chaperone of youth group. The monitoring of children in these environments is often more than six children to every chaperone. These responsibilities must be separated by having the presence of a QUALIFIED LIFEGUARD that is not distracted by the activities of the group and is focused on their zone of patron surveillance.

The chaperone, even if trained as a lifeguard, cannot manage both patron surveillance and the activities of individual children. If the chaperone is not trained as a lifeguard, it puts them at risk if a rescue is required.

- 4) Competitive swimming, sports, lifeguard training, exercise programs, and group swimming lessons all include multiple persons being instructed by one or more persons for a distinctly different objective. The primary focus is on the activity and not on patron surveillance. Similar to the rationale for youth groups, there is a need to separate the responsibility of the coach/instructor from that of providing dedicated patron surveillance.

Group swim lessons are an obvious reason to have a QUALIFIED LIFEGUARD as participants are not proficient at swimming, thus a higher risk for drowning. Lifeguard training, sports, exercise programs, and competitive swimming involve exertion and could result in a bather in distress. If the instructor is focused on an individual, the risk of a different person drowning unnoticed is higher than if a QUALIFIED LIFEGUARD was assigned just to patron surveillance.

- 5) Aquatic rescue throwing devices have been found to have a reasonable ability to reach 30 feet (9.14 m) in distance or less by untrained individuals. AQUATIC VENUES with distances greater than what it is reasonable for safety equipment to be used from the deck need to be supervised with QUALIFIED LIFEGUARDS.
- 6) Anywhere there is moving water there is a greater chance for a patron to be moved by the force of the water in an unwanted manner. This could include moving the patron a distance from safety, causing the patron to lose their balance and have a sudden submersion, and other disruptive problems. This is not intended to include "normal" flow from filtration system wall inlets. The Technical Committee agrees these AQUATIC VENUES need to have QUALIFIED LIFEGUARD supervision.

Waterslide catch pools have an induced current from the lift pump providing water as lubrication on the slide. This is not to be confused with dry slides that are on a pool deck and do not have water flowing down them. Some smaller slides have a small amount of water on them to lubricate the surface but generally do not have a dedicated pool to "catch" riders and do not generate a significant current.

Spray pads and spray decks without standing water are not included in this line item as they have an induced water movement but do not have standing water. There is NO QUALIFIED LIFEGUARD requirement for an AQUATIC VENUE with no standing water.

- 7) The risk of spinal injuries increases with activities involving head first entries from starting platforms and diving boards. As such, the need for QUALIFIED LIFEGUARDS to monitor behaviors and control the use of starting platforms and diving boards is important.

6.3.2 Safety Plan LG

The Technical Committee agreed that there needs to be a SAFETY PLAN that is specific to the AQUATIC FACILITY. Training agencies, ANSI/APSP - 1 and - 9 standards for public swimming pools and aquatic recreation facilities all speak to having plans written, rehearsed and reviewed. The Technical Committee agreed that there are other types of plans that detail processes that directly affect patron safety. In the code, the SAFETY PLAN is outlined to contain several patron-safety components. The SAFETY PLAN is written dependent on whether or not QUALIFIED LIFEGUARDS are present. The reader will note that the SAFETY PLAN components are different for guarded and unguarded AQUATIC FACILITIES.

The facility staffing plan is meant to identify positions in the AQUATIC FACILITY that address specific risks as well as support staff that would be present to assist in cases of emergency or provide support by monitoring performance of QUALIFIED LIFEGUARDS (for AQUATIC FACILITIES requiring them). In unguarded AQUATIC FACILITIES, this plan would include other staff in the STAFFING PLAN. Training agencies, ANSI standards for public swimming pools and AQUATIC FACILITIES all speak to having plans written, rehearsed and reviewed for emergency action.

Pre-employment testing as well as scheduled training is needed to verify that staff members are qualified for the environment. The committee agreed that ongoing in-service training programs for lifeguards, attendants, pool operators, and other aquatic personnel should be required. To address this, the definition for QUALIFIED LIFEGUARD requires ongoing in-service training. Such programs should include drills aimed at raising the awareness of AQUATIC FACILITY surveillance, victim recognition, emergency response, CPR/water drills, and simulations incorporating daily challenges. In addition, in-service training needs to be documented.

