Assisted Lifeguard Technology (ALT) ING01

UK Swimming Pool Operator Guidance for Automated Monitoring and Detection systems in public lifeguarded swimming pools

To provide an additional layer of safety and support lifeguard(s) to save lives.

CIMSPA

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CONTENTS

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Assisted Lifeguard Technology (ALT) refers to any technology that assists lifeguards in swimming pool safety.
Automated Monitoring and Detection is a type of technology detailed in this guidance document.

1. INTRODUCTION AND SCOPE

This guidance has been prepared for and intended for consideration by UK Swimming Pool Operators of public lifeguarded swimming pools that have or are considering installing automated monitoring and detection system. It has been written, taking into account guidance including BS EN ISO 20380:2017; Health and Safety in Swimming Pools (HSG179) Fourth Edition published 2018.

Pools covered by this guidance: Public lifeguarded swimming pools.
Pools not covered by this guidance: Non-lifeguarded swimming pools.

An automated monitoring and detection system: The primary function of an automated monitoring and detection system is to support and alert lifeguards to promptly identify and respond to a developing emergency, and support lifeguards, allowing a blended lifeguard approach to pool supervision.

An automated monitoring and detection system does not eliminate the lifeguard function.

This guidance:
- is compatible with, and supportive of, the principle of constant pool supervision in line with established guidance and expectations; enabling operators, through risk assessment, to control the number and position of lifeguards
- is aimed at swimming pools when the pool is constantly lifeguarded
- aims to guide the performance and design elements that should be considered when installing and operating an automated system
- is not intended to cover the local operational aspects of automated systems detailed in the risk assessment
- does not cover the operation of traditional CCTV systems
- does not cover the operation of wearables and non-camera systems.

2. DEFINITIONS

2.1 Alarms – a means to alert people of an emergency - an alarm can be visual or auditory.
Health and safety in swimming pools, referred to as HSG179 (Health and safety in swimming pools - HSG179 (hse.gov.uk) paragraph 41 *"Pool halls may have a number of alarms for different types of emergencies, for example, fire, plant failure, help etc. Each alarm should be distinctive, and it may help in buildings with a public address system to have recorded messages alerting staff to a particular type of emergency. A visual beacon may be useful in some circumstances if, for example, pool users are likely to be hearing impaired, and there is no other way to alert them."*

2.2 Alert – an alert will usually be audible, vibrating, visual or a combination.

2.3 Blended Lifeguarding is a:
- **technique**
    a) combining 10:20 scanning
    b) which combines the traditional methods of pool supervision, safety and rescue with monitoring and detection systems, creating the capability to produce a safer swimming environment
- **term** used to describe the partnership between the lifeguard(s) and a monitoring and detection system in lifeguarded swimming pools
- **working practice** which harmonises the best capabilities of technology and humans to produce a safer swimming environment.

2.4 Blind Spots – areas that cannot be seen; a blind spot could be created by the design of the pool, features, plants, or anything that provides an obstruction.

Following risk assessment, which is a legal requirement under the Management of Health and Safety at Work Regulations 1999 and referenced in HSG179, a risk assessment must be undertaken to determine the level of supervision required, considering pool and pool hall features, including glare, reflections and blind spots. See HSG179 Paragraph 82 states that a risk assessment must be undertaken to determine the level of supervision required. Consider the following when carrying out your risk assessment:

- The nature of the pool (public, school, hotel, holiday park, etc.)
- Pool design (for example, layout, access from changing rooms)
- Pool water area
- Pool water depth
- Abrupt changes in water depth
- Pool and pool hall features (for example, glare, reflections, blind spots)

2.5 Observation – see paragraphs 116 to 121 in HSG179.

2.6 Glare – a very strong, bright, dazzling light which is difficult to look at. Caused by direct or reflected sun light or artificial lights.

2.7 Specular Reflection – a type of surface reflection often described as a mirror-like reflection of light onto the surface of the water.

2.8 Lifeguard Zone Visibility Test (LZVT) – is used to determine the number of lifeguards. HSG179 paragraphs 84 - 86. The LZVT is a practical exercise designed to highlight any areas of the pool surface or pool basin floor where a casualty cannot be seen from any particular lifeguard position, especially those furthest away and closest to the lifeguard position. The LZVT will allow you to confirm that: your lifeguard numbers are correct; positions are correct and give 100% visibility of the pool; positions cover the full volume of pool water and designate observation zones for each lifeguard position (see www.rlss.org.uk/hsg179).

2.9 Monitoring – close observation to monitor the pool area or part of the pool area.
HSG179 - *"Lifeguards are in the front line of pool-user education and can help prevent accidents; therefore, good communication skills are essential."* (See HSG179 Paragraph 41, 164 and 167).

