

Virginia Team Wins Operations Challenge '96

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FINISHING

# First



► Surface Aerator Design    ► Understanding Activated Sludge

# Meeting the

In a little more than 45 minutes, a team of four operators repaired a pump, changed a valve in a hazardous confined space, installed and programed a flowmeter and sampler into a sanitary sewer pipe, performed three laboratory procedures, and solved 29 process control problems. By doing more than full day's work quicker, safer, and better than anyone else, Team HRSD "G" Force from the Hampton Roads Sanitation District in Virginia became "The Best Wastewater Treatment Plant Operators in the World."

The ninth annual Operations Challenge, held at WEFTEC'96 in Dallas,

Texas, Oct. 7-8, put 38 teams divided into two divisions to the test. The challenge, established in 1988, consists of five events—process control, laboratory, safety, pump maintenance, and collection systems.

Teams are timed and assessed penalties for errors, including incorrect answers or inadequate safety procedures. While all the teams participate in the process control event at the same time, teams rotate

through the other four events on the second day. When not competing, teams are intent on watching other competitors, presumably hoping to notice a better way to accomplish a task.



# Challenge

Operators show who's best at Operations Challenge '96

**The Genessee (N.Y.) River Raiders isolate and repair a plunger pump during the pump maintenance event.**

## Process Control

The challenge began with a timed exam, which tested each team's knowledge of process control scenarios. The exam consisted of a 25-question multiple-choice test covering wastewater treatment process control techniques and three operational problems.

According to event coordinator Bruce McDaniel, a utility manager from Fairmont, W.Va., the questions were taken from the Certification Quiz department of *Operations Forum* and is similar to a state certification test. This is the only event held on the first day of the competition.

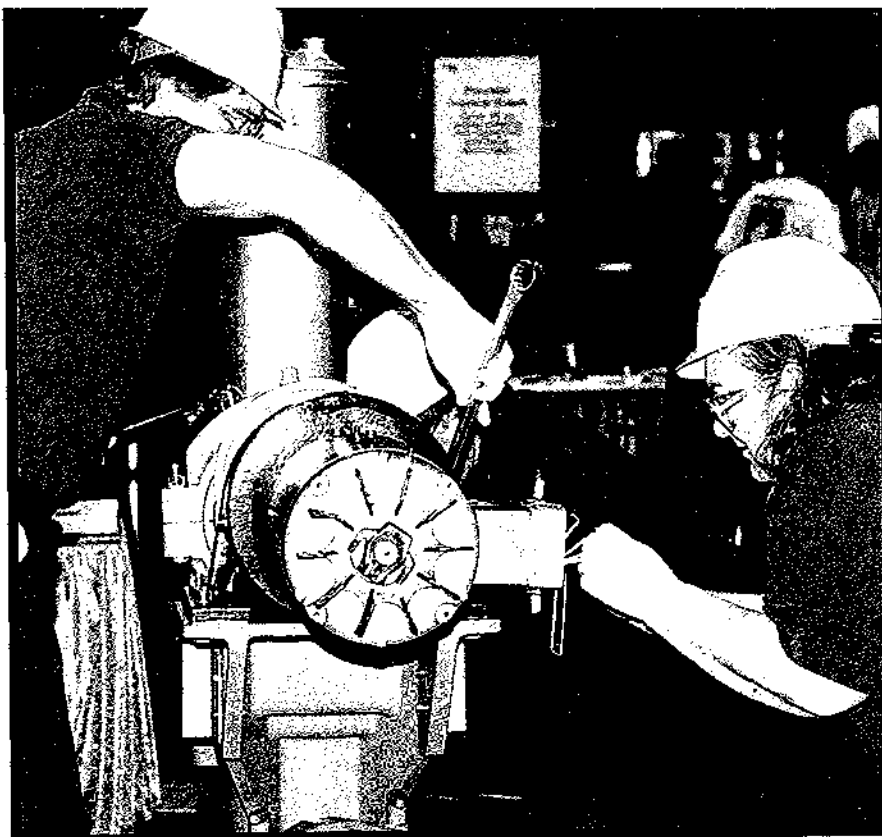
## Laboratory

The laboratory event required teams to measure a chlorine residual, take a field dissolved oxygen reading, and calibrate a pH meter and run a sample. Teams were notified of 10 laboratory procedures that could be used in the event one day before it started and told the day of the event which three procedures would be part of the competition.