6.3.2.1 Code Compliance Staff Plan LG

In consideration of the requirements of the code as it relates to staff, the Technical Committee recognizes the need for identifying an individual or individuals to be

responsible for compliance with the code and the general operation of the AQUATIC FACILITY. For this reason, certain functions are identified and the AQUATIC FACILITY should designate persons to be responsible for each function even if multiple functions are accomplished by a single person. The AQUATIC FACILITY staffing plan is meant to identify risks and create accountability for the prevention and/or mitigation of such risks by identifying person(s) responsible for each.

Risk Management:

It is important to not only address identified risks but to designate persons who shall be responsible for conducting periodic safety inspections to be proactive about finding and mitigating risk as well as making decisions on closure for imminent hazards.

Determining who is responsible for deciding on closure of the AQUATIC FACILITY is important as it empowers the designated person but also creates a clear point-person for staff to go to for making this decision. The AHJ may be conducting periodic reviews and may have recommendations or need additional information. It would be beneficial to identify the individual or position responsible for interfacing with the AHJ to most effectively address changes or to provide background information. This makes it clear to stakeholders where to direct information or requests.

Maintenance and Repair:

Once risks are identified, it is critical to determine who is responsible for mitigating those risks. In some cases, it may be a facility maintenance person responsible for conducting repairs, but ultimately it is the responsibility of management to make sure these risks are addressed. Failure to maintain water and air quality can result in illness and it is the responsibility of the AQUATIC FACILITY to maintain proper air and water quality. In some cases, a maintenance team manages these systems and in some cases it may be a third party contractor or the QUALIFIED LIFEGUARD staff. Nonetheless it is important to determine who is responsible for these systems to minimize the risk to bathers.

Enforcing Rules and Responding to Emergencies:

It is important to identify who is responsible for rule enforcement. One may assume the QUALIFIED LIFEGUARD is the person responsible for rule enforcement, but by identifying the function here, it will make it clear that their primary role is in preventing injury.

QUALIFIED LIFEGUARDS will generally be the first responder to an incident but other support staff may be participating in the emergency action plan, whether QUALIFIED LIFEGUARDS are present or not. Identifying QUALIFIED LIFEGUARDS, LIFEGUARD SUPERVISORS, medical specialists, and management are critical pieces of an EMERGENCY ACTION PLAN and should be identified as a part of the staffing plan in any SAFETY PLAN.

Supervising Staff:

It is important to have a person designated as the person responsible for the critical safety functions of an AQUATIC FACILITY. Although each QUALIFIED LIFEGUARD is accountable for their zone, the LIFEGUARD SUPERVISOR makes sure each individual is doing what is expected and is present for responding to emergencies and taking the lead in making decisions about imminent hazards. Accountability for rotations and

breaks lies with the LIFEGUARD SUPERVISOR and should be clearly identified in the SAFETY PLAN to show the ability to comply with the code.

Training:

QUALIFIED LIFEGUARDS who cannot demonstrate proficiency in their lifeguarding skills may be a danger to the bathers and to themselves. Serious deficiencies that are not immediately corrected may cause the serious injury or death of a bather, the QUALIFIED LIFEGUARD, or other staff member. For this reason, it is important to identify who is responsible for conducting pre-service evaluations and in-service training. In both cases, it may be someone specifically trained in evaluating skills or trained in training others.

6.3.2.1.1 Zone of Patron Surveillance LG

The zones of patron surveillance are identified in the SAFETY PLAN so that all stakeholders are aware of the zones, how many QUALIFIED LIFEGUARDS are required to effectively cover all parts of the AQUATIC VENUE(S), and show that each zone can be effectively monitored by a QUALIFIED LIFEGUARD in accordance with the code.

