VOLUME 26 | NUMBER 12

WE&T

water environment and technology

WEFTEC® report

Aeration

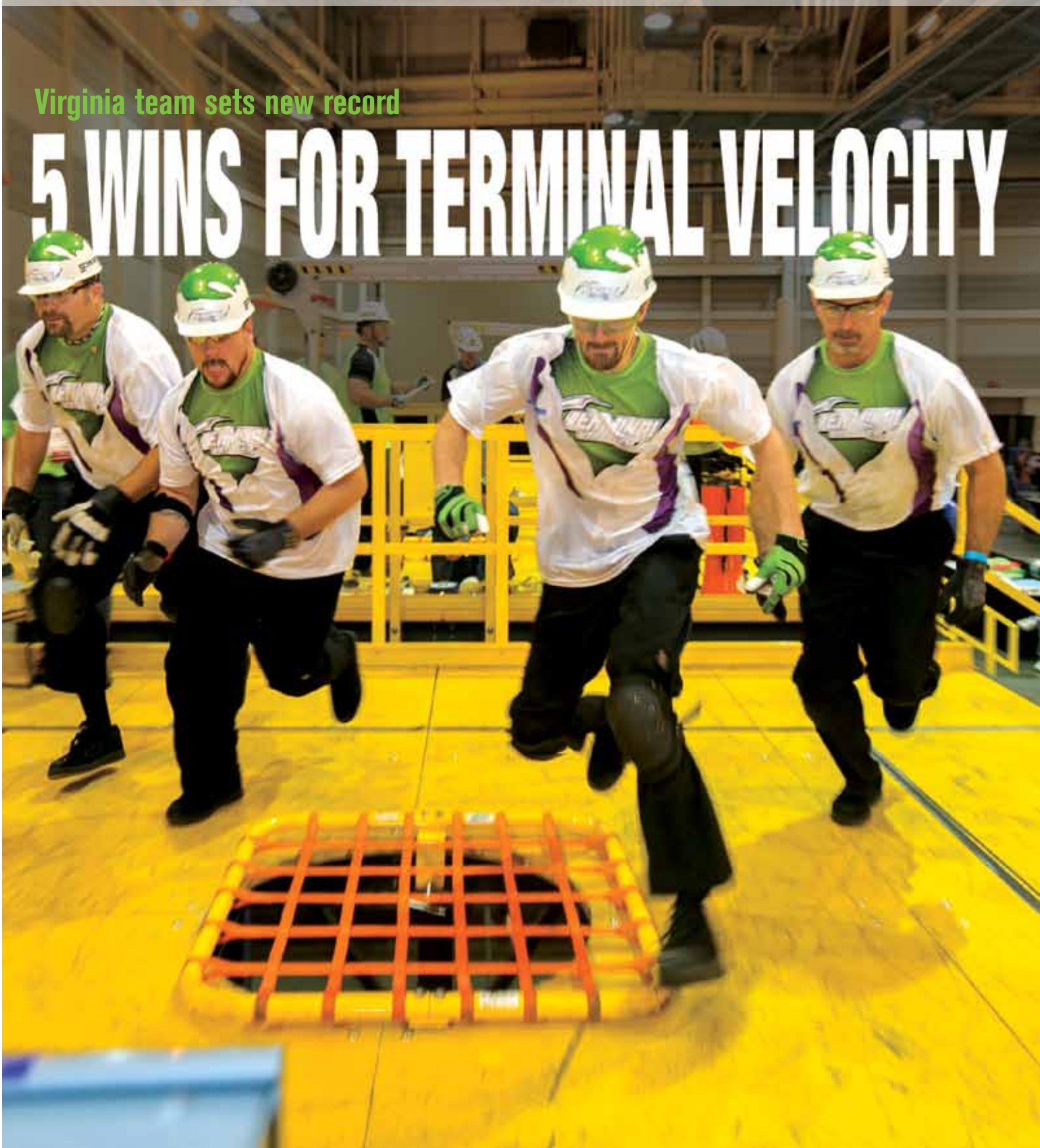
Energy generation

Biosolids & residuals

December 2014

Virginia team sets new record

5 WINS FOR TERMINAL VELOCITY



WE&T

DECEMBER 2014

27th Annual

OPS CHALL

- Terminal Velocity earns record-setting fifth-consecutive Division 1 win, p. 50
- Team HRSD hits its stride with second-consecutive Division 2 win, p. 54
- Laboratory judge commits 25 years to the competition, p. 56
- Full results and event descriptions, pp. 60-65