2.10 Scanning – scanning is a technique used to supervise a particular zone using a sweeping action. 10:20 scanning system- The internationally recognised practice known as the 10:20 system requires lifeguards to be able to scan their supervision zone in 10 seconds and to be close enough to get to an incident within 20 seconds

3. SYSTEMS

3.1 Monitoring and Detection Systems

Systems may be made up of underwater or overhead cameras or a combination of both, cameras are coupled with computer software. When an observation is made the system will activate a visual alert and/or audible alarm and provide the location of the person which allows the lifeguard to respond.
The system may be able to provide active and constant monitoring of people in the pool.

Some systems provide real-time footage on a monitor that lifeguards can use.

This guidance refers to underwater and/or overhead cameras combined with computer software, which provides real-time footage of the swimming pool. In both cases, the system detects a person in difficulty activating a visual alert and/or audible alarm giving a location [necessary when there are blind spots or specula reflection areas] which can be responded to by a lifeguard. A swimming pool monitoring and detection system may provide active and constant monitoring of people in the pool and provides real-time information on a monitor with visual and/or audible alerts.

The system detects people in difficulty by learning what a typical pool user looks like in order to identify someone that may need assistance.

This guidance should be considered with the HSG179, paragraphs 116-122, the technology to aid observation summarised below.

3.2 System Coverage

Early dialogue between the supplier, architect and designer is essential, and the operator will support in determining the optimum location of the cameras and pool equipment.

The scope of the coverage should be agreed upon early in the design process. It is important to understand the location of specific equipment such as access steps, movable floors, bulkheads, water slides, hoists/chairs/pods etc. as they could influence the placement of cameras to allow for full underwater coverage. There are specific questions that the operator needs to address at the design stage:
- In a multi-pool complex will the system cover all pools or just one pool?
- Location of cameras, underwater and/or overhead, to ensure 100% coverage of the area the system has been designed for?
- Location and quantity of monitors, if required?
- Location of hardware for systems, if required?
- If monitors are required, will they be attached to lifeguard chairs?
- Will monitors be available to employees in another area (i.e. office, reception etc.)?

3.3 Integration with other Systems

Consideration needs to be given as to how the detection and monitoring system integrates with other systems in the building. This will include emergency alarms, including where and how the alarm sounds in the event of detection. A manual emergency pool alarm should always be provided alongside the monitoring and detection system to ensure the team backup can be alerted and will respond in the event of an emergency. Architects and designers should liaise with operators and suppliers to establish the requirement for the integration of systems.

3.4 Maintenance, Inspection and Testing

The system should be maintained to meet the manufacturer's guidance. Any testing advised by the manufacturer should be conducted by the operator and tests recorded.

3.5 Design for Maintenance

The accessibility of cameras for maintenance purposes should be considered as part of the design. Ideally, cameras should be accessible without the need for access equipment.

4. INSTALLATION

4.1 Design and Retrofitting

It is important that architects and designers are familiar with monitoring and detection systems by engaging at the earliest opportunity with clients, architects, designers, manufacturers, installers and operators when designing a pool to understand the requirements and how technology can be integrated.
It is arguably more effective, with fewer challenges to the structure of the pool, if the system is designed and built-in rather than retrofitted, especially in systems that require underwater cameras. This guidance can also be used by way of assistance in relation to retrofit installations.

4.2 Lighting Levels

Some systems may require high lighting levels to ensure the system works effectively. The Sport England Design Guidance should be followed, in line with the Swim England design guidance which is 300lux minimum. This guidance may be considered alongside guidance from Chartered Institution of Building Services Engineers (CIBSE) www.cibse.org/society-of-light-and-lighting

Systems can be negatively affected by lighting levels produced by overhead and/or underwater.

4.3 Positioning of Monitors and Lifeguard Positions

Some systems include a monitor with real-time live footage. For these systems, operators will determine how lifeguards use the monitor.

Lifeguards may use the monitor as part of their scanning pattern, use it for periodic checks and/or refer to it when the system provides an alert. Operators will need to ensure the position of the monitor is suitable to allow it to be used as intended at the particular venue.

The position of the lifeguard (or lifeguards) is a critical factor which should be determined at the design stage to ensure 100% visibility, as detailed in para 86 HSG179.

When monitors are mounted on the lifeguard chairs, and/or podiums, consider:
- the correct chair for the position used
- an ergonomically designed chair
- power and data supply to the monitor
- visibility –The screens of the monitors should not be impacted by glare and reflection from natural or artificial sources
- monitor screens to ensure ensure compliance with the Health and Safety (Display Screen Equipment) Regulations 1992
- additional weight pressure on the chair and anchoring the base.

