

# Independent Pool and Spa Service Association

Volume 8, No. 7, July 2007

## 'It's a horrible, life-altering injury'

BY JEFF STRICKLER AND SUSAN FEYDER

MINNEAPOLIS -- This story contains graphic and explicit language.

A 6-year-old Edina, Minn., girl remained hospitalized in serious condition Wednesday after an unusual accident in which several feet of her intestine were pulled out by the suction of a swimming pool drain.

Abigail Taylor was injured June 29 in the wading pool at the Minneapolis Golf Club in St. Louis Park and taken to Children's Hospital for surgery.

"It's a horrible, life-altering injury," said Robert Bennett, the attorney for Abigail's parents, Scott and Kathryn Taylor. Bennett said doctors had to perform surgery to remove the part of Abigail's intestine that remained following the accident. He said it is likely that she will have to be fed intravenously for the rest of her life.

### 'Strong little girl'

Doctors now are concentrating on preventing infection and managing pain, and are also deciding what course to take on further potential medical procedures to treat the injury, he said.

Bennett said Abigail does not yet know the full extent of her injuries. "She knows she's been hurt," he said. "She's a strong little girl. How she extricated herself from that drain I'll never know."

Although some details of the accident are still fuzzy, it is known that Abigail was able to free herself from the drain and the pool without calling for help. As a result, the extent of her injuries wasn't immediately evident to those near her.

In a message posted on the Caring Bridge, a nonprofit Internet site that offers free Web pages to families of people recovering from illness or injuries, the Taylors said the protective cover on the pool's drain had come off.

### Earlier warning

If so, the scenario of the injury fits a pattern that the U.S. Consumer Product Safety Commission warned about in a 2005 report, *Guidelines for Entrapment Hazards: Making Pools and Spas Safer*.

According to the report, if a child sits on an open drain, the suction, which can reach several hundred pounds per square inch, can rupture the rectum and eviscerate the child in a matter of seconds.

There have been three such incidents since 1990, none of which were fatal. The most recent was two years ago when a 3-year-old was disemboweled by a hot tub drain.

None of those accidents was fatal, although in the same time span 13 people, most of them children, drowned after being caught in underwater drains.

Bennett described the Taylors, who have three other daughters, "as brave and optimistic."

### New regulations

Congress is considering new pool-safety regulations. Instead of having one main drain, both public and private pools would be required to have multiple drains with reduced suction. Owners of existing pools would be able to install safety release sensors that will turn off the suction if it the system is blocked.

Article reprinted from Fort Worth Star Telegram Friday July 6, 2007

IPSSA Membership has its benefits:

July Birthday's

# WEBTALK

If your information on the IPSSA websites (that includes IPSSA Texas) needs to be updated don't hesitate to contact me. [ipahl@sbcglobal.net](mailto:ipahl@sbcglobal.net) – or – 817-595-1167

Thank you, Ingrid  
Web Design and Maintenance - Questions, Problems, or Comments?

**Our Member Meeting are:**

**Tuesday, July 17<sup>th</sup> – 7pm**  
**Tuesday, August 21<sup>st</sup> – 7pm**

La Playa Maya Restaurant,  
1540 North Main Street  
Fort Worth, TX 76106 - 817-624-8411  
That's a few blocks south of the  
Stockyards. We try to arrive around 6:30pm with the meeting called