Jennifer Fulcher with Steve Harrison

ENGE 2014

Keiffer Photography

TERMINAL

EARNS RECORD-SETTING, FIFTH CONSECUTIVE DIVISION 1 WIN

VELOCITY

Jason Truitt and Steve Poe, Terminal Velocity team members, attach a suction hose during the Godwin Maintenance Event.
Kieffer Photography

Terminal Velocity huddled together to share some final words before starting their final event at Operations Challenge 2014. The team members separated and lined up at the entrance to the Collection Systems event. With a deep breath, team captain Donnie Cagle signaled the start. Moving with speed and precision, each member intensely focused on accomplishing his tasks. The team finished the event so quickly that it left the audience in awe.

With another remarkable performance, the Virginia Water Environment Association team made history by placing first in Division 1 for the fifth consecutive year.

"All the nervous energy … you just have to be able to channel it and focus when you have to," Cagle said. The team – Cagle, Steve Motley, Steve Poe, Jason Truitt, and coaches Elijah Smith and Bobby Williams – placed first in the Collection Systems event and second in all the others.

"Our biggest challenge this year was getting here," Cagle said. "We thought we were going to have to drive." Chicago airport problems led to a canceled connecting flight. The team had to drive 4 hours from Virginia Beach, Va., to fly out of Washington, D.C. "We're glad we made it," Cagle added.

Donnie Cagle, Terminal Velocity team captain, helps secure a first-place ranking both in the event and overall by opening the gate valve during the Godwin Maintenance Event. Keiffer Photography

Silver by a sliver

This year, the competition for first place in Division 1 was close. The TRA CReWSers finished close behind Terminal Velocity. The Water Environment Association of Texas team placed second overall by earning first in the Laboratory, Safety, and Godwin Maintenance events, and second in Collection Systems Event.

"The physical events are the ones that we always do well in," said Dale Burrow, TRA CReWSers captain. He attributes some of the team's success to a manager who is similar to a college football coach – he asks the team members to run events over and over until they get one of their best times, Burrow said. This helps the team, which includes Burrow, David Brown, Jake Burwell, Raudel Juarez, and coach Steve Price, develop the muscle memory needed to be successful, Burrow explained.

In addition to the networking, atmosphere, and ability to compete, Burrow enjoys learning new pieces of equipment. "We've gotten to see a lot of new equipment that we probably would have never seen," Burrow said. "It's a really good opportunity for us to get some real good experience on some new equipment."

TRA CReWSers Jake Burwell, David Brown, and Raudel Juarez work to attach a self-retracting lifeline during the Safety Event. Kieffer Photography

Jake Burwell secures a harness on the victim during the Safety Event, helping the TRA CReWSers earn first place in the event and second overall. Kieffer Photography

Redemption and retirement

The Commode Commandos edged out the remaining six Division 1 teams to take third. The Rocky Mountain Water Environment Association team, which includes Brian Pritekel, Caleb Vannice, Chong Woo, captain Stacey Walker, and coach John Wright, also placed third in both the Laboratory and Collection Systems events.

"We were excited about the pump event and did it penalty-free. We also were excited for the Lab event since it didn't go so well for us in 2013, and we managed to take third place this year," Walker said. This year the team's achievements come as three of the members prepare to retire from the team. It makes for a "bittersweet competition," Walker said.

The team began practicing early in the year to prepare for the regional New Jersey Water Environment Association Spring Fling competition where they placed first overall, Walker said.