The Technical Committee agreed that having identified zones of patron surveillance was one of the most needed components for all AQUATIC VENUES. QUALIFIED LIFEGUARDS should be able to determine their area of responsibility and be able to focus on that area. With the proper coverage, all areas of the AQUATIC VENUE needing to be covered would be assigned. The Technical Committee thought that one of the challenges in AQUATIC VENUE management is to ensure that QUALIFIED LIFEGUARDS understand the exact scope of their zone of patron surveillance. Training agencies and the ANSI standards for AQUATIC FACILITIES speak to “lifeguards understanding their responsibilities to their assigned stations.” This would include understanding what type of position (e.g., elevated, roaming) the QUALIFIED LIFEGUARD should be in for the most effective patron surveillance.

Both the ANSI/APSP-1 Public Swimming Pools and ANSI/APSP-9 standards state that the lifeguard “shall be positioned and provided equipment in order to reach the victim within 20 seconds of identification of a trauma or incident (e.g., response time).”

For the purposes of maintaining effective surveillance of a zone of patron responsibility, the zone is generally set up based on the location of the QUALIFIED LIFEGUARD and their ability to see the entire zone. In some cases, it is required the QUALIFIED LIFEGUARD roam to see the entire zone and in some cases the QUALIFIED LIFEGUARD must be elevated to see the whole zone. For this reason, the SAFETY PLAN must stipulate by what method the QUALIFIED LIFEGUARD can see the whole zone.

Additional responsibilities may include monitoring of adjacent decks or monitoring activities on a structure such as a waterslide, play element, or other AQUATIC FEATURE. As the aquatics industry has added other AQUATIC FEATURES to traditional AQUATIC VENUES, it is important to identify these additional responsibilities that may not be apparent if the zone were strictly a flat-water pool.

An AQUATIC FACILITY may have more than one AQUATIC VENUE and for each AQUATIC VENUE, may have multiple zones of patron responsibility. These zones may overlap in some areas and it is important to show there are not unassigned areas. The Code does not speak to a time standard for identification of an incident versus the response time, as there are too many variables in the circumstances leading to an incident.

6.3.2.1.2 Rotation Procedures LG

Studies have documented the effect of critical and non-critical signals on maintaining vigilance in tasks; these may be useful in understanding lifeguarding duties. Jerison and Pickett demonstrated that a high number of critical signals could be processed by the lifeguard for up to 60 minutes with tolerable effects on vigilance.⁴¹ However, the study found that low numbers of critical signals indicated that detrimental effects on vigilance occurred after only 20 minutes. This study also referenced the Mackworth Clock Test, commissioned in 1950 by the British Royal Navy, which found that optimal vigilance cannot be maintained for more than 30 minutes.⁴² Researcher N.H. Mackworth developed the visual sensitivity loss model. Using classic clock-task experiments, signal detection performance often declined during the first half hour of the watch. Later experiments found five- to 10-minute breaks reset the vigilance level to its original point.⁴³

The SAFETY PLAN should specify how breaks will be instituted into the rotation plan without reducing the number of QUALIFIED LIFEGUARDS on patron surveillance.

For single QUALIFIED LIFEGUARD AQUATIC FACILITIES, the plan needs to address procedures for keeping patrons out of the water while the QUALIFIED LIFEGUARD is on break or performing other alternation of task activities. Other AQUATIC FACILITY staff may need to be at poolside to ensure that patrons stay out of the water, unless all patrons leave the AQUATIC VENUE and it is appropriately secured against entry. The "off-duty" QUALIFIED LIFEGUARD cannot be responsible for this activity as it does not meet the intent, which is to accomplish a reset of the vigilance level.

Having a sound lifeguard rotation plan and procedures is crucial to the ability of the QUALIFIED LIFEGUARDS to be effective in patron surveillance. During the rotation of QUALIFIED LIFEGUARDS there can potentially be a lapse of patron surveillance if not done correctly. Because of this, the rotation system must be practiced and evaluated as to eliminate or minimize the lapse of patron surveillance time.

⁴¹ Jerison HJ, Pickett RM. Vigilance: The Importance of the Elicited Observing Rate. *Science*. 1964;143(3609):970-1.

⁴² Mackworth NH. Researches in the measurement of human performance. MRC spec. Report 268 HMSO, 1950.