to order at 7:00pm. We do our best to finish by 9:00pm

*Speakers for the July  
Member Meeting:*

Jon Gartner

**Officers Meeting –**

**Monday, July 2<sup>nd</sup> – 7pm**

**Monday, August 6<sup>th</sup> – 7pm**

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**POOL QUIZ**

- |   |  |
|---|--|
| <p>1. What does pH stand for?</p> <ol style="list-style-type: none"> <li>Potential hydrogen</li> <li>Pounds of hydrogen</li> <li>Power of hydrogen</li> <li>Any of the above</li> </ol> | <p>2. If you pour muratic acid into a pool as you walk around it. Which of the following will you affect the most?</p> <ol style="list-style-type: none"> <li>pH</li> <li>sanitizer level</li> <li>pool plaster</li> <li>total alkalinity</li> </ol> |
| <p>4. Sodium dichlor can be used in erosion type chlorinators</p> <ol style="list-style-type: none"> <li>True</li> <li>False</li> </ol>   | <p>3. pH's below 7.2 may cause</p> <ol style="list-style-type: none"> <li>corrosion</li> <li>scale</li> <li>poor filtration</li> <li>all the above</li> </ol>  |
| <p>6. the pH of the water determines how much hypobromous acid and hypobromite ions are produced.</p> <ol style="list-style-type: none"> <li>true</li> <li>false</li> </ol>             | <p>5. The goal in adding extra chlorine to destroy chloramines is to reach breakpoint. All the chlorine added after that point is free available chlorine</p> <ol style="list-style-type: none"> <li>true</li> <li>false</li> </ol>                  |

## *Region 9 Director Campaign*

In January 2002 I started down the path of learning the pool business. I had a great mentor who turned out to be a good friend, as well, in Jason Bonser. I basically was his butt boy for two very cold weeks (he kept the window down in his truck) while I learned what it meant to be a pool guy. I got my first two customers in March of that year from Greg and Rex. That's when I was reminded of the old saying; "be careful what you wish for". In the spring of that year I joined our IPSSA chapter and in 2004 you elected me as our chapter secretary. In 2006 I was again elected by you to be a chapter officer, but this time as your vice president and rep at the region 9 quarterly meetings. Then came my involvement with the Texas Pool & Spa Show, first as a classroom teacher and for the past two years as the education director. During this five plus year period my business has grown from Greg and Rex's generosity of two accounts to a customer base of 65. Along the way IPSSA and it's fellow chapter members have truly helped a new guy who gave up the corporate life make his way in a life I would not change for anything.

After careful consideration and long direct conversations with my wife, Linda, and others in IPSSA whose advise and council I respect I, have decided to "throw my hat in the ring" and run for our Region 9 Director's position. The current director, Greg Donoho, has decided not to seek re-election so he may spend more time with his family, which I admire and support. There is no doubt that Greg has moved IPSSA, in general, and Region 9 in particular way ahead of where it was two years ago and we owe him a debt of gratitude for his effort. I plan to continue that effort, secure affordable health care, and work to bring greater awareness of IPSSA to all in the pool industry here in Texas and Florida should I be elected to lead Region 9 for the next two years.

Thanks from a grateful pool guy,  
Dave Boyd

**The Texas Pool and Spa Show  
January 9-12, 2008**

Planning for the 2008 show is underway. We are looking for a few good Men and Women. If you are interested in being considered for a committee or board member please talk to Jason or Dave. The 2008 show will be at the Fort Worth Convention Centre, and we are all very excited about all the upcoming events.

**Brad's Corner**

What kind of salt do I need to use for the chlorinator?

The salt you need for the chlorinator is pure, non-ionized salt, the same salt that is used for home water conditioners. You can buy salt at most pool stores and home improvement centers.

