# LOOKING FOR TROUBLE

## Seeing Eye-to-Eye with Health Inspectors: Operator Tips for Recreational Water Facility Viability

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## Methodology

Key findings presented in this report were gleaned from a 2008 NSF International survey, sponsored in part by Axiall Corporation. The online survey netted feedback from more than 60 environmental health professionals who inspect recreational water facilities throughout the U.S. It included questions on their roles as environmental health specialists, inspection procedures and the types of health- and safety-related issues they often encounter. This report highlights some of the respondents' major concerns and emphasizes the importance of ensuring code adherence. Operational action steps included in the paper are based on the expertise of Austin Looper, Axiall senior research associate for Accu-Tab® Chlorination Systems.


## Introduction

The Centers for Disease Control and Prevention (CDC) estimates that there are approximately 360 million visits to recreational water venues annually, making swimming one of the nation's most popular recreational activities. At the same time, pool and waterpark patrons rank recreational water illnesses (RWIs) second only to personal safety (slipping, falling, drowning, etc.) among their water-related safety concerns. Clearly, regular inspections of these facilities are vital to keeping them safe and healthy for users.

## 92% of inspectors or their colleagues have shut down a recreational water facility in the past three years.

The NSF survey found that within the past three years, 92% of the health inspectors who replied had either shut down a facility in their area or knew a colleague who had done so. While these shutdowns were usually only temporary until a specific violation was corrected, the vast majority (85%) of the inspectors cited poor water quality/clarity as the reason for the shutdown.

### Inspectors are Experienced and Well-Qualified.

**The environmental health inspectors surveyed by NSF represented a cross section of job experience ranging from 4 months to 35 years.**

- **Approximately 69% have completed Certified Pool Operator (CPO) and Aquatic Facility Operator (AFO) courses.**
- **85% received on-the-job training, providing them with a high level of experience and competency.**

- **65% of inspectors have five or fewer people conducting audits in their inspection area.**

## Inspectors wear many hats.

Environmental health professionals conduct inspections at various types of recreational water facilities. The facilities discussed in this survey include:

- Apartment complexes/homeowners' associations
- Hotels/motels
- Health clubs/YMCAs
- Community pools/parks and recreation
- School/university facilities
- Waterparks/resorts

Of the environmental health professionals surveyed by NSF International, 98% said that they are required to conduct inspections at locations in addition to recreational water facilities. Those additional facilities are restaurants (named by 40% of inspectors), water wells (named by 21% of inspectors) and others (named by 37%), which included wastewater treatment plants, campgrounds, schools, day cares, etc. Furthermore, 60% of inspectors reported that there are more than 75 recreational water facilities in the area they are responsible for and 65% of all respondents have five or fewer people conducting audits within their respective coverage areas.

In summary, the number of inspectors who audit recreational water facilities is limited and their responsibilities continue to increase. This wide range of inspection responsibilities limits the ability of environmental health inspectors to audit commercial pools and hot tubs within their jurisdiction on a regular basis. Facility operators must take more personal responsibility to ensure the health and well-being of their patrons.

- **Pool management records were referenced during more than 75% of inspections.**

## Water quality testing and recording.

Since water quality is so integral to the recreational water experience, inspectors in the survey were asked if they personally test water quality at the facilities for which they are responsible. 95% of inspectors perform water tests on a regular basis at the facilities they inspect.

Levels of chlorine or other sanitizing chemicals were tested 93% of the time, pH balance 92% of the time, and operation of the filtration/circulation system was tested in more than 83% of the inspections performed. Pool management records were referenced during more than 75% of inspections, and 30% of inspections also involved checking levels of turbidity, contamination, fecal accident logs, and similar data.

## Water quality violations at water sources.

Some types of recreational water facilities are more susceptible to water quality violations than others. This is usually true of sources with lower volumes of water in them such as hot tubs and kiddie pools; the majority of inspections at these water sources turned up at least one violation.

The kinds of water quality violations found in these water sources ranged from chlorine and pH levels that are too low or too high to turbidity and water circulation problems. Most violations were chemical-related, though a significant number also cited problems related to malfunctioning or improperly calibrated water sanitization and circulation equipment.

- **85% of inspectors cited poor water quality/clarity as a reason for shutting down a pool. Most violations were chemical related.**

## The most common violations and where they happen.

20% of inspectors cited poor records among the most common violations they have encountered. Another problem area noted in the survey involved chlorine (or other disinfecting chemicals) and pH levels that were either too high or too low. Turbidity also was noted as an issue.

