

SAFETY TRAINING FOR DIVING COACHES

Providing a Safe Physical
Environment-Facilities,
Equipment, Environmental
and Weather Conditions

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LESSON 3

❖ FACILITIES

STANDARD

- Prevent Injuries by providing safe facilities.

Context

Diving involves height and rotation in both a dryland and aquatic environment. The coach must be familiar with standards and guidelines regarding facility safety, inspection, and maintenance and continuously work to monitor and maintain full compliance.

Benchmark

- ✓ Assure that facilities and structures are installed, secured, and protected according to safety specifications and manufacturer's instructions.

POOL DESIGN

- Although there is no record in the U.S. of a catastrophic diving injury from impact with the pool bottom in a diving area that meets FINA Dimensions, these dimensions are not a fail-safe.
- There is a basic requirement to steer underwater to avoid potentially injurious impact with the bottom in any practical pool.

FINA DIMENSIONS

- FINA Dimensions for Diving Facilities (A-N) built after March 3, 1991, recommended by USA Diving, provide room to maneuver underwater for the diver to steer to avoid collisions with the pool bottom, upslope, and pool sides that could result in serious spinal cord injuries.

FINA DIMENSIONS

- The basic reference for measurement of competitive diving dimensions is the plummet, a vertical line extending through the center point of the front edge of the springboard or platform.

FINA DIMENSIONS

- To convert the minimum and preferred dimensions listed in the FINA dimensions from meters into feet: Multiply the recommended dimensions in meters by 39.37 and divide by 12.

FINA DIMENSIONS

- The water depth and upslope of the pool bottom varies in pools with deep water and diving boards. In diving facilities that conform to FINA Dimensions (JK), a minimum water depth of 3.30 meters is carried a horizontal distance ahead of the plummet on 1 meter springboard for: _____

DIMENSION RECOMMENDATIONS

- USA Diving recommends that coaches hold all practice sessions in pools which comply with the minimum depth and other dimensions.
- Diving facilities for Olympic Games and World Championships must observe the preferred measurements given in the FINA Dimensions for Diving Facilities table (*FINA Handbook 2005-2009*).

USA DIVING RECOMMENDATIONS

- The minimum depth of water at plummet necessary to receive sanctioning for a competitive event from USA Diving are 11 ft and 12 ft for 1- and 3-meter springboards respectively.

Benchmark

- ✓ Regularly inspect and monitor diving facilities to detect and reduce the risk of environmental, structural, or surface hazards on a regular basis. Document inspections and reports of problems.

FINA DIMENSIONS

- The aquatics facility manager is usually the person responsible for monitoring and maintaining the facility or spa, but these responsibilities depend on the employee's job description and pool operator certifications.

SANCTIONING COMPLIANCE

- It is the primary responsibility of the Meet Director at the competition site to determine that the facility complies with sanctioning requirements before the competition warm up begins.
- These responsibilities can be performed personally or delegated to knowledgeable officials.

WATER AND AIR QUALITY

- Diving coaches should report the following water and air quality issues to the aquatic management:
 - ✓ Cloudy water
 - ✓ Unusual water color
 - ✓ Eye irritation or severe coughing

ELECTRICAL CONCERNS

- Coaches need to be aware of the hazard that electrical shock presents when electrical connections and wires come into contact with water.

ELECTRICAL CONCERNS

- Equipment that runs on electricity should connect to a ground fault circuit (GFCI)
- Divers should not be in the pool when the pool vacuums are operating.

FECAL CONTAMINATION

- Coaches should be aware that the best defense against an outbreak of intestinal parasites that gain entry into the pool through fecal material is for pool operators to maintain a chlorine level of 1.0 to 2.0 ppm.

DOCUMENTATION

- See Inspection Checklists in Safety Manual

Benchmark

- ✓ Modify plans for practice and competition after assessing potentially unsafe conditions that may exist.