# Chapter Supporters

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<h1>Fort Worth Chapter</h1>		

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## June Meeting Attendance

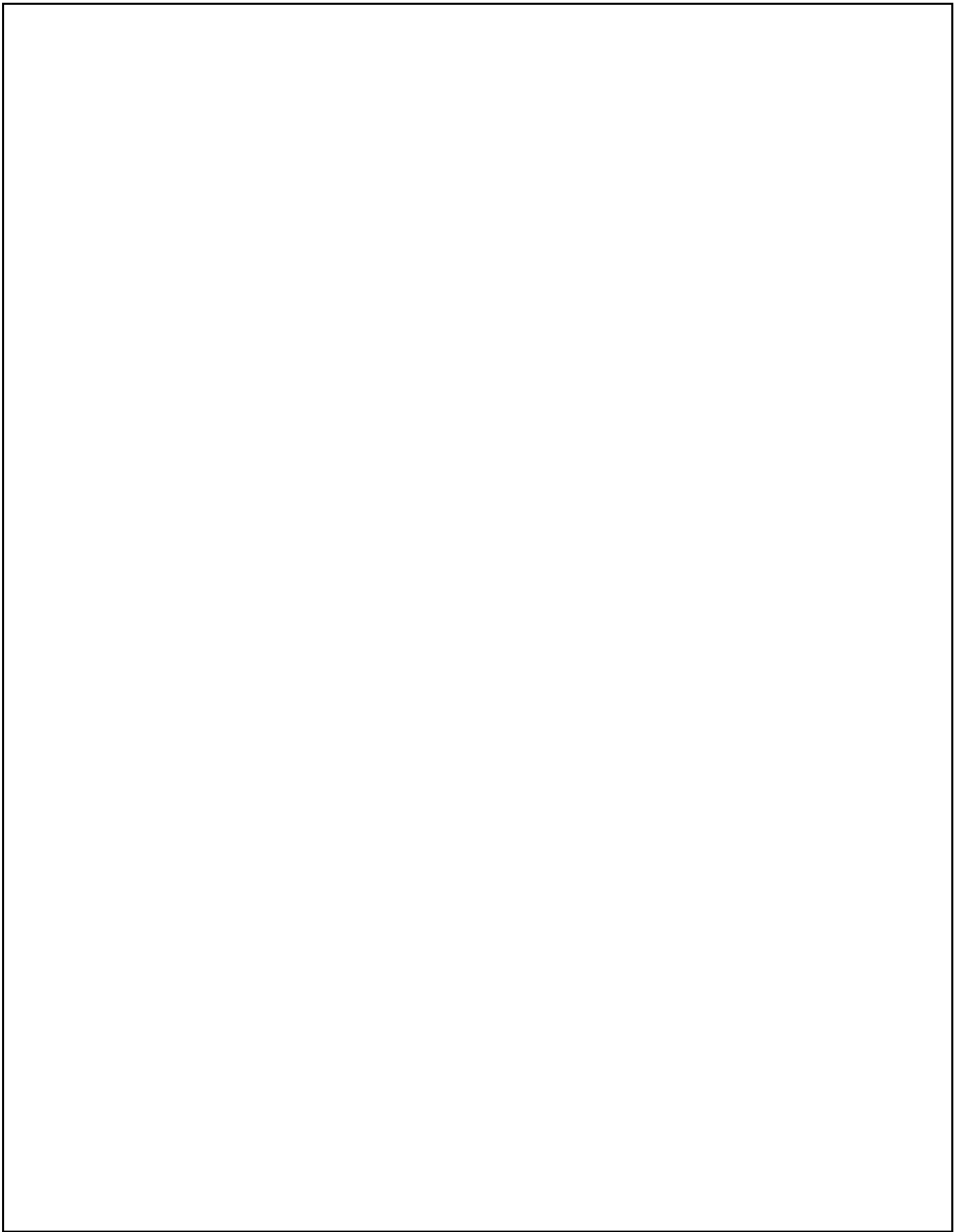
The following member companies were not represented in June at our member meeting:

All Star Pool Service, Alpine Pool Service, Clean Waters Pool Service, G & D Pool & Spa Inc.  
Gorilla Spa Service, Metro Blue Water Pools, Pool Aid.

If there is any mistake let me know, Splash Gordon's 817-589-7707 – Chapter Secretary.  
Our standing rules call for a \$ 54.00 fine for missing two meetings in a row. Upon a third consecutive absence, the board may remove membership. It is your responsibility to make sure that you are counted in attendance at the meeting or to let one of the officers know that you are unable to attend a meeting! Hope to see you all at the next meeting.



SPLASH



## FILTRATION ~ FACTS, FALLACIES AND FUTURES

The following article first appeared in Splash, the official and very popular magazine of the World Waterpark Association. It begins with fundamentals well known by most PPOA members, but proceeds to bust a number of popular myths that have been misleading operators since the Romans invented filtration...