"The teams are only getting faster at the events each year, and since we're a competitive bunch, we want to be as prepared as possible," she explained.

Participating in the competition, especially by studying for the Process Control Event, has helped the team gain a better understanding of how wastewater treatment facilities work. "We learn about the different tasks associated with wastewater treatment such as collections and laboratory; we learn how to work well together as a team, maximizing everyone's unique strengths and working as efficiently as possible; and lastly, we make a lot of great friends each year," Walker said.

Commode Commandos Caleb Vannice and Stacey Walker work on the 25-minute Process Control test. Kieffer Photography

Team HRSD hits its stride with second-consecutive Division 2 win

Team HRSD member Bobby Heath completes bench sheet and member Kevin Hafner determines dissolved oxygen concentration during the Laboartory Event while Laura St. Pierre looks on as a judge for the event. Kieffer Photography

As Team HRSD stepped up to the Godwin Maintenance Event, the audience shuffled closer to catch a glimpse of the team in action. Many held up cameras, phones, and tablets to record the performance and time the event. Like newly greased gears, the team completed each step of the event in perfect sync.

"When a team comes together … it is cohesion and everybody starts to enjoy themselves," said Tim Scott, captain of Team HRSD. "When it becomes more of a one-man team, four individual working parts under one umbrella, that's when you know you've got it right – win or lose."

Practiced unison

In addition to its own state event, the Virginia Water Environment Association team also traveled to three regional competitions. "You practice alone for the most part. You get to go to an event, you get to do it in front of an audience, and somewhat simulate what it's going to be like," Scott said. To prepare for these compeitions, the team began preparing in February. The practice paid off when the team secured first place in Division 2. It also earned second place in both the Godwin Maintenance and Collection Systems events, and third in the Safety Event.

The River Rangers – Brett Laney, Chris Carsner, Justine Abrook, and Kevin Wegener – work together to complete all the steps of the Laboatory Event. Kieffer Photography

"The biggest part of this is keeping a positive attitude, an open mindedness to try something new," Scott said. This year the team, which includes Scott, Kevin Hafner, Bobby Heath, Andrew Keisel, and coach Jason Hobor, consisted of two second-year competitors, one new competitor, and Scott, who originally served as coach, but had to step in to compete when another member had an injury, he said.

Even with the last-minute changes, the team worked to "play to each person's strengths" in each event, Scott said. "It's fun to redevelop a new team year after year, trying to get back to that same level of competition."

Rebuilding year after year

New this year, the Nevada Water Environment Association team, the Dumplings, achieved a notable second place win in Division 2. Brian Carlson, team captain, was the only team member with experience at the competition, having competed for the first time at WEFTEC® 2013. Carlson returned home and began recruiting others to join the new team. He emphasized the need to commit to practicing and continually working on improving performances, he said.

"It gets pretty intense, but we always emphasize: Make sure you're having fun," Carlson said. The team, which includes Carlson, James Koloskie, David McBride, Rita Smith, and coach Rick Anaya, also placed first in the Safety and Collection Systems events. Each member takes on the role of captain for a specific event, so the team can utilize each person's strengths, he explained.

"I think [Operations Challenge is] an opportunity for operators to feel like they can actually have input into something," Carlson said. He became inspired to compete by a trophy case that holds competition awards that veterans at his facility have won in the past. "It just sounded like a lot of fun, and I had a lot of respect for the guys that have done it," he explained.

Cross training

The River Rangers, a Pacific Northwest Clean Water Association (CWA) team, attributes its third-place win in Division 2 to the strategy of "practice, analyze, adjust, repeat," said Justine Abrook, team coach and captain. The team members, who include Abrook, Chris Cansner, Brett Laney, and Kevin Wegener, come from operations and maintenance backgrounds.

"By working side-by-side with different trades, we have been forced to go outside of our normal day-to-day," Abrook said. "We get to see and understand what other departments do and how we all work together to accomplish the end goal: clean water.