RISK OF COLLISION

Coaches may need to modify usage to avoid situations that compromise the safety of an athlete when:

- Dimensions are non-conforming
- Divers share the diving area with other aquatic programs
- The platforms are stacked
- Diving equipment is at right angles or at opposite ends of the pool

MODIFY USAGE PLANS

What makes any pool safe is how it is used. Coaches should:

- check that divers can swim well enough to practice in the deep diving area of the pool. Divers should be able to jump feet first into deep water, swim to the surface, turn around, level off and swim 10 feet to the side.
- instruct divers to enter the water feet-first the first time in the deep diving area of an unfamiliar pool.

MODIFY USAGE PLANS

Follow injury control strategies to modify usage appropriately so that facilities with non-conforming dimensions may be used by competitive divers when:

- A facility's deficiency does not materially interfere with a competition, or
- A practice, conducted in a controlled environment, is monitored so that the use of the facility does not increase the possibility of a collision in flight or in the water.

ASSUMPTION OF RISK

If a pool is non-conforming:

- All divers and coaches new to the pool should be warned about the nonconforming dimensions, particularly those that affect room to maneuver.
- Decisions to dive must be made voluntarily with full appreciation and assumption of the potential risk of serious injury, paralysis or death.

Benchmark

- ✓ Recognize the need to monitor athletes when other facilities may become attractive to use and potentially hazardous.

INSURANCE EXCLUSIONS

- Prohibit swimmers from using the pool's springboards and platforms during the diving training sessions. USA Swimming or USA Diving insurance does not cover the use of diving facilities by swimmers during a swimming or diving workout.
- Divers should NOT use the starting blocks in the swimming pool. Starting blocks are for use by competitive swimmers in controlled situations supervised by a competitive swimming coach.

INSURANCE

INSURANCE INCLUSION

- Trampolines are included in USA Diving insurance for restricted and scheduled use by USA Diving registered athletes, coaches and clubs. Use an effective barrier protection that prevents unauthorized access.

LESSON 3

❖ EQUIPMENT

STANDARD

- Ensure that all protective equipment is available, properly fitted and used appropriately.

Context

The proper selection, use and maintenance of equipment are critical to minimizing risk to athletes. Equipment must be checked on a regular basis. The coach must provide athletes with clear instructions on the care and use of protective equipment.

Benchmark

- ✓ Ensure that athletes are provided with equipment that meets recognized safety standards as required by appropriate governing agencies

SPRINGBOARD SPECS

USA Diving Rules and Regulations state that springboards are to be installed:

- dead level at the leading edge when the moveable fulcrum is in all positions
- according to manufacturer's specifications

SPRINGBOARD SPECS

USA Diving Rules and Regulations state that the:

- Front edge of the board shall project at least 5 ft, and preferably 6 ft, beyond the edge of the pool
- 3-m springboard stands shall be equipped with safe guard rails that extend at least to the pool edge and that will prevent divers from falling off the board onto the deck at the sides.

IN-GROUND SPARGER SPECS

- The in-ground sparging system should be installed and maintained in accordance with the manufacturer's specifications.

ABOVE GROUND SPARGER SPECS

Coaches should be aware that USA Diving insurance includes above ground removable sparging systems that:

- Conform to system configuration recommended by USA Diving,
- Are securely affixed to the pool bottom or adequately weighted in a manner that the system cannot be inadvertently misaligned by ordinary usage or any reasonably anticipated misuse, and
- Comply with maximum design specs recommended by USA Diving to provide an acceptable air/water mix from the 7.5- and 10-meter.

SPAS AND HOT TUBS

- In most situations the aquatics director is responsible for meeting health department codes and proper water quality of the spa.

BASIC MATS INTENDED USE

One single layer of resilient closed-cell foam (1-2.5 inch thickness).

Used for:

- Tumbling skills
- Initiate somersault takeoffs
- Used under landing mats for additional cushioning

LANDING MATS INTENDED USE

Softer shock absorbent foam sandwiched between resilient closed cell foam (3-7 inches thick).

Used for:

- Cushioning landings of various tumbling skills

SKILL CUSHIONS INTENDED USE

Softer open cell with softer landing than landing mats (8-12 inches thick).