The design should consider events that may be held in the pool, i.e., swimming competitions when lifeguard chairs may require repositioning. It may be a requirement of the automated system that lifeguard chairs be equipped with a detachable cord to allow movement of the chair for specific events.

4.4 Pool Water Quality and Tank

Some systems require exceptional water quality and a certain design of pool tank. When selecting a system, operators should understand the requirements for that particular system.

When considering the installation of a system, architects, designers, manufacturers and installers should engage with clients and operators to consider the following, but not be limited to:
- Colour of the pool tank, the surface of the pool tank, including lines or other markings
- Water quality to function effectively
- Blind spots
- Use of specialist pool equipment, e.g., movable floors, assessable steps, platforms hoists, inflatables, moveable booms
- Placement of temporary equipment such as timing pads, hoists, teaching platforms, lane dividers
- Glare and specular reflection, including natural and artificial lighting
- The dimensions and gradients of the pool tank
- The swimming (bather) load; based on filtration and surface area
- The type of pool and how it will be used
- Depth limitations (shallow and deep)

4.5 Selecting a System

It is important to review different types of systems to identify which system is best suited to the individual premises and user types. For example, some systems are not as effective in shallow and/or turbulent water or irregularly shaped pools.

Operators should understand the technical capabilities and limitations of the system. Any limitations should be accounted for in the risk assessment process and Pool Safety Operating Procedures (PSOP), with the necessary control measures put in place. For example, there may be areas of pool that the system cannot cover.

4.6 Building the Infrastructure

Ideally, installation should be considered and arranged at the design stage. Some systems require niches to be incorporated into the pool tank.

For systems that use underwater cameras, the benefit of a system installed at the build stage is the integrity of the pool tank is not later compromised, and the pool tank is not subject to protruding camera housings. Early consultation with the monitoring and detection supplier will determine the number, type, and location of niches, including the depth below the water surface.

For systems that use underwater cameras, containment will also be required, due to the swimming pool environment, to carry the Cat 6 cabling from the underwater cameras to the system hardware, with continuously sealed containment from the niches to the termination box above the water level.

5. OPERATIONS AND TRAINING

5.1 Management of Information

A recording system provides detailed evidence for an effective incident review. Consideration should be given to the operator's policies covering CCTV. Information should be kept securely, following the operator's General Data Protection Policy (GDPR). See the Data Protection Act (www.gov.uk).
This will include the storage of data by operators who should upon installation, understand the storage of data, including visual images and the process of accessing. The operator should include the system in the GDPR policy, notifying The Information Commissioner where necessary.

Due to the recording of footage, the location of the system hardware should be considered to ensure compliance with Data Protection legislation. The data rack should be in a secure cool environment with power and an internet connection where it can be accessed for review and management information.

5.2 Lifeguards using Monitoring and Detection Systems

Operators will need to establish how lifeguards will use the system they have installed, including the tools designed for lifeguards, such as watches, tablets, or monitors. These details will need to be included in the Normal Operating Procedures.

Where a system has a monitor which provides real-time live footage on a monitor, the operator should determine how lifeguards use the monitor. Lifeguards may check the monitor as part of the scanning pattern and/or use the monitor for periodic checks on a particular circumstance or individual and/or use the monitor to check when the system provides an alert.

5.3 Pool Safety Operating Procedures and Risk Assessment

The specific risk assessment, Normal Operating Procedure (NOP) and Emergency Action Plan (EAP) must all be updated to reflect the use of the system.

The NOP should include arrangements for how the system is used by lifeguards and other staff.
The EAP should include details to manage problems with the system and arrangements should the system fail, and the swimming pool is to remain operational.

Operators should have completed Lifeguard Zone Visibility Tests (LZVT) to ensure that the lifeguard(s) have 100% visibility of the pool.

5.4 Staff Training

5.4.1 Staff should receive training before using the system. Training should include:
- how the system operates
- NOP relevant to the system
- EAP relevant to the system
- testing of the system, if applicable
- how to report issues with the system
- how to respond to customer questions about rationale and data security/privacy.

5.4.2 Lifeguards should be reminded that the primary function of the system is to alert the lifeguards of a situation in the pool that may require additional intervention. The system will reinforce and support but does not replace lifeguards or lifeguards scanning.

It is important that lifeguards do not assume the system is doing their job for them.