In addition to third place overall, the team placed second in the Safety Event. During practices, the team tries to run through all the events at least once and stay up-to-date on any changes. "We check for updates to the rules once a week and review the Rocky Mountain Water Environment Association website for questions and answers," Abrook said.

The team also tries to train with the Poo Fighters, another Pacific Northwest CWA team, at least twice every year. "This benefits both teams in several ways," Abrook said. "One, we get to use slightly different tools and equipment; and two, we get to compete against and learn from each other."

Rich Weigand, judge for the Laboratory Event, ensures no air is entrained in biochemical oxygen demand bottles. Kieffer Photography

Laboratory judge commits 25 years to the competition

Richard Weigand has judged Operations Challenge for 25 years. Primarily he has volunteered for the Laboratory Event, but he also has judged the Safety and Process Control events.

The Laboratory Event brings unique challenges, Weigand said. "There are four Laboratory judges that watch literally every move that they make," Weigand said. "There are many, many, many details that we follow … you really have to get in there close," he added. Unlike the other events, this event requires that teams follow very specific steps and make precise measurements, which often are hard to see, he explained.

Each Laboratory Event judge has a separate checklist of about 25 things to look for that contribute to the team's final score. Because competitors move so quickly, the judges must be diligent to make sure competitors thoroughly complete each step, Weigand said. The hardest part of judging this event is striving to be consistent and keeping track of the details, he said.

The most important thing about judging is to be consistent from team to team and table to table, Weigand said. If he has any questions, he asks the corresponding judge at another table. This keeps the judging consistent not only at his table but also across all of the tables, he said.

Before coming to the national competition, judges must be up-to-speed with the current technology and be well-versed in the requirements for the event. On competition day before the event begins, all Laboratory Event judges meet to hear the head judge explain any changes.

Judges receive assignments to both their table and judge number, which includes the list of steps to track during the competition. Then judges check that the tables are ready.

This year, 11 teams competed at Weigand's tables. Once the event starts at 11 a.m., it is nonstop activity until the competition is over, Weigand said. When a team completes the event, the judges complete and turn in their notes in to be calculated by other volunteers, catch their breath, clean up, and exactly reset the table for the next team – "so there's no advantage," he explained.

During the last 25 years, the competition always has drawn a big crowd, but there have been some recent changes. This year's event featured new equipment, and now everyone has a camera. This adds an element of distraction not only for the competitors but also for the judges, Weigand said. He makes sure to hold the score sheets close, so none of the cameras can catch his notes, he added. Also, more teams have corporate sponsors. "They look like NASCAR teams with matching jumpsuits, hats, helmets, and gloves," Weigand said.

Weigand appreciates Operations Challenge because it recognizes operators who are "the real nuts and bolts of wastewater," he said.

Working in harmony, TRA CReWSers – David Brown, Dale Burrow, and Raudel Juarez – attach the saddle in Collection Systems Event. Kieffer Photography

Veteran TRA CReWSers captain moves on to a different role in the competition

Dale Burrow first heard the term *Operations Challenge* in 1995 when his manager volunteered him to compete on a Water Environment Association of Texas team. "After I actually saw what it was all about, I was excited about it," Burrow said. "I thought it was a really neat program."

This year marked the TRA CReWSers team captain's final competition. "It's about the camaraderie; it's about watching somebody else run and seeing what their time is and trying to get out there and see if you can do it a little bit better," Burrow said. "I'm going to miss that. More importantly, I'm going to miss all the guys, all the friends that I've made."

Burrow remembers getting excited about the competition the moment he first saw it in action. His 1995 team members were all first-timers, and no one knew what to expect. "We were mismatched. We didn't look like any of these teams that are here [at WEFTEC®]," Burrow said. "But the next year we really geared up and we had nice shirts and we had practiced," he said.

The team made it to the national competition in 1996. "When we actually went to nationals for the first time, we were very much blown away," Burrow said. The teams attending were the best of the best, and the scale was much larger. It was somewhat intimidating, he said. But Burrow stayed on the team, which has become one of the top contenders every year.