Used for:

- New or difficult skills
- Reduce the risk of injury in an off-balanced landing

PORTABLE LANDING PIT SPECS

Portable landing pit minimum dimensions are 12' x 6' x 32" for skills done in the somersaulting and twisting belts from dryboard and platform takeoff surfaces, pit level and up to 1-m above pit level.

Used in conjunction with an overhead spotting rig for:

- Enabling a competent spotter to assist a diver in a safety belt down to the pit to the hands in an armstand landing position that simulates head-first water entry alignment of the diver with arms overhead.

Larger pits are available:

- An average forward distance is 16'-18'
- An average width is 8'-10'.
- Greater depths in the range of 36"-42"

OVERHEAD SPOTTING RIG SPECS - TRAMPOLINE

The overhead clearance required on trampoline varies according to its usage. USA Diving recommends:

- The spotting rig centered over tramp with the spotter operating the ropes from the double pulley side.
- The frame of the spotting rig should provide at least a minimum of 17 feet to a preferred 21 feet floor to pulley overhead clearance.

OVERHEAD SPOTTING RIG SPECS - TRAMPOLINE

- USA Diving's recommendations for floor to pulley clearance of overhead spotting rigs on trampoline are predicated on the sport specific use of the trampoline as single contact activities, priming the bed, step in hurdle, low bounces, and standing back take-offs.
- An overhead clearance of 24 feet on trampoline is recommended by the American Society for Testing and Materials (ASTM) for trampoline used by consumers in home environments for the purpose of continuous vertical jumping activities and the international governing body for trampoline (FIG) used for competitive trampoline routines.

OVERHEAD SPOTTING RIG SPECS - DRYBOARD AND DRY PLATFORM

USA Diving recommendations for dryboard or platform include:

- A minimum 17' to a preferred 21' overhead clearance, with pulleys placed 2.5'-3.0' ahead of the board or platform, and
- Rope angles at 35 degrees to insure freedom of motion.

OVERHEAD SPOTTING RIG - WETBOARD

- On wetboard, provision should be made for an extra ten feet of rope so that when the rope is released for entry, it will not be pulled through the overhead pulleys.

SPOTTING BELTS SPECS

Coaches should be aware that:

- Somersaulting and twisting belts are purchased by the diver's waist size.

Benchmark

- ✓ Monitor fitting and maintenance of all equipment for athletes.

DURAFLEX NON-SKID MAINTENANCE

Maintenance requirements established by Duraflex include:

- The surface of the board must be tested and found to be sufficiently “non-skid” **WHILE THE SURFACE IS WET** by the pool manager when the board is put into use each season.
- The pool manager must instruct the lifeguards (or other supervisors) to test the surface **WHILE WET** each day at the start of their shift of duty.

DURAFLEX NON-SKID MAINTENANCE

Maintenance methods for Duraflex springboards include:

- Hose off the board when you wash the pool deck (more than once week)
- Scrub with detergent or chlorine and very hot water, monthly or when needed. Use a plastic or fiber-bristle brush.
- Muriatic acid may be used to remove algae or stains

DURAFLEX NON-SKID MAINTENANCE

Maintenance for a worn-out surface on the competitive Duraflex springboard:

- Take the board out of service if it is slippery and contact the factory for refinishing.

SPARGING SYSTEM MAINTENANCE

In- and above-ground sparging systems are pressure vessels and as such require the expertise of a licensed pneumatic specialist as these vessels can explode just as a scuba tank can when filled with compressed air.

SPARGING SYSTEM MAINTENANCE

- The safety inspection of the pneumatic equipment – including the compressors, valves, gauges and pressure vessels- must be carried out according to the most stringent of the schedules laid out by the manufacturer, national electrical and plumbing codes, municipality, state or other regulating bodies.

SPARGING SYSTEM MAINTENANCE

- Unqualified personnel might replace fittings with undersized inside diameters reducing the effectiveness of the system without the coach's knowledge.
- A good check on the repair is to note that there should be no apparent reduction in the mound size when the bubbler is activated.