Filters, everywhere in our environment, allow little stuff to pass through and keep the big stuff out. They're in cigarettes and coffee pots, automobiles and air conditioners. They appear as window screens, fish nets, and accordion-pleated rolls of paper. Filters are so critical to the function of swimming pools and water features that a room has been named in their honor. No matter how important we think these appliances are, however, filters are often assigned virtues well beyond their capabilities. It's important to know what they will do and what they won't; with reasonable expectations we can get the very most out of them ? or into them ? and leave sanitation, oxidation and other miracles of pool care to different devices.

First, let's look at some FACTS:

Obviously, removing suspended solid material from recreational water to make it clear and "clean" is our goal. To accomplish this particulate removal through filtration, there are many alternatives open to designers and builders. Sand, diatomaceous earth, cartridge and more ? there exists a variety of types, sub-types and sizes in the world of pool filtration even among the three major categories. Which one should we choose?

There's been plenty of sparring for "best" between pool owners and operators based on individual preferences and performance comparisons. However, all three types, assuming they are of good design, deliver effluent of equal quality. It is little more than an intellectual exercise to debate which of them will remove the smallest particles in terms of microns or of water clarity. Any seasoned operator, when presented with a crystal-clear pool, would be challenged to determine which category, much less type, of filter was on line. She or he would have a one-in-three chance; polished water looks like polished water, no matter how you got it that way.

Of the two most commonly used filter categories the sand system is the easiest to understand so will be our focus here. The specific technology called "high-rate" sand filtration ? now gaining dominance world-wide ? will be included in most of this conversation. Let's first look at the concept called particulate "entrapment".

Just what is big and what is little, in the context of water turbidity and particle size? Good filters stop solid particles from around 5 microns to 20 microns in dimension, and all sizes larger. (One micron, incidentally, is .00004 inches...) Here are some interesting size comparisons in terms of known materias. Note that a typical human hair is 70 microns in diameter and the lower limit of human visibility is about 40 microns, so 5 or even 20 microns is pretty tiny indeed.

ONE AVERAGE GRAIN OF TABLE SALT 100 MICRONS  
HUMAN HAIR 70 MICRONS  
THE LOWER LIMIT OF HUMAN VISION 40 MICRONS  
WHITE BLOOD CELLS 25 MICRONS  
TALCUM POWDER 10 MICRONS  
AVERAGE BACTERIA 2 MICRONS

Turbidity, however, is based on the density (numbers in a specified volume) of particles even more than on particulate size. Filters must remove virtually all of the larger material and most of the smaller in order to render the water "sparkling clear." (Even then chlorine or another oxidizer must be in the equation for that polish you're looking for...)

Soil is captured in the sand filter bed by a combination of two processes: First, solid particles lodge in the extremely small spaces and voids between the sand particles and, second, gelatinous and mucous-like substances and oils tend to cling to the grains of filter sand. The latter, then, enhances the mechanical effectiveness of the former, as "soil entraps soil" and the filter efficacy actually improves over time and usage. (In the high-rate version, this phenomenon works its way deep into the sand bed rather than existing only on the surface ? hence the term "three-dimensional" filtration.)

As these two dirt-collecting mechanisms work together, the filter stores up more and more of a gelatin-and-soil-filled bed. The filter is now extremely effective in removing suspended soil and the resultant water quality is optimum for many days.

Finally, however, the cycle comes to an end. The loaded medium becomes increasingly dense and, ultimately, resistant to water flow. At some point adequate flow can no longer be sustained; the filter must be cleaned. We know the time has come because the pressure in ? influent ? goes up, pressure out ? effluent ? goes down (up to 15 psi differential), and the reading on the flow meter drops ten percent or more. The cleaning process, called backwashing, is accomplished by re-directing the water flow backwards through the filter, generally from the bottom up, in order to expand and scrub the sand. The entrapped soil is thus carried out to waste in no more than about three minutes per tank.

Valves are switched back, and a new filter cycles begins all over again.

Now let's expose some FABLES:

Most any sand will work in a high-rate-sand filter.

No. Sand grade and grain type are very important. Crushed, angular silica sand works well while rounded beach sand (typical of sandblasting material) is very poor for entrapment. The sharper the sand the more likely particles will be held while allowing the water to pass. Filter companies are particular about the sand sources for their filters.