⁴³ Lichstein KL, Riedel BW, Richman SL. The Mackworth Clock Test: a computerized version. *J Psychol*. 2000 Mar;134(2):153-61.

Heat, humidity, and high bather loads are stresses for QUALIFIED LIFEGUARDS, which may warrant more frequent breaks.

6.3.2.2 Emergency Action Plan LG

The Committee agreed that there needs to be an emergency closure policy that is retained and available for review by the AHJ.

Training agencies educate lifeguards to expect a written EMERGENCY ACTION PLAN created by the AQUATIC FACILITY where they will work that addresses the reasonably foreseeable emergencies that could occur.

There is a need to identify how emergencies are communicated within the AQUATIC FACILITY and external to the AQUATIC FACILITY. The types of emergencies that could occur in AQUATIC FACILITIES include but are not limited to: chemical spills, submersion events/drowning, fire, violent acts, lost children, contamination (fecal incidents and water clarity), and inclement weather.

AQUATIC FACILITY staff will likely be the persons to observe any imminent hazards and should be empowered to close pools or other areas of the AQUATIC FACILITY should those hazards be present. In particular, fecal incidents, water clarity, and inclement weather may be encountered more often and the AQUATIC FACILITY staff should know procedures for dealing with those imminent hazards and their authority to close the AQUATIC FACILITY.

6.3.2.2.1 Coordination of Response LG

The EMERGENCY ACTION PLAN identifies the individuals available and expected to respond. The goal of an EAP for a life-threatening emergency should be to activate EMS and provide for other individuals to assist the qualified lifeguard with the actions identified in the EAP (such as CPR if needed) as soon as possible. Performing effective compressions is difficult to maintain for more than a few minutes, and the presence of at least one person to take over compressions creates a cycle of rest.

In AQUATIC FACILITIES where there are multiple QUALIFIED LIFEGUARDS and/or other staff persons such as desk or maintenance personnel who are always closely available when the AQUATIC FACILITY is open, it is feasible for many persons who are trained in CPR/AED and first aid to respond within 3 minutes. Having a person who is CPR trained that can respond within minutes greatly improves survivability.⁴⁴

At a single QUALIFIED LIFEGUARD AQUATIC FACILITY, the SAFETY PLAN should identify the options for obtaining assistance, which is likely to include use of bystanders. If bystanders are part of the EAP, pre-service and in-service training should include how to direct bystanders in an emergency.

⁴⁴ Ritter G et al. The effect of bystander CPR on survival of out-of-hospital cardiac arrest victims. Am Heart J. 1985 Nov;110(5):932-7.

6.3.2.3 Pre-Service Requirements LG

6.3.2.3.1 Safety Team EAP Training LG

The Technical Committee agreed that there needs to be an SAFETY PLAN that is specific to each AQUATIC VENUE. Training agencies, ANSI standards for public swimming pools and AQUATIC FACILITIES all speak to having plans written, rehearsed and reviewed for emergency action.

It is imperative that EMERGENCY ACTION PLAN training take place before the staff begins their work as an emergency can happen at any time.

Providing a copy or posting a copy to staff ensures staff has access to the information at any time.

6.3.2.3.2 Safety Team Skills Proficiency LG

Responding to emergencies may require more specific skills and physical abilities, which once learned, must be maintained as emergencies can occur at any time. This demonstration of skill and/or knowledge verifies the staff person is ready to fulfill their role.

6.3.2.3.3 Lifeguard EAP Training LG

The QUALIFIED OPERATOR is required to prepare the SAFETY PLAN as a set of policies for the AQUATIC FACILITY. It is imperative that the employees be aware of their responsibilities and have access to the information at all times the AQUATIC FACILITY is open so they may refresh their memory or seek further information. Training during pre-service will allow the QUALIFIED LIFEGUARD to become trained in the SAFETY PLAN of the AQUATIC FACILITY.

6.3.2.3.4 Lifeguard Skills Proficiency LG

It is imperative that all lifeguards hired are currently able to perform effectively in the workplace. AQUATIC FACILITIES need to assess the lifeguard's ability to perform the job skills necessary to be a qualified lifeguard at the AQUATIC FACILITY including at any AQUATIC VENUES within the AQUATIC FACILITY where the lifeguard may be assigned before allowing the lifeguard to be on duty.