ABOVE GROUND SPARGER MAINTENANCE

Maintenance checks include:

- Check for cracked or broken PVC.
- Verify that the system remains adequately weighted or securely affixed.
- Ascertain that bolts, when used, remain flush and do not protrude
- Inspect the hydraulic hose for any defects. Do not use the system if there is any question about the integrity of the hose.
- Have worn parts replaced at once.

SPAS AND HOT TUB MAINTENANCE

- Spa water should be tested weekly for the presence of pseudomonas and coliform bacteria.

MATS MAINTENANCE

- Clean mats with a soap or disinfectant, wipe with clear water and dry thoroughly.
- Check the age and condition of the foam in the mat to avoid using a mat that “bottoms out.”
- Torn covers should be repaired or replaced.

PORTABLE LANDING PIT MAINTENANCE

- Check the foam memory. Landing pit foam should be replaced with new foam when the cells lose their ability to reload with air after compression.

TRAINING STATION MAINTENANCE

- Trampoline, dryboards and wetboards should be maintained according to the manufacturer's specifications.
- Dry platforms should be checked that the surface is level, rigid and non-slip.

OVERHEAD SPOTTING RIG - MAINTENANCE

On a regular basis, coaches should check:

- Ropes for fraying, especially the portion that feeds through the pulleys
- Ceiling clamps-fastened securely to the ceiling anchor points
- Pulleys-secured to the ceiling clamps and operate smoothly
- Lubricate pulleys often including the pins and inside of the wheel

SPOTTING BELTS MAINTENANCE

- Both types of spotting belts should be inspected continually for fraying and wear around the metal ring attachments.
- Twisting belts should be lubricated with graphite as often as necessary. Check the shock cords for fraying.
- Check swivel clips' pivotal axis and that it clips securely to the metal coupling rings of the spotting belt.

Benchmark

- ✓ Ensure that equipment is appropriate for athlete performance level.

DURAFLEX USAGE

- 1928-1936 Olympic Coach Ernie Brandsten, Stanford University, inventor of the tapered springboard and movable fulcrum, modified the fulcrum placement from 33% to 57% of the board length from the tip and changed the fixed fulcrum to one with limited mobility.
- Modern coaches teach divers to roll the fulcrum forward toward the tip for a stiffer board and backward for a looser board.

Benchmark

- ✓ Ensure that all athletes, parents/guardians and coaches know how to properly select, use and care for protective equipment.

SPARGER USAGE

- Spargers should be used primarily when there is risk of a flat or nearly horizontal landing.
- The bubbles are no substitute for proper skill progression.
- Initiate divers to the sparging system by letting them swim in the bubbles to orient themselves to its feel and action.

SPARGER USAGE

- Other activity in the diving area should cease before the operator activates the bubbles until the diver using the bubbles has exited the pool.
- Use an agreed upon start procedure.
- Divers should protect the head and teeth with the hands and arms against collision with the side of the pool or ladder in the upward current.

SPARGER USAGE

Operational air pressure levels
for:

- In-ground spargers-above 100 pounds per square inch (psi).
- Above ground sparger-between 120 and 180 psi

SPA AND HOT TUB USAGE

- At temperatures between 100 and 104 degrees F, most health and medical authorities recommend a maximum stay of 12-20 minutes.
- Pregnant women should not use spas, as temperatures above 102 degrees F may damage the fetus.
- Children under the age of 5 should not use spas because they are not yet fully able to regulate body temperature and risk brain damage in water above 102 degrees F.

GYMNASTICS MATS USAGE

- Coaches and athletes should understand that mats are designed to reduce the risk of injuries. Mats do not provide the user a failsafe against serious catastrophic injury, disability or death.
- No head-first dives should be simulated into basic mats, landing mats or skill cushions.