According to event coordinator Charlene Givens of Givens & Associates Wastewater Co. Inc. in Cumberland, Ind., this year's laboratory event was geared more toward operators. In the past, teams might have recruited a lab technician as part of the team in order to score well in the lab event, she said. This year, according to Givens, event coordinators tried to make it more exciting for operators by using simpler equipment that they are familiar with, like a dissolved oxygen probe.

## Pump Maintenance

The maintenance event tests operators' skill in fixing a plunger pump. Safety, as always, is a concern, and teams first had to lock out the electrical part of the pump. Next, teams were re-



quired to completely close the pump's suction and discharge valves. Once this was done, the discharge ball and seat, valve seat gasket, and valve cover o-ring had to be replaced. Teams also

used an operations and maintenance manual to adjust the pin setting to pump a predetermined number of gallons per minute and to torque the eccentric nuts to pump at a selected dis-

### Top 10 Overall—Division I

| Team (Member Association)                   | Points |
|---------------------------------------------|--------|
| Team HRSD "G" Force (Virginia)              | 481.10 |
| L.A. Wrecking Crew (California)             | 434.55 |
| Team GRU (Florida)                          | 421.40 |
| Connisewer (Arkansas)                       | 413.46 |
| Harrisburg Precision Express (Pennsylvania) | 410.36 |
| Commode Commandos (Rocky Mountain)          | 397.13 |
| Synergetics (New England)                   | 396.34 |
| Austin Blues (Texas)                        | 343.87 |
| Prime Pumpers (Rocky Mountain)              | 334.65 |
| Sacramento Wastewater Warriors (California) | 333.70 |

### Top 10 Overall—Division II

| Team (Member Association)           | Points |
|-------------------------------------|--------|
| Cream of the Slop (Ontario)         | 466.15 |
| Humber Aerobics Club (Ontario)      | 463.13 |
| Wrepresentatives (Indiana)          | 431.16 |
| Scarabs (Michigan)                  | 417.97 |
| Ocean City Tiderunners (Chesapeake) | 410.99 |
| Critical Element (South Carolina)   | 399.12 |
| Maumee River Raiders (Ohio)         | 398.55 |
| 24 Hour Composites (California)     | 396.59 |
| Mt. Holly Cyclones (New Jersey)     | 396.18 |
| Avis Fecalis (Virginia)             | 396.01 |

**Canada's own Cream of the Slop from Ontario placed third in the safety event but first overall in Division II.**

charge pressure. Teams also had to re-install the pump guard; locate and replace defective fuses; rewire the motor; and bring the pump online by replacing the motor fan guard, closing the drains below the air chamber, opening the suction to pump from the clarifier or thickener and discharge valves, and removing the lock-out tags.

Penalties were assessed for not disconnecting the power, improperly tagging out items, loose screws and nuts, incorrect torque setting or gauge readings, and wrong voltage wiring or pin settings, among other things. Teams completely tore down, repaired, and brought the pump on-line while following numerous safety procedures in five to nine minutes.

### Collection Systems

The collection systems event required teams to determine how long it would take for a basement to flood if

pumps to a sanitary sewer were shut down. During the competition, flows in the pipe varied between 8 and 11 gpm.

To determine the flow rate, teams had to solve a written problem before they could accurately program a flowmeter and sampler. The problem required the teams to calculate the slope and size of the pipe before programming the equipment.

After drilling a 3-inch hole in the pipe, teams inserted the sampler suction line and the flowmeter insert into the pipe. Judges then connected a printer to the sampler to get a readout. Judging was based on how well the

teams programmed the equipment to get the correct information described in the written problem.

### Safety

This year's safety event was one of the most comprehensive held during Operations Challenge. The event tested each team's ability to enter a hazardous confined space to fix a leaking valve. Each team had to be knowledgeable about lockout/tagout procedures, respiratory protection methods, gas monitoring requirements, confined space entry permitting procedures, and personal protective equipment use.