Burrow's favorite competition memory occurred during WEFTEC 2005 in Washington, D.C., when the team placed first in Division 1 for the first time. "It was just a great experience all the way around," Burrow said. During the awards ceremony, other teams had a feeling the team had won, making it the first Southern team to win the division, Burrow said. "Everybody in the crowd just started chanting 'Texas, Texas.' It was really great," he said.

Burrow hopes to move into a new role that allows him to promote and build Operations Challenge in Texas, he said. He is working to become a state coordinator so he can use his knowledge and experience to get more people involved.

"We've had a lot of trouble trying to get Operations Challenge teams for our state competitions," Burrow said. "I thought that I could do a pretty good job trying to drum up some new teams, and I'm hoping that I can really take it to that next level," he said.

Louisiana teams exemplify hospitality during a training event for the Argentina team

The Louisiana Water Environment Association's teams offered up world-renowned southern hospitality during WEFTEC® 2014. The teams leapt at the chance to host a training session for the BTR Equipo team from Argentina on Sept. 27.

Kevin Richard, coach of the LUS Cajuns, led the effort. On Sept. 24, the team loaded all of the equipment for the Safety, Godwin Maintenance, and Laboratory events into two trucks and a van, drove it 2.5 hours from Lafayette, La., to New Orleans, and set it up in preparation for the training event. The other Louisiana team, the Water Dawgz, set up the rig for the Collection Systems Event. "[We were] really trying to make sure that they were able to get a good practice in," Richard said.

The Louisiana teams also made sure to feed their visitors well. The LUS Cajuns picked up boudin and cracklin to serve for breakfast and spent 2 hours cooking jambalaya for lunch. When BTR Equipo arrived, the team spent the day going over all the steps in each of the four events and let the Argentina team practice. Because this marked the Water Dawgz's first national competition, the day provided them with another opportunity to practice, Richard said. "We were training both teams in this process," he explained.

"It was a success. I think we got a lot out of it," Richard said. The training helped all teams involved and brought the LUS Cajuns together. "We did it as a team," he added.

The Argentina team was extremely appreciative. "They were so happy that we did this … we were getting hugs left and right," Richard said. "You can tell they really listened and they watched us," he added.

"We were received very well. We appreciate the support and the help we were given, and we're very grateful … in particular, the food that we were given," said Gustavo Meola, BTR Equipo team captain.

"The whole fellowship of the day … it made it worthwhile," Richard said. To complete the training, BTR Equipo gave the teams their hats, and the LUS Cajuns gave the Argentina team goodie bags containing their team's shirts and gumbo seasoning, he explained. "We had a good time," he said.

LUS Cajuns Chad Richard, Jermal Williams, and Kevin Richard complete each of their tasks during the Godwin Maintenance Event. Kieffer Photography

AIDIS BTR Equipo team members Leonardo Moreira, Norberto Morales, Gustavo Meola, and Nahuel Maldonado work together to complete the Safety Event. Kieffer Photography

Argentina team prepares for Operations Challenge in New Orleans

BTR Equipo, the Interamerican Sanitary and Environmental Engineering Association (AIDIS; Buenos Aires, Argentina) team, represented Argentina at WEFTEC® 2014.

Every 2 years, AIDIS holds a water sector event called Olimpiadas Sanitarias, in which teams compete and the winner is invited to compete at WEFTEC. This year the winning team, BTR Equipo, traveled to New Orleans to compete.

"Our whole goal and objective was to do our best and try to win the competition," said Gustavo N. Meola, BTR Equipo team captain. He works for Agua y Saneamientos Argentinos S.A. (Buenos Aires, Argentina).

The Argentinean event features different equipment and tools as well as an entirely different atmosphere, Meola explained. "It seems like here, there are more people who understand how important the events are and give more attention to the Operations Challenge event," Meola said.