GYMNASTICS MATS USAGE

- Basic mats should not overlap. Velcro flaps attach one mat to another.
- Basic mats, landing mats and/or skill cushions should not be used in dry board or dry platform training as a landing surface in the place of a landing pit or on top of a landing pit to create a more stable landing surface.
- Most mats use plastic materials which burn toxic gases when they are burned.

PORTABLE LANDING PITS USAGE

- Lateral drift from improper take-offs must be taken into account when determining the width of a portable landing pit.
- In USA Diving programs, with twisting skills on dryboard performed in the overhead mounted spotting belt, lateral displacement is controlled, thus, USA Diving recommends a minimum width of 6 feet for landing pits.

TRAMPOLINE USAGE

- A good jumper is one who can maintain control while performing skills well, not just “going for the trick”.
- Never use a trampoline as a projectile device to jump from or to a trampoline.
- Only one person should bounce at a time.
- Divers should be dry when using the trampoline.

SPOTTING BELTS USAGE

- Children may be started at a very young age, but it is essential that the spotter adjust the belt to fit the young diver snugly.
- Twisting belts should be worn with the shock cord knobs of the inner belt pointing down.

PERSONAL PROTECTIVE EQUIPMENT -ANAPHALACTIC REACTION

- For known bee sting allergies that put the athlete at risk for a life-threatening anaphylactic reaction which may occur within minutes of the onset of the reaction, the athlete should have an EPI PEN (epinephrine) in his/her equipment bag on deck and stocked in the first aid kit and travel first aid kit.

PERSONAL PROTECTIVE EQUIPMENT -ASTHMA

If an athlete has asthma, an illness in which airways have on-going swelling:

- Quick relief inhalers, long-term inhalers and spacers should be labeled with the athlete's name and prescription and kept in a plastic bag located in the athlete's equipment bag or other place on deck designated by the coach.

PERSONAL PROTECTIVE EQUIPMENT -ASTHMA

If a diver has asthma,

- a written action plan from the health care provider, detailing how to use the specific inhaler and spacer for effective delivery of medication to the lungs including how many puffs, should be shared with the coach on deck responsible for the diver.
- in the event of an attack, the coach should get the diver out of the water, have the diver use the inhaler, and if in doubt, call 911 or the local emergency number.

LESSON 3

❖ ENVIRONMENTAL AND WEATHER CONDITIONS

STANDARD

- Monitor environmental conditions and modify participation as needed to ensure the health and safety of participants

Context

It is the coach's responsibility to protect athletes from adverse effects of climate-related factors. Effective planning for safety includes the consideration of environmental factors such as temperature, humidity, altitude, air quality, lightning, and other factors that may affect athlete health, performance, and safety.

Benchmark

- ✓ Provide information to assistant coaches, athletes, and parents/guardians on environmental safety in diving.

OVEREXPOSURE TO SUN

Coaches and divers should take precautions to lower chances of sun-related problems later in life such as:

- Melanoma-serious form of skin cancer
- Actinic Keratoses-sun induced skin growths
- Photoaging-skin becomes thick, wrinkled, leathery
- Cataracts-a loss of transparency in the lens which clouds vision
- Immune Suppression-sunburn can alter the distribution and function of disease fighting white blood cells for up to 24 hrs

FECAL CONTAMINATION

Organisms identified in swimming pool outbreaks of intestinal parasites from fecal contamination that are resistant to chlorine in varying degrees, easily transferred from animals to humans, or human to human, and cause diarrhea and other problems include:

- Nematodes-which cause asthmatic attacks, pneumonia, blood loss, iron deficiency, nausea, fever, muscle pain
Giardia-locates in small intestines stomach cramps, fatigue, nausea
- Cryptosporidium parvum-an intestinal parasite that causes vomiting, loss of fluids and electrolytes

Benchmark

- ✓ Facilitate appropriate hydration based on relevant environmental factors for all athletes.