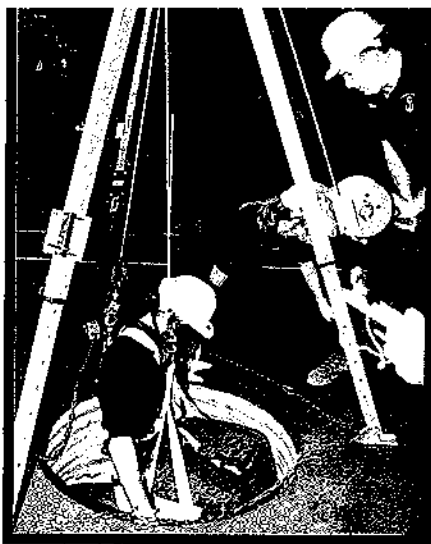
The event required two team mem-

### "G" Force Knocks Out Wrecking Crew for Division I Title

Team HRSD "G" Force from the Hampton Roads Sanitation District in Virginia unseated the 1995 Operations Challenge champions—the L.A. Wrecking Crew from California, who have won the competition for three years in a row. Since the inception of the competition in 1988, the Division I title has gone to a team from either Virginia or California.

Although the Wrecking Crew placed second overall this year, "G" Force was able to win three of the five individual events—process control, safety, and pump maintenance. The Wrecking Crew won the laboratory event.

According to "G" Force coach George Gregory, the team, whose members have been competing together for four years, practices about four hours per week, starting 10 weeks before the event.



**Members from the Humber Aerobics Club from Ontario, Canada, test their skill during the process control event, which consisted of 25 multiple-choice questions and three operational problems.**

## Canada's Cream of the Slop Wins Division II

"We came to the event looking for a top 10 finish," said Stewart Symes, a member of the Cream of the Slop team from the Regional Municipality of Ottawa-Carleton, Ontario, Canada. Instead the team became the first from a country other than the United States to win an Operations Challenge title. The Humber Aerobics Club team, also from Ontario, Canada, placed second in Division II.

Because it was their first appearance at an Operations Challenge, Cream of the Slop members didn't know what to expect, Symes said. Although event judges had to provide metric conversions for some of the test questions, the Canada teams had no trouble competing against the U.S. teams. In fact, the Canadian teams were the only ones that were not assessed a penalty in the safety event, according to Operations Challenge judges.

It shows that there are really no borders, Symes added.



**Division II winners, Cream of the Slop (left to right: coach Russell DeWitt, Mark Johnston, Melodie Hobbs, Francis Tavenier, and Stewart Symes)**

bers to test the manhole with a gas detection device and complete a confined space entry permit. The two other team members stepped into full-body harnesses and performed fit testing of the self-contained breathing apparatus. Members then rigged a tripod and winch with life lines and a boatswain's chair over the manhole. After two entrants were lowered into the manhole, they shut, locked, and tagged all the valves. The faulty air release valve was removed and replaced; the pressure relief valve was placed in the operational mode; operating valves were unlocked, untagged, and opened; and the entrants were removed from the manhole.

Before the event was finished, all equipment had to be disassembled. Most of the teams completed the event in about eight minutes.

In order to compete, teams must be sponsored by a Water Environment Federation Member Association or a recognized Operator Association, and all four team members must be members of the Water Environment Federation. More

than 120 teams competed in state and regional events to get to the final event, which is held each year at WEFTEC, the annual conference and exposition of the Water Environment Federation (WEF).

The competition is divided into two divisions. Usually, smaller municipalities and member associations or first-time competitors will compete in Division II. Division I teams are those that have placed in the top 10 in the previous year's Division I competition or in the top five in a Division I event; any returning team that placed in the top five overall in Division II in the previous year or in the top three in a Division II event; or any team that chooses to compete in Division I.

"All the teams practice on their own time, they are devoted to it," said Clarence Kuykendall, chair of WEF's Operations Challenge Committee and an operator at the Plum Island Wastewater Treatment Plant in South Carolina. "The better these guys are, the better their facilities operate and the better for the communities," he said.

**The Water Environment Federation wishes to thank the following companies for their donations to Operations Challenge '96:**

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# Operations Challenge '96

## Individual Event Results

### Process Control—Division I

| Team (Member Association)        | Seconds | Points |
|----------------------------------|---------|--------|
| Team HRSD "G" Force (Virginia)   | 539.63  | 100.00 |
| Connisewer (Arkansas)            | 543.97  | 99.58  |
| Team GRU (Florida)               | 583.38  | 95.75  |
| L.A. Wrecking Crew (California)  | 597.07  | 94.42  |
| Cincinnati Power Flushers (Ohio) | 699.00  | 84.53  |