To prepare for the U.S. competition, BTR Equipo team members only practiced for the Collection Systems Event because they did not have access to the tools or equipment used in the other events. Before traveling to New Orleans, the team prepared by reading and trying to understand the event procedures and assigning each member tasks to match his comfort zone, Meola said.

The two teams from the Louisiana Water Environment Association, the LUS Cajuns and the Water Dawgz, helped train the Argentina team on Sept. 27. The training provided BTR Equipo with the opportunity to practice the Godwin Maintenance, Safety, and Laboratory events for the first time. "We were able to practice with the equipment that is used here," Meola said.

Participating in both the Argentina and New Orleans competitions has helped BTR Equipo team members improve their career skills. And working as a team has been the most enjoyable aspect, Meola said. "We've learned a lot of things [from the competition]," he added.

Keiffer Photography

RESULTS

OVERALL

Division 1			
Place	**Team**	**Member Association**	**Final Score**
1	Terminal Velocity	Virginia WEA	459.16
2	TRA CReWSers	WEA of Texas	444.54
3	Commode Commandos	Rocky Mountain WEA	377.33
Division 2			
Place	**Team**	**Member Association**	**Final Score**
1	Team HRSD	Virginia WEA	455.36
2	Dumplings	Nevada WEA	449.21
3	River Rangers	Pacific Northwest CWA	444.09

SAFETY

Division 1		
Place	**Team**	**Member Association**
1	TRA CReWSers	WEA of Texas
2	Terminal Velocity	Virginia WEA
3	Blue Ridge Brawlers	Virginia WEA
Division 2		
Place	**Team**	**Member Association**
1	Dumplings	Nevada WEA
2	River Rangers	Pacific Northwest CWA
3	Team HRSD	Virginia WEA

PROCESS

Division 1		
Place	**Team**	**Member Association**
1	LA Wrecking Crew	California WEA
2	Terminal Velocity	Virginia WEA
3	Blue Ridge Brawlers	Virginia WEA
Division 2		
Place	**Team**	**Member Association**
1	Force Maine	New England WEA
2	Volatile Solids	Ohio WEA
3	Shovelers	Central States WEA

LABORATORY

Division 1		
Place	**Team**	**Member Association**
1	TRA CReWSers	WEA of Texas
2	Terminal Velocity	Virginia WEA
3	Commode Commandos	Rocky Mountain WEA
Division 2		
Place	**Team**	**Member Association**
1	Shovelers	Central States WEA
2	Mixed Liquors	Arkansas WEA
3	Royal Flush	WEA of Utah

COLLECTIONS

Division 1		
Place	**Team**	**Member Association**
1	Terminal Velocity	Virginia WEA
2	TRA CReWSers	WEA of Texas
3	Commode Commandos	Rocky Mountain WEA
Division 2		
Place	**Team**	**Member Association**
1	Dumplings	Nevada WEA
2	Team HRSD	Virginia WEA
3	Union County Sewer Rats	North Carolina WEA

GODWIN MAINTENANCE

Division 2		
Place	**Team**	**Member Association**
1	TRA CReWSers	WEA of Texas
2	Terminal Velocity	Virginia WEA
3	Jersey Devils	New Jersey WEA
Division 2		
Place	**Team**	**Member Association**
1	Royal Flush	WEA of Utah
2	Team HRSD	Virginia WEA
3	Volatile Solids	Ohio WEA

PROCESS CONTROL EVENT

EQUIPMENT/ RESOURCES

- Pencils
- Nonprogrammable calculators
- Test packets with answer sheet forms
- Team members

INSTRUCTIONS

- Start with a 5-minute review of the test to examine all the questions and point values.
- Return all pages to the test envelope in any order.
- Answer multiple choice questions; short math questions with multiple choice answers; and up to five operational type scenarios, each with four to six questions that may require considerable calculations. ▲
- Finish all portions of test in the remaining 20 minutes.
- "Teams are given the opportunity to provide as many correct answers as they can in the allowed time," according to the event's instructions.