LOSS OF BODILY FLUIDS

Loss of bodily fluids are directly related to:

- Temperature
- Amount of time spent in a warm/humid environment

HYDRATION

Coaches should be aware to:

- Provide athletes unlimited fluid/water intake during physical activity
- Instruct athletes to hydrate as often as needed especially in hot humid training environments to replenish fluids lost during training

Benchmark

- ✓ Stop or modify practice or competition in accordance with rules or policies designed to protect athletes from environmental dangers (heat, cold, thunderstorms, pollution, etc).

DUTIES OF THE REFEREE

- D6.5 In the case of unforeseen circumstances, the Referee may declare a short break, a postponement or a discontinuation of the competition. If possible, the break should be done after a full round of dives.
- D6.6 Following an interruption, the competition shall be continued from where it was stopped. The points scored before the interruption shall be carried forward into the remaining portion of the competition, whenever it is held.
- D6.7 When there is a strong wind, the Referee may give a diver the right to make a re-start without deduction of points.

RULES: POSTPONING EVENTS

- 105.1. Postponing Events. (a) When the majority of the officials and coaches present declare that a diving contest cannot be completed due to adverse weather or an act of God, the diving contest shall be postponed and held at a later time during the meet. If conditions still prevail whereby the contest cannot be conducted during the meet, then the diving event will be declare “no contest” and no champion will be named.

SOURCE: Official Technical Rules of USA Diving, 2008-2009 p G:8

RULES: POSTPONING EVENTS

- 105.1. Postponing Events. (b) The meet director, with the agreement of a majority of the coaches and officials present, may modify the list of dives to be performed in an event in order to qualify divers to the next level of competition (Junior East/West National Championships, Summer Zone Championships, Age Group National Championships, Junior National Championships, or USA Diving National Championships), but only if it is impossible to finish the competition.

SOURCE: Official Technical Rules of USA Diving,
2008-2009 p G:8

FECAL CONTAMINATION

In the event of an outbreak of fecal contamination the diving coach will need to modify practice plans and reschedule competitions while the pool operator takes the following action steps:

- Require all pool users to leave the pool, close the pool and remove fecal material.
- Raise free chlorine residual and adjust pH level according to protocols for 9hrs.
- Operate the filtration system for a minimum of 3 to 6 complete turnovers pumping all water in the pool through the filter. Three turnovers can be achieved within a 24 hr period in all public pools. ⁸⁹

Benchmark

- ✓ Develop an emergency weather plan.

HEAVY RAIN, HAIL, WIND

- If heavy rain or high wind (*experienced during a “tornado watch”*) obscures clear vision of the bottom of the pool (i.e. can’t see a 6 inch black disk on the bottom at the deepest part of pool), clear the pool.
- Clear the pool if it hails.
- A “tornado warning”, means that people should take shelter immediately. Go the basement or interior at the lowest level.

LIGHTNING POLICIES

Lightning policies must include both indoor and outdoor pools and address:

- electrical inspections,
- a procedure for early identification of storms and technology that will be used to identify them, and
- a pool closing procedure that uses a communication system to convey instructions to patrons.

WEATHER SERVICE- AVAILABLE TECHNOLOGY

Coaches should:

- Be aware of any storms predicted in 24 hours beforehand by checking the National Weather Service on-line at www.nws.noaa.gov
- Use technology to provide information on current weather conditions. Inexpensive solutions include:
 - ◆ Lightning strike detectors
 - ◆ NOAA radio

LIGHTNING POOL CLOSING

The National Weather Service recommends that indoor and outdoor pools be cleared in either of these two conditions:

- If “cloud to ground” lightning is observed and less than 30 seconds pass from seeing a flash and hearing thunder from that flash, and
- If “cloud to cloud” lightning is observed.

LIGHTNING POOL CLOSING

Once a storm with lightning has been detected, follow pool closing procedures that include:

- Get the divers out of the diving pool immediately.
- Divers should not stay on deck. Send divers to their dressing rooms with instructions not to touch shower handles, water spigots, or other metal objects that might conduct electricity.

LIGHTNING POOL RE-ENTRY

Re-entry protocol for return to pool after lightning storm has passed:

- Divers can re-enter the pool for use 30 minutes after the last lightning is seen or thunder is heard.