5.4.3 In addition to the training above, lifeguards should understand:
- How to manage:
  - concerns around swimmers blocking cameras (especially for systems with underwater cameras)
  - a system failure
  - concerns about water quality.
- When and how to:
  - respond to an alert
  - review an alert
  - use the monitor, if applicable
  - cancel an alert following the review
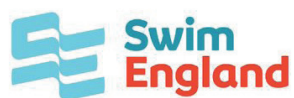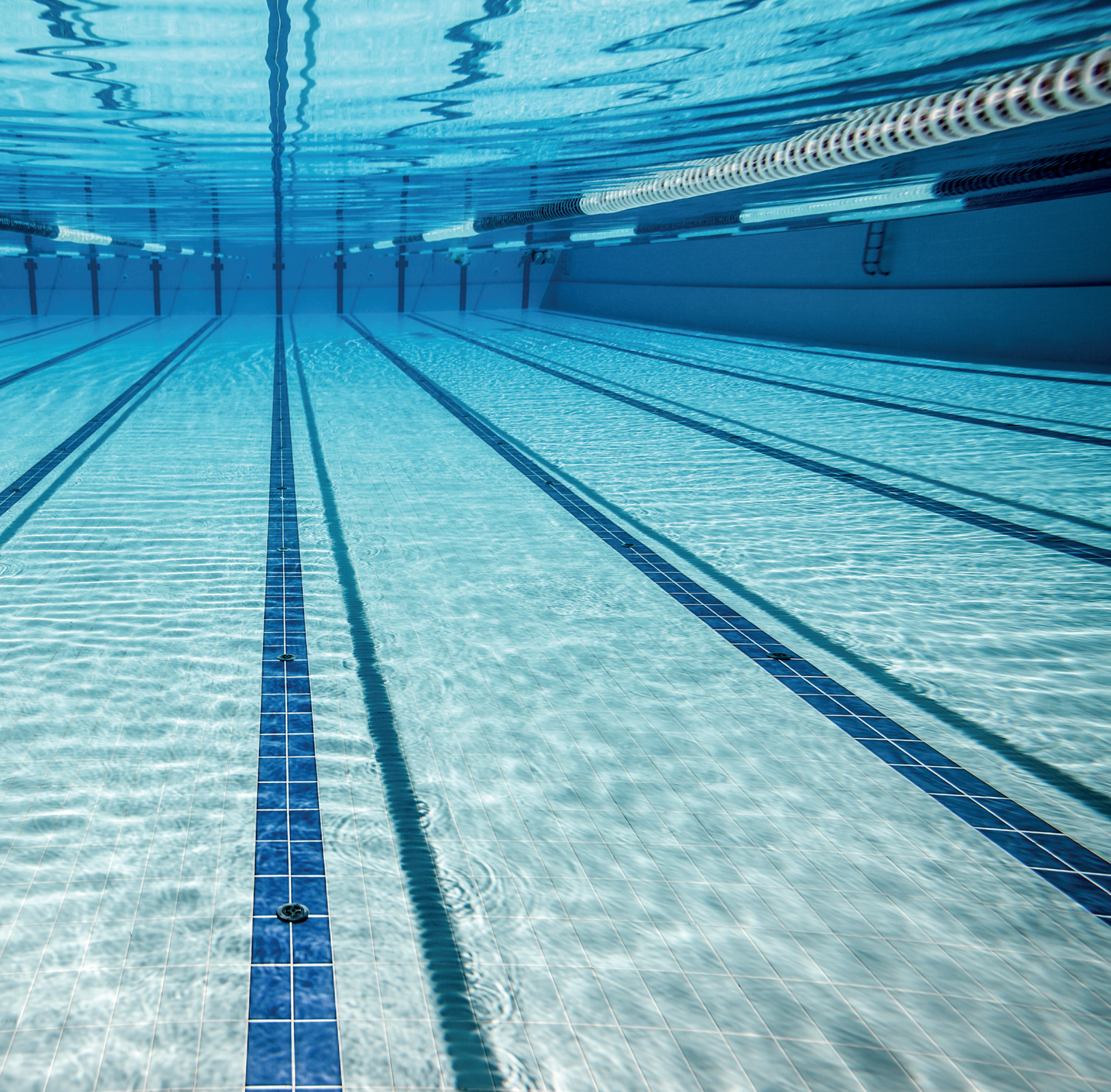 - activate the pool alarm.

Lifeguards should have the opportunity of training to practice using the system. Once the system is operational, lifeguards may monitor periodically using the system and be given the chance to provide feedback to ensure its effectiveness.

5.5 Customer Information

Consideration should be given to notifying customers prior to the installation of the system. Provision should be made for signage to inform customers that recording is taking place.

REVIEW PROCESS

This document will be formally reviewed annually (during October for publication the following January), led by the RLSS UK, who will formally consult and agree any change with CIMSPA, Swim England and ukactive. The team that reviews this document will comprise a minimum of two multi-site operators using a monitoring and surveillance system, a minimum of two independent swimming pool experts, and a representative from Swim England and the RLSS UK.