LABORATORY EVENT

EQUIPMENT/RESOURCES

- 500-mL sample
- 200-mL GGA standard
- 300-mL seed material
- 3-L dilution water
- pH meter and probe
- Dissolved oxygen meter
- Pipets (transfer and volumetric) and bulbs
- Graduated cylinder
- Beakers
- 300-ml biochemical oxygen demand (BOD) bottles, stoppers, and caps
- Worksheets
- Sharpie® markers
- Squirt bottles

INSTRUCTIONS

- Determine sample pH using pH meter and probe.
- Rinse all BOD bottles with dilution water.
- Number BOD bottles according to worksheet.
- Prepare blank by filling a BOD bottle with dilution water.
- Plant sample dilutions in BOD bottles using pipets and graduated cylinder.
- Plant GGA standard in BOD bottle using volumetric pipet.
- Add seed material using pipet to sample and GGA bottles.
- Fill BOD bottles with dilution water.
- Calibrate dissolved oxygen meter.
- Use dissolved oxygen meter to determine dissolved oxygen concentration and record it in mg/L for each BOD bottle.
- ◀ Top off bottles with dilution water using squirt bottle and add a stopper without entraining air to each bottle.
- Add additional dilution water over the stopper and place plastic cap over each bottle.
- Ensure neither bubbles nor entrapped air are present in any of the bottles.
- Obtain dissolved oxygen concentration readings for each bottle and calculate blank result, seed correction, GGA standard results, and sample results.
- Calculate results for the worksheet provided.

Photo courtesy of Kevin Fitzpatrick Photography

COLLECTION SYSTEMS EVENT

EQUIPMENT/RESOURCES

- One 114-mm (4.5-in.) hole saw and bit brace
- Two 457-mm (18-in.) polyvinyl chloride saws
- Two 1.8-m (6-ft) lengths of 1.8-m (6-ft) SDR35 pipe
- Two Fernco Inc. (Davison, Mich.) couplings
- One 102-by-203 mm (4-by-8 in.) GPK Products Inc. (Fargo, N.D.) saddle connection
- Six pipe clamps
- Six National Association of Sewer Service Companies (Marriottsville, Md.) Pipeline Assessment and Certification Program pipe defect images

INSTRUCTIONS

Prepare repair section of pipe and install saddle connection.

- Remove damaged section of pipe.

Install replacement length and secure with flexible couplings and pipe clamps.

- Identify and categorize pipe defects.
- Pressure test and evaluate integrity of repair for 30 seconds.

GODWIN MAINTENANCE EVENT

EQUIPMENT/RESOURCES

- Godwin (Bridgeport, N.J.) Dri-Prime NC80 102-by-76 mm (4-by-3 in.) trailer-mounted pumpset
- Lift station skid
- Suction and discharge hoses
- Level transducer
- PrimeGuard control panel
- Vacuum pad and gauge

INSTRUCTIONS

- Service engine by replacing oil, fuel, and air filters.
- Service pump, which includes servicing the Venturi assembly, ejector housing, and nonreturn valve.
- Inspect the trailer.
- Connect battery, program PrimeGuard panel, and perform vacuum test.
- Isolate power source, level pump, and attach discharge and suction hoses.
- Program level transducer, open gate valve, and secure manhole opening.
- Return to designated start and indicate completion.

SAFETY EVENT

EQUIPMENT/RESOURCES

- Reid Lifting (Chepstow, Wales) Rapide Gantry
- DBI/Salalift II winch
- Ultra-Lok self-retracting lifeline (SLR)
- Scott Safety (Monroe, N.C.) Protégé gas monitor
- 2 ExoFit vest-type harnesses

INSTRUCTIONS

- Test confined space for hazardous gases.
- Attach gas monitor to entrant.
- Deploy gantry as well as attach winch and SRL.
- Ventilate space.
- Descend and apply harness to victim.
- Extract victim, and extract entrant.
- Disassemble gantry unit.
- Revive and decontaminate victim.
- Return to designated start and indicate completion.