Hotel/motel pools and hot tubs were the most frequently cited source of water quality violations with 70% of inspectors finding violations. This was closely followed by apartment complexes and homeowners' associations with 68% showing at least one violation within the past year. Health clubs fared somewhat better with 27% of inspections turning up violations. Community pools/parks and recreation facilities showed a 14% rate of violations and inspections at waterparks/resorts resulted in the least amount of water quality violations with only 5% of inspectors reporting violations during their visits.

- **Approximately 20% of the inspectors surveyed reported that they routinely perform spot inspections in response to complaints about water quality or other water-related safety issues.**

## Frequency of Inspections.

Because comprehensive inspections are vital to maintaining patron safety and health at recreational water facilities, the survey also asked inspectors how many times, on average, each type of facility in their geographic area is audited. 42% of community pools were reported to be inspected once per year or less and similar numbers were reported for apartment complexes and hotels/motels. 48% of waterparks/resorts are inspected once per year or more while 40% of school/university facilities are inspected multiple times per season.

### State Codes: A Key Guide

**State code requirements are the source of standards and information for 95% of the inspectors surveyed.**
**The remaining 5% referenced county, local and municipal codes when performing their inspections. These replies show that operators and managers of recreational water facilities have the responsibility to educate themselves as to the requirements of the codes under which they must run their facilities.**

## Inspection requirements: Getting the message out.

The job of inspecting recreational water facilities becomes somewhat easier if everyone references the same information on procedures and requirements. To help facilities better understand pool inspection requirements, some inspectors go so far as to provide training to pool employees on the inspection process and regulations. Others provide copies of codes, monthly forms and guidance documents. Both examples, however, appear to be the exception as opposed to the norm.

Specifically, only 35% of the inspectors surveyed actually distributed printed copies of their required codes to commercial pool operators and/or managers. Some explained that the inspection form lists all possible violations on the “reverse side.” Because each state, county or municipality handles education about inspections differently, it is often the responsibility of the pool managers/operators to acquire and have the applicable codes readily available.

100% of the surveyed inspectors said that operators and managers have access to the code requirements for their areas, either through direct request to the inspectors or by accessing the codes via local and government agencies or on the Internet.

## Operator proficiency related to health codes.

When questioned about the competency of pool operators and/or managers with whom the inspectors interact, 62% replied that they consider only half, or less than half of the managers/operators with whom they interact to be well-trained or well-informed regarding inspection requirements. These figures appear to show that while recreational water facility operators and managers have access to all relevant codes and requirements necessary for safe operations, many are not fully educated in these important areas and need to acquire, and diligently follow, the codes under which they must run their facilities.

Inspectors also were asked whether they interact with the same individual operators or managers at the recreational water facilities they inspect. The responses varied depending on the type of facility inspected—especially since a number of commercial pools experience high seasonal employee turnover.

### Consistency of Staff

| Health clubs | School/ university facilities | Community pools/parks & recreation | Apartment complexes/ HOAs tied with hotels/ motels | Waterparks/ resorts |
|---|---|---|---|---|
| 72% | 67% | 62% | 47% | 37% |

These findings underscore the importance of educating all staff members on a regular basis about regulatory codes.

**Product Standards Used in Inspections**

| NSF | UL | ASME |
|---|---|---|
| 87% | 39% | 33% |

## Product standards and facility inspection procedures.

The most frequently-used product standards cited by survey respondents during recreational water facility inspections are those of the NSF (87%), followed by UL (39%) and ASME (33%). State, city, and local codes also are cited by individual inspectors.

Regarding equipment inspected at the facilities, 74% of the surveyed inspectors verify that chlorination systems are certified to NSF/ANSI Standard 50. However, a number of them indicated that they do not always check to be sure that the proper chemical, as prescribed by the manufacturer of the equipment, is being used. Environmental health inspectors and operators of these facilities need to understand that operating chlorination equipment and not using specified chemicals (often by brand) will automatically void the NSF/ANSI Standard 50 certification and, in many locations, is a state code violation.

## Relative importance of facility components and frequency of testing.

The relative importance of the components closely mirrors the frequency with which these components are checked by the surveyed inspectors. Again, pool water quality was checked most frequently with 92% of the inspectors reporting that it was “always” checked. Posted signage and placards are checked 88% of the time, and safety of the building and grounds followed with 82% of the time. These figures indicate that inspectors of recreational water facilities and waterparks are diligent about doing their job and are aware of which components require the most frequent inspections to maintain health and safety standards.

Maintaining proper chlorine levels, chlorinator capacity and certification for chlorinators are important issues for recreational water facilities.