When first hired, lifeguarding skills should be assessed during pre-service training prior to the first duty assignment. In-service training should assess skills on a regular basis to determine ability for ongoing duty assignments. Training agencies require that employees have training, knowledge and the proper equipment to protect the employee and the patron against disease transmission. This level of awareness must be in place before active patron surveillance takes place.

All lifeguard training agencies require lifeguards to be able to perform a combined rescue skill with equipment to receive completion certification. All lifeguard training agencies train their lifeguards that they must be able and ready to recognize, respond,

rescue, and resuscitate a victim as quickly as possible. The employer should verify that the lifeguard maintains these skills in the workplace.

6.3.2.3.5 CPR/AED and First Aid Certificate LG

6.3.2.3.6 Documentation of Pre-Service Training LG

Documentation provides a method for the AHJ to verify compliance. An example of the type of documentation required is a skills check-off form with a participant attendance sheet.

6.3.2.4 In-Service Training LG

6.3.2.4.1 Documentation of In-Service Training LG

All lifeguard training agencies support the need for ongoing in-service training. Both ANSI/APSP -1 and -9 state that certain topics be covered in this training. These in-service trainings should include all the SAFETY PLANS and in and out of water rescue skills for lifeguards. Documentation is crucial to prove that the in-service training took place, identifies the topics covered, documents who was in attendance, and the date and time of the training.

The United States Lifeguarding Standards Coalition final report⁴⁵, the scientific review by the American Red Cross⁴⁶ and the Technical Committee agree that lifeguarding skills need to be refreshed as often as possible. The Texas state pool code requires at least 4 hours of in-service a month. Other states require that in-service training be documented and signed. The Committee agrees that all AQUATIC FACILITIES should have an ongoing in-service program for their SAFETY TEAM members.

The term “periodic” is to offer flexibility to the QUALIFIED OPERATOR based on their seasonality, staff scheduling, and the training agency requirements.

6.3.2.4.2 In-Service Documentation LG

Documentation is maintained at the AQUATIC FACILITY to provide a method for the AHJ to verify compliance during an inspection.

6.3.2.4.3 In-Service Training LG

Requiring QUALIFIED LIFEGUARDS to have the ability to respond to a victim and complete a rescue is critical. To not specify this requirement would allow a QUALIFIED LIFEGUARD to demonstrate the individual skills but not necessarily have the ability to do all the skills in consecutive order to complete the whole rescue.

Physical fitness is a critical part of performance when conducting a rescue. QUALIFIED

⁴⁵ United States Lifeguard Standards Coalition. United States Lifeguard Standards: An Evidence-Based Review and Report. Int J Aquatic Res Edu. 2011;5(1):61-129.

⁴⁶ American Red Cross. CPR Retention review. Accessed at <http://www.instructorcorner.org/media/resources/SAC/Reviews/CPR%20Skill%20Retention.pdf>

LIFEGUARDS who are newly certified must maintain their physical fitness and skill proficiency throughout the term of their certificate as those skills can be called upon at any time. The required level of physical fitness can be determined by several means.

Schultz and colleagues showed that in order to do CPR at 80 compressions a minute (training now requires 100 compressions a minute) over a 10 minute period of time the METS (metabolic equivalents) required to perform this task was 4.6 ± 0.7 ⁴⁷. One would expect this number to increase using the current protocol for CPR. The following logic and calculations was developed by Dr. Timothy Lightfoot⁴⁸ using METS values for a variety of activities that lifeguards might be expected to perform.^{49,50,51} If someone swims 500 yards (457 m) in 10 minutes, they exert 8 METs/min (so, almost double the CPR cost discussed above); Similar levels of exertion are given by:

- Running at 5 mph on a level grade (running 1 mile in 12 min or 0.8 mile in 10 minutes)
- Riding a bicycle at 14 mph on level grade (riding 2.3 miles in 10 minutes)

If the metabolic cost of doing CPR is about 4.75 METS, then lifeguards that are able to do the above tasks, should be able to do CPR almost indefinitely BECAUSE (and this is important), the metabolic cost of doing CPR is only 60% of the cost of the above exercise. Importantly, this means that when doing CPR, the metabolic cost is not so intense that they will be doing effort that will increase the amount of lactate in their blood (i.e. they won't go above lactate threshold) and if they stay below lactate threshold (60-65% max intensity) they should be able to do CPR a long time.