The size of the sand particles serving as the filter bed is an important consideration too. If the sand is too coarse, the voids between the particles are too large to efficiently stop the passage of fine solids. If it's too fine, the bed will be too dense and very little space is left for dirt to accumulate between the sand grains. The sand particle size best for pool filters has been established in a range of 0.4 to 0.6 millimeters, or, in grade, number 20. Number 30, a finer sand grade, is sometimes recommended for indoor pools when the soil volume is inadequate to effectively load the more common grade.

It is best to change the filter's sand every year.

No. Well cared for sand never needs changing. Backwashing does not "wear out" sand during the brief 100 to 300 minutes per year that sand scrubbing occurs. After all, it took nature hundreds, even thousands of years to create and round off that sand on the beach. Calcified or oil-laden sand may have to be replaced, but that's your fault, not that of the filter or the media.

If the water gets cloudy, we need to backwash.

No. Cloudy water can occur for a variety of reasons, but it's rare that simple backwashing will improve things. Backwashing places the sand filter, temporarily, in its least effective mode ? hardly a help for your cloudy water. You need to do it, but only when you need to do it. The dirtier the filter the better, until the filter begins to stop water. Then and only then is when you need to backwash. Early in the new cycle the filter's efficacy is not optimized; it takes from a few hours to a day or more to establish that natural "floc" of gelatinous material and fines in order to propagate the process. Those operators who backwash by the calendar or clock rather than by the gauges are guaranteeing that their filters run less efficiently than they could. Frequent, unnecessary backwashings can make sand filters run downright poorly! Don't backwash your filters along with the Saturday bath; they probably don't need it as badly as you might.

( With indoor pools and water features, "breakthrough" of fines is possible, requiring what appears to be premature backwashing ? where the differential was never achieved. This is unusual and often is the result of an improper sand choice.)

If we can't backwash at design flows, lower values for longer periods work just fine.

No. Backwashing must be done at the design flow, usually 15 gallons-per-minute for each square foot of filter surface area. A slower rate, for inadequate sewer lines or whatever reason, is certain to allow conglomerated sand to develop. Also, with hair or lint often serving as a structure, balls of organic material ? "mudballs" in pool terminology ? will form and become imbedded in the top layer of sand. If the backwash velocities are insufficient to break up and wash the clumps to waste, they will work their way deeper into the filter bed, helping to create "channels". Ultimately such ant-nest-like passages will permit unfiltered water to take the path of least resistance through the medium ? and our systems fail to function.

In poorly flushed sand, living organisms can propagate, too. This colonization of pathogens can be dangerous. Fix

## FILTRATION ~ FACTS, FALLACIES AND FUTURES.... continued from page 9

the waste line or install a holding tank for backwash water so the full, backward flow can be used to keep your sand healthy.

Iron, manganese, copper, and calcium can be removed by filters.

No. Nothing but suspended solids is removed by filtration. Suspensions and solutions are very different. Dissolved solids like salt and intentional calcium hardness (remember TDS?) cannot be seen by the filter media. Iron pipes, copper heater elements, calcium plaster and grout, impeller metal or any other affected solids, when dissolved or "in solution", are solids no more; essentially, they are part of the liquid and will fly right through our filters. Ultra-fine suspension won't stop on its way through either; "colored" water, otherwise transparent, is an example. If you raise the pH accidentally to well over 8.3, you may in fact precipitate your formerly dissolved solids. Your whole pool will be a mess, so this is to be avoided. For the most part, dissolved solids are invisible and harmless to your system, your patrons and your chlorine's work potential. Don't expect your filter even to notice them.

Filters stop bacteria and sanitize water.

No. There are many who confuse the filtration function with the disinfection function. Disinfection is the chemical process of killing disease-causing bacteria and other micro-organisms, accomplished in the body of pool water itself. Bacteria are generally far too small to be noticed by your filter media. Most pathogens sail right through the sand and back to the pool. Remember it is chlorine (or equivalent) that has the job of sanitizing; the filter's assignment is to remove the "big pieces", mostly those inorganic suspended particles that the chlorine can't oxidize.