**Inspectors were asked about the most important factors at the facilities they inspect. The results are as follows:**

- **Pool water quality (pH balance, residual disinfectant levels, etc.) was rated the most important factor by nearly 85% of inspectors**
- **Safety and security of the building and grounds was identified by 45%**
- **Pump room/chlorinator was mentioned by 35%**
- **Circulation rate was mentioned by 20%**

Most state regulations mandate chlorinator capacities in relation to pool volume (i.e. “The chlorinator must be capable of delivering 3 pounds of chlorine for every 10,000 gallons”) so that the equipment is capable of maintaining safe water.

Pool volume is a very important factor in determining chlorinator size, but other important factors include:

**Indoor/Outdoor Use:** Ultraviolet (UV) radiation from the sun destroys available chlorine in the water. As a rule, outdoor pools will use more chlorine than indoor pools.

**Bather Load:** A busy pool will use more chlorine per given volume than a lightly used pool.

**Water Depth:** A shallow body of water, like a zero-entry or kiddie pool, will consume chlorine faster than a deep water pool. Shallow water is more susceptible to UV rays and has more bather load per volume than deep pools.

**Spray Features:** Aeration causes water to lose chlorine faster than still, deep water. Spray features are fun for patrons, but use chlorine quickly.

Always tend towards oversizing of chlorinators to handle these types of tough conditions. A chlorinator can always be “turned down,” but nothing can fix an undersized chlorinator—it should always be sized for peak demand.

**TIP: Print this page and the following to use as a checklist for your facility.**

# What recreational water facility operators can do.

There are a number of ways in which managers/operators of recreational water facilities can avoid problems and keep their facilities fun and safe for their patrons. It all starts with encouraging managers and operators to take a more active role in maintaining their facility's water quality.

## Preventing pool shutdowns:

- ❑ Have all codes printed out and readily available.
- ❑ Invite local health officials to the pool to review codes prior to opening so staff can make themselves familiar with them and know what is expected on a daily basis.
- ❑ Make sure all equipment is in adherence to codes and is operated according to the manufacturer's recommendations without exception.

## Dealing with owners, operators, and managers:

- ❑ Require that persons who operate the pool attend Certified Pool Operator (CPO) or Aquatic Facilities Operator (AFO) training. Visit **www.nspf.com** or **www.nrpa.org** for more information.
- ❑ Set up a regular routine for checking pool water.
- ❑ Keep the pool's log in a specified location and stress the importance of maintaining accurate records.

## Handling water clarity and sanitizing values:

- ❑ At the beginning of the year, buy and devote one test kit for every body of water.
- ❑ Pay special attention to pH and chlorine measurements.
- ❑ Don't use chlorine products that contain cyanuric acid (trichloroisocyanurates) in indoor pools. ➤

- ❑ Beware of overstabilization: Laboratory studies have shown that as little as 50 ppm of stabilizer (cyanuric acid) can increase time needed to deactivate Cryptosporidium by up to 8 times—making it extremely difficult to achieve the required 99.9% inactivation level by hyperchlorination. Avoid using stabilizer where it is not needed, such as indoor pools.

## Equipment Issues:

- ❑ Know your relevant state codes regarding chlorinator sizing. When in doubt, oversize.
- ❑ Follow the manufacturers' recommendations for the use of equipment and chemicals without exception. Health and safety issues are often encountered when operators do not adhere to guidelines established for equipment operation and/or chemical specifications.
- ❑ Stay within NSF/ANSI Standard 50 Guidelines by using only chemicals recommended by the manufacturer in flow-through chlorinators. The water quality issues mentioned throughout this report reference low chlorine levels along with pH problems as a high concern. Use of independently tested and specified chemicals (often by brand) may help operators avoid this problem. More importantly, use of any chemicals other than those specified could present a serious safety risk and will void your NSF certification.
- ❑ If you are putting in any new chlorinator equipment, it is best to oversize it to accommodate unexpectedly high bather loads. Running a larger chlorinator does not require using large amounts of chlorine. Large chlorinators are more effective during the heat of the day and during heavy bather load.

## What this all means.

Environmental health officials are on the front line in the ongoing battle to keep the recreational water facility experience safe and healthy for patrons, and this survey shows that they are achieving high marks in their endeavors. However, ensuring that the growing number of our nation's recreational water facilities remains safe may be more than the current level of inspectors can handle. It is important for operators, managers, and owners to take a proactive "code-focused" approach and maintain facilities in a manner that is operationally sound and patron-safe at all times.

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