The United States national average response time for a BLS ambulance is 10 minutes. Paramedics are 12-15 minutes. For this reason, QUALIFIED LIFEGUARDS should be fit enough to do the rescue and do CPR for at least this for this time frame.

6.3.2.5 AHJ Authority to Approve Safety Plan LG

Some jurisdictions will have the resources to review the SAFETY PLAN and others may not. These line items allow for that flexibility but as a matter of enforcement, the submittal of the SAFETY PLAN is required in either scenario. Should an incident occur in which the jurisdiction is investigating, the SAFETY PLAN on file would be a good point of reference. The Technical Committee agreed that there needs to be an SAFETY PLAN that

⁴⁷ Shultz JJ, et al. Comparison of exertion required to perform standard and active compression-decompression cardiopulmonary resuscitation. Resuscitation. 1995 Feb;29(1):23-31.

⁴⁸ Dept. of Health and Kinesiology. Texas A&M University. College Station, TX 77845-4243.

⁴⁹ Ainsworth BE et al. 2011 Compendium of Physical Activities: a second update of codes and MET values. Med Sci Sports Exerc. 2011 Aug;43(8):1575-81.

⁵⁰ Dafoe WA. Appendix: table of energy requirements for activities of daily living, household tasks, recreational activities, and vocational activities. In: Pashkow FJ, Dafoe WA, editors. Clinical cardiac rehabilitation: a cardiologist's guide. Baltimore, MD: Williams and Wilkins, 1993; 359-376.

⁵¹ Jetté M et al. Metabolic equivalents (METS) in exercise testing, exercise prescription, and evaluation of functional capacity. Clin Cardiol. 1990 Aug;13(8):555-65.

is retained and available for review by the AHJ as a point of reference detailing the intended operation to compare to the operation observed in the field.

6.3.2.5.1 Safety Plan on File LG

The SAFETY PLAN itself should be a tool for facility staff to utilize and as such should be present at the AQUATIC FACILITY and not merely a book sitting on a shelf in an administrative office.

6.3.2.5.2 Subject for Review LG

The code is written to be performance-based and since each AQUATIC FACILITY is different, each SAFETY PLAN may be different. The SAFETY PLAN is developed to be a written document that establishes the processes the AQUATIC FACILITY will employ to be compliant with the code. It is important to also put in the code that those processes, although written, are also practiced and in evidence for the AHJ to see and compare the operation to what is written in the SAFETY PLAN and therefore compliant with the code. During routine inspections, the AHJ may want to see the SAFETY PLAN for the AQUATIC FACILITY as a point of reference but also to enforce a requirement of the code to have a plan.

6.3.3 Staff Management LG

6.3.3.1 Staff Provided Prior to Venue Use LG

6.3.3.2 Safety Team Responsibilities LG

6.3.3.3 Lifeguard Staff

6.3.3.3.1 Minimum Number of Qualified Lifeguards LG

6.3.3.3.2 Lifeguard Responsibilities LG

QUALIFIED LIFEGUARDS are the front line personnel at an AQUATIC FACILITY to witness most of the situations in which an AQUATIC FACILITY or AQUATIC VENUE should be closed. The QUALIFIED LIFEGUARD must be aware of these emergency closure issues in order to enforce them – examples include an inability to see the bottom or main drains, fecal accidents, severe weather, and others developed by the MAHC.

The technical Committee agreed that since there is no established guideline for vision needed for the job of a QUALIFIED LIFEGUARD that if the individual QUALIFIED LIFEGUARD has corrected vision via lenses that they should wear them while conducting patron surveillance. Further research needs to be done in this area. Some professions require a minimum vision standard non-corrected while others accept corrected vision to a certain level.