Filters do remove soils that, if not removed, might impede the sanitation effort. Those who think of filtration as part of the disinfection process, however, because a filter may be capable of removing some pathogens, have been misled. This removal is not particularly beneficial, and can be a problem if relied upon.

Cryptosporidium, a large oocyst (six to eight microns in size), can in fact be trapped in a well-loaded filter. Recently, a focus on filtration for crypto removal has shown up in fecal-accident recommendations. It is not reasonable to expect the filtration system to remove all such infestation, even in three or four cycles. Too much of the water never sees the filter in a day, or even two. Chlorine's still got the primary job. (Crypto is another conversation for another time...)

And, finally, let's imagine Filter FUTURES:

Automated and sequential backwashing, remote management, sand alternatives, new packaging and efficient configurations have been emerging for a while. The next step may be the intelligent breaking of a longstanding rule: Never floc a high-rate sand filter. While old, two-dimensional sand filters benefited from this addition of a coagulant or other filter aid, adding alum, polymer, PAC or another flocking agent to the three-dimensional process in an attempt to improve output has always "blinded" the bed. The water often looked better, at least at the very beginning hours of a filter cycle, but too much build-up created the need for premature backwashing. No amount of care in the trickling in of the micro-flock avoids this problem; eventually, either too little is added to do any good or too much collects and filtration grinds to a stop. In every case, we lose filter cycle time, labor, energy and water; we simply come out short. Flocking high-rate sand is a flop.

But what if we could somehow control a filter's output qualitatively? That's how our chemical controllers and our thermostats do it. Choose a desired outcome, seek it by measuring results, then stop the feed (in this case the polymer) before problems arise. Let's use a turbidimeter on the filter's effluent and trickle in a flocking agent while we watch results! If our output is, say, 0.3 NTU (Nephelometric Turbidity Units) and we set the instrument ? the controller ? to 0.1 NTU, the relay remains closed and a tiny pump feeds well-chosen polymer until the improvement in clarity is achieved (or no more improvement is observed by the meter). Then the feeder is shut off. The "clarity controller" patiently waits until the clarity degrades slightly ? to a point pre-selected to trigger feed again.

All successful automation uses qualitative management rather than quantitative, blind feed. A controller of this type will avoid high-rate sand's only real drawback, the marginal quality during the beginning of each filter cycle. Such a subtle, monitored application of filter aids may in fact make high-rate-sand filtration better than it's ever been before. Look for this leap in filter technology in our filters' collective futures... Maybe there will be a reason to brag about one category of filter after all.

~ kw

## Suction Entrapment

When I heard about the first “Evisceration/Disembowelment” incident in 1990 I had been in the pool business for 3 years. The horrible nature of this injury made it “Front page News”. I believe “60 Minutes” ran a report. As I understand it, this first event also happened to a child in a shallow wading pool with only one main drain. In the first occurrence the pool maintenance person had “closed off” the pool’s skimmer because he was tired of the kids removing the basket and seeing what they could feed down the suction line. This left all the pump suction coming from the main drain. Apparently the anti vortex cover over the drain pot had not been installed with screws and had been removed earlier that day by some other children that had been using the pool. This left an uncovered main drain pot, in shallow water, on a dedicated high pressure pump. When a small child sits down over such a strong suction, in less than a second the intestines are sucked outside of the body. Although none of the three such occurrences has resulted in death, the lives of these children have been horribly changed forever. Doctors can’t repair the damage. A lifetime of intravenous feeding, infections and physical disability await the victims. The law suites are huge with everyone involved. Builders being included, service techs and equipment manufactures become defendants and all of them loose. In the 1990 case the drain cover had been improperly installed without screws (ever wonder why the Swimquip/StaRite Anti Vortex covers now come with screws installed and held in place with little rubber washers??) A huge settlement was made by the manufacturer of the main drain. Another settlement was made by the pump manufacturer, it could have been any pump manufacturer. None of them has ever advocated the installation of their pumps on a single main drain. No one wants to go to court where the plaintiff is an injured child. Nobody wins. The commercial pool industry in Texas has seen many changes and upgrades to prevent suction entrapment, starting in 1999 Dual or oversized main drains is probably one of the best ideas. Safety Vacuum Release Systems can protect against body suction entrapment. “Anti Hair Snare” drain covers help prevent hair entrapment. There are five potential suction hazards that are generally identified.