### Process Control—Division II

| Team (Member Association)      | Seconds | Points |
|--------------------------------|---------|--------|
| Scarabs (Michigan)             | 769.43  | 100.00 |
| Tampa Eliminators (Florida)    | 867.04  | 94.03  |
| Wrepresentatives (Indiana)     | 887.71  | 92.76  |
| Humber Aerobics Club (Ontario) | 901.75  | 91.90  |
| Maumee River Raiders (Ohio)    | 945.62  | 89.22  |

### Laboratory—Division I

| Team (Member Association)                   | Seconds | Points |
|---------------------------------------------|---------|--------|
| L.A. Wrecking Crew (California)             | 565.92  | 100.00 |
| Team GRU (Florida)                          | 590.04  | 97.22  |
| Commode Commandos (Rocky Mountain)          | 598.91  | 96.20  |
| Sacramento Wastewater Warriors (California) | 660.89  | 89.05  |
| Synergetics (New England)                   | 675.49  | 87.37  |

### Laboratory—Division II

| Team (Member Association)       | Seconds | Points |
|---------------------------------|---------|--------|
| Wrepresentatives (Indiana)      | 652.25  | 100.00 |
| Humber Aerobics Club (Ontario)  | 697.67  | 95.25  |
| 24 Hour Composites (California) | 720.06  | 92.91  |
| Cream of the Slop (Ontario)     | 737.22  | 91.11  |
| Scarabs (Michigan)              | 767.55  | 87.94  |

### Pump Maintenance—Division I

| Team (Member Association)                   | Seconds | Points |
|---------------------------------------------|---------|--------|
| Team HRSD "G" Force (Virginia)              | 324.50  | 100.00 |
| Synergetics (New England)                   | 326.77  | 99.15  |
| Connisewer (Arkansas)                       | 382.15  | 78.36  |
| Thoroughbreds (Kentucky-Tennessee)          | 388.90  | 75.82  |
| Harrisburg Precision Express (Pennsylvania) | 394.85  | 73.59  |

### Pump Maintenance—Division II

| Team (Member Association)           | Seconds | Points |
|-------------------------------------|---------|--------|
| Cream of the Slop (Ontario)         | 377.01  | 100.00 |
| Maine Breakers (New England)        | 398.28  | 97.19  |
| Ocean City Tiderunners (Chesapeake) | 405.87  | 96.19  |
| Critical Element (South Carolina)   | 407.26  | 96.01  |
| Humber Aerobics Club (Ontario)      | 435.16  | 92.32  |

### Collection Systems—Division I

| Team (Member Association)                   | Seconds | Points |
|---------------------------------------------|---------|--------|
| Harrisburg Precision Express (Pennsylvania) | 430.01  | 100.00 |
| Commode Commandos (Rocky Mountain)          | 435.12  | 98.96  |
| Team HRSD "G" Force (Virginia)              | 446.18  | 96.70  |
| Team GRU (Florida)                          | 464.88  | 92.89  |
| L.A. Wrecking Crew (California)             | 469.00  | 92.05  |

### Collection Systems—Division II

| Team (Member Association)           | Seconds | Points |
|-------------------------------------|---------|--------|
| Cream of the Slop (Ontario)         | 435.25  | 100.00 |
| Mt. Holly Cyclones (New Jersey)     | 497.00  | 92.57  |
| Wrepresentatives (Indiana)          | 522.65  | 89.48  |
| OMI Renegades (Mississippi)         | 534.09  | 88.11  |
| Ocean City Tiderunners (Chesapeake) | 559.50  | 85.05  |

### Safety—Division I

| Team (Member Association)          | Seconds | Points |
|------------------------------------|---------|--------|
| Team HRSD "G" Force (Virginia)     | 395.90  | 100.00 |
| Team GRU (Florida)                 | 415.53  | 95.99  |
| Thoroughbreds (Kentucky-Tennessee) | 419.72  | 95.13  |
| L.A. Wrecking Crew (California)    | 464.16  | 86.06  |
| Connisewer (Arkansas)              | 473.31  | 84.19  |

### Safety—Division II

| Team (Member Association)          | Seconds | Points |
|------------------------------------|---------|--------|
| Humber Aerobics Club (Ontario)     | 422.22  | 100.00 |
| Urban Knights (Kentucky-Tennessee) | 495.33  | 93.41  |
| Cream of the Slop (Ontario)        | 504.64  | 92.57  |
| TRA CRWsers (Texas)                | 517.50  | 91.41  |
| Wrepresentatives (Indiana)         | 559.19  | 87.65  |