6.3.3.3.3 Shallow Water Certified Lifeguards LG

If a training agency issues a shallow water certification, the shallow water lifeguard is not qualified to be stationed in a zone that has water greater than that identified for the

certification. If any part of the zone has a depth of water greater than that depth, the shallow water lifeguard is not qualified to be assigned to that zone.

6.3.3.3.4 Direct Surveillance LG

The factors of recognition, intrusion, and distraction have been identified as major contributor to drowning in guarded venues. Nothing should be allowed to interfere with a lifeguard's duty to perform patron surveillance. The Technical Committee all agreed that QUALIFIED LIFEGUARDS performing patron surveillance should not be doing other tasks that could distract them.

When on duty, a QUALIFIED LIFEGUARD should scan and supervise the AQUATIC VENUE with no other distracting activities such as cleaning, water testing, and minimize unnecessary conversing with patrons.

6.3.3.3.5 Distractions LG

When QUALIFIED LIFEGUARDS are engaged in conversations while performing patron surveillance activities their attention is distracted from surveillance. As a parallel, research has shown that even hands-free cell phone conversations can cause drivers to be distracted.⁵²

6.3.3.4 Supervisor Staff LG

6.3.3.4.1 Lifeguard Supervisor Required LG

The LIFEGUARD SUPERVISOR fulfills the role of making QUALIFIED LIFEGUARDS accountable for performing well and make sure the rotations are conducted properly. It is critical that QUALIFIED LIFEGUARDS perform their duties as trained and that the risk factors that affect the QUALIFIED LIFEGUARD'S ability to perform have been mitigated. In addition, someone should be responsible for maintaining equipment and knowing when an AQUATIC FACILITY should close and should know how to mitigate hazards. This level of skill is different from that of the QUALIFIED LIFEGUARD and each of these skills is important to have on-site anytime the AQUATIC FACILITY is open.

The Technical Committee considered requiring a LIFEGUARD SUPERVISOR for all AQUATIC FACILITIES, but for a single guard facility, there is no requirement as a QUALIFIED LIFEGUARD doubling as a supervisor would be a redundancy. The SAFETY PLAN should address the means of providing oversight and direction to lifeguards at single guard facilities.

6.3.3.4.2 Designated Supervisor LG

For any AQUATIC FACILITY, someone must be designated to make decisions and provide oversight of expected performance. When an AQUATIC FACILITY is required to have two or more QUALIFIED LIFEGUARDS, one of the QUALIFIED LIFEGUARDS may be designated as the

⁵² Olson RL et al. Driver distraction in commercial operations. U.S. Department of Transportation Technical report FMCSA-RRR-09-042. September 2009. Report is accessible at <http://www.distraction.gov/research/PDF-Files/Driver-Distraction-Commercial-Vehicle-Operations.pdf>

LIFEGUARD SUPERVISOR as long as they comply with the training requirements. The qualified lifeguard cannot fulfill lifeguard supervisor duties while on scanning duty. For small aquatic venues, the Technical Committee was sensitive to requiring an additional person simply to be the LIFEGUARD SUPERVISOR. In this scenario, one of the QUALIFIED LIFEGUARDS is designated as the LIFEGUARD SUPERVISOR to make decisions when appropriate.

A Note About Resources:

The resources used in all MAHC modules come from peer-reviewed journals and government publications. No company-endorsed publications have been permitted to be used as a basis for writing code or annex materials.

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Additional Resources

- EMS World Response Time Standards:
<http://www.emsworld.com/article/10324786/ems-response-time-standards>
- Prevention of Drowning: Visual scanning the attention span in lifeguards:
<http://www.lifelink.ca/resources/ScanningArticle.pdf>
- Effective Lifeguard Rotation video – The Redwoods Group:
<http://www.youtube.com/watch?v=Gm0iGL1hWoM>
- Center for Disease Control and Prevention Fecal Incident Response Recommendations: <http://www.cdc.gov/healthywater/pdf/swimming/pools/fecal-incident-response-recommendations.pdf>