1. Hair entrapment – hair becomes knotted or snagged in an outlet cover.
2. Limb entrapment – a limb sucked or inserted into an opening of a circulation outlet with a broken or missing cover in the pool resulting in a mechanical bind or swelling
3. Body suction entrapment – suction applied to a large portion of the body or limbs resulting in an entrapment
4. Evisceration/disembowelment – suction applied directly to the intestines through an unprotected sump or suction outlet with a missing or broken cover.

5. Mechanical entrapment – potential for jewelry, swimsuit, hair decorations, finger, toe or knuckle to be caught in an opening of an outlet or cover.

Although the layers of protection (dual drains, SVRS systems and anti hair snare covers) all increase the safety of the pools and spas, there will never be a substitute for adult supervision and proper maintenance.

This litigious society requires that all of us in the pool industry be especially observant for all dangerous conditions we may encounter. We are the experts that are supposed to protect our customers, whether we like it or not. It can also add another profit potential for our business. Why not insist on dual main drains when doing a remodel? Why not suggest one of the SVRS systems as an upgrade? Currently the manufacturers of the SVRS systems are lobbying at both the State and National level to have an SVRS required on all new residential pool and spa construction. Existing pools and spas will probably follow.

Currently in Texas there are four types of SVRS systems that are approved:

1. The Stingl Switch SVRS in an electrical system that monitors vacuum and shuts the pump off if a suction entrapment is detected. A new version works on residential pool/spa systems using only one pump
2. The Vac Alert is a mechanical device that mounts on the suction line of the pump. When an entrapment is detected it opens to air and the pump loses prime.
3. Hayward has a new system call the Stratum VRS, it is an electrical system that also monitors the pump’s vacuum and turns it off if entrapment is detected. It will also work on 2-speed pumps. Hayward recently held its first training session here in Fort Worth for IPSSA members. You have to be certified to both purchase and install this unit.
4. A.O.Smith offers the “eMod” motor as a replacement pump motor that also monitors for suction entrapment.

I’m sure that other manufacturers will offer their versions of SVRS systems in the future.

SPLASH

Please check our on-line calendar for other upcoming events!  
Contact me to keep the calendar updated -  
Let me know when there is an event coming up that should be brought to everyone's attention!

IPSSA Fort Worth  
P.O. Box 820852  
N. Richland Hills, TX 76180  
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## Brad's Corner

Got pool questions, Get answers!  
Submit questions to "Dear Brad" [dearbrad@gmail.com](mailto:dearbrad@gmail.com)  
Look for answers every month in the newsletter

## July Calendar

July 2, Officer Meeting  
July 4, INDEPENDENCE DAY  
July 17, Member Meeting  
August 6, Officer Meeting  
August 21, Member Meeting



### Officers:

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### Pool Quiz results

1. d – all the above is acceptable
2. a – pH
3. a – corrosion
4. b – false
5. a – true
6. a - true

### "Funny Stories" Baseball

A recent Scottish immigrant attends his first baseball game in his new country and after a base hit he hears the fans roaring run....run! The next batter connects heavily with the ball and the Scotsman stands up and roars with the crowd in his thick accent: "R-r-run ya bahstard, r-run will ya!" A third batter slams a hit and again the Scotsman, obviously pleased with his knowledge of the game, screams "R-r-run ya bahstard, r-r-run will ya!" The next batter held his swing at three and two and as the ump calls a walk the Scotsman stands up yelling "R-r-run ya bahstard, r-r-run!" All the surrounding fans giggle quietly and he sits down confused. A friendly fan, sensing his embarrassment whisper. "He doesn't have to run. he's dot four balls."