The Synergetics began preparing for the National Event in July, meeting once a week for two to four hour practice sessions. The early sessions focused on the Maintenance Event, attempting to perfect the techniques used on the Komline Sanderson Plunger Pump. The team was allowed to practice on the competition pump, thanks to the generosity of Komline Sanderson and to the efforts of the Massachusetts Water Resources Authority. A joint practice session was held with the Maine Crusaders. Each team gave advice towards improving each others performance.

Next, the team familiarized themselves with the ISCO 4230 Bubbler Flow Meter, the ISCO 3700C Sampler, and the ISCO 4200 Flow Meter insert for the Collection System Event. This was to be a surprise event, so little information was released on the exact procedure, therefore knowing these pieces of equipment thoroughly was essential for success.

Many people contributed their thoughts and direction during a few of the practice sessions. Thanks goes to Ed Savage and Norton True from Vermont, John Hart and the Maine Crusaders from Maine, and John Bush from NHDES.

Practice on the 10 possible Laboratory procedures, the Safety Event, and Process Control tests were interspersed with the Maintenance and Collection System Event practicing. Practicing continue through the final week before leaving for Miami. The team had given all that they could and felt that they would be able to give Miami Beach their best performance.

The team arrived in Miami on Saturday, October 21, after a turbulent flight from Manchester. They were checked into the beach front Delano Hotel along with the team from Maine. Miami Beach is a very different place than New England. Any style of dress was acceptable for men and women; the hotel room were very white, with white linens on most pieces of furniture; and interesting furniture in the lobby. The streets

Synergetics — Continued on page 4
Our Battle with Odors at the Nashua WTF
by Mark Bernier

FARTS – Where would we be without them? As children we learned that they were comical, everyone would giggle at the sound.

Some adults on the other hand, take great pride in letting them rip if the audience is just right. The jokes start flying, hands are flailing, lots of laughing and before you know it, the odor is gone (for the most part anyway). No problem, right?

The answer is wrong! – If you work at a wastewater treatment plant and that odorous gas sneaks into the neighborhoods yard and decides to linger there, as we well know in Nashua.

When the original primary treatment plant was built in 1960, our neighbors were few and far between. The flows were low, and the aroma of fresh cut wood from the lumber mill mixed nicely with fine country smells associated with the small chicken farm up the street. Life was good!!!

30 years later – the town is now a city with a lot of businesses and industries. Of course with this, comes new neighborhoods and new neighbors. In fact, some of our neighbors live within 100 yards of our grit chambers and primary clarifiers.

As the city grew, we did too!! What was once our back yard, is now a maze of buildings, roads, open tanks, and we can’t forget this one – ODORS!

The Nashua WTF serves a population of approximately 100,000 people from Nashua, Hudson and South Merrimack, averaging flows of 10.5 mgd with peak flows of 39 mgd, going through our fine bubble activated sludge process.

Odor complaints were logging in rapidly and we were losing our rapport with the neighbors. It’s time to take action. This was our approach:

IDENTIFY AND LOCATE THE SOURCES OF THE OFFENSIVE ODORS

This task was hired out to professional sniffers who had the costly equipment needed to compile an odor profile of our facility and direct us on possible upgrades needed to combat our problem.

BUILD A RELATIONSHIP WITH OUR NEIGHBORS THROUGH COMMUNICATION, TOURS, ETC.

The WTF and city officials got together with the residents and created an odor task force where both sides could remain informed on odor control projects and their effectiveness in the community.

IT’S MEETING TIME —

The staff got together with their suggestions along with those from the consultants and the task force and analyzed them for

Battle Odors — Continued on page 6

representatives from the Town to go to this event. Our sincere congratulations to Larry Spencer and his crew on this deserved recognition!

7.) The next Directors’ Meeting is scheduled for December 20, 1995 at the Franklin Training Center.
Congratulations to the Staff at the Merrimack WWTF!!
1st PLACE NATIONWIDE O + M EXCELLENCE AWARD
in Medium Secondary Category

1995 N.H.W.P.C.A.
Operator Exchange

by Mike Gootee

I was reading the article about the Operator Exchange Program in the June issue of "THE COLLECTOR". The article asked if you or anyone you know would be interested in experiencing new, wild and scenic places and visit a multitude of exotic wastewater facilities? I thought this would be a great opportunity to see how other facilities operate and possibly get some ideas that may help me at our facility, but I never did send in my name.

Then one day a member from the NHWPCA approached me and asked if I would be interested in being a participant in the Exchange Program with the Massachusetts WPCA. My answer was, "Yes", of course! I figured a little time away could only do me good. I'm so glad I made that decision, because it turned our to be a very memorable and educational experience.

Thanks to Celeste Valliere, President of the MWPCA, I received great accommodations at the Westminster Village Inn, along with great food and company for lunch and dinner.

My guide the first day was Dan Nolan of the MWPCA and Chief Operator at the Gardner WWTF. What a great host! Too bad I didn't bring my golf clubs. Our first visit took us to the East and West Fitchburg WWTF and the Gardner WWTF. All three (3) of these towns have a lot of industry and are primarily paper towns, even though most of them have shut down. In the short time I was there I sensed a great deal of operator experience with the many complex situations that occur on a daily basis.

My guide for the second day was Celeste Valliere. We toured the Veryline WWTF and the Lowell WWTF. There was quite a contrast between these two plants. The Veryline WWTF primarily dealt with waste from the apple and cranberry factory and some minimal domestic waste and only averaged around .5 MGD. The Lowell WWTF averaged 20 MGD and could take up to 90 MGD. This is a combined system so the spring and during heavy rainfall, the facility would take in to 70 MGD.

The third day I attended a Trade Show in Marlboro, MA. What a great turn out! I've never seen so many operators in one location, giving contact hours for attending the Trade Show really boosted the attendance.

Many thanks to Celeste, Dan and the MWPCA. It was a pleasure participating in the Exchange. Also, many thanks to the operators who took time out of their day to show us their facilities and the operators who took time from their personal lives in the evening to take me out for dinner. It was a pleasure spending time with all of you.

As for future Operator Exchange participants, I would strongly suggest sending in your name the next time you see the Operator Exchange article in "THE COLLECTOR". You will definitely learn something new and thoroughly enjoy yourself.

Many thanks to George and the NHWPCA.

Mass. Operator Exchange
by Brian Phillips

I would like to thank the New Hampshire Water Pollution Control Association for their involvement, support and funding of the Operator Exchange Program. I had three days of an interesting and informative learning experience with Keith Gilbert, Ed Rushbrook and Tom White. The three of them took me on tours of several treatment plants all in the Concord area.

On Tuesday, September 19, 1995 I was met at the Comfort Inn by Keith Gilbert and the two of us went to the Wastewater Treatment Facility in Concord. I was given a tour by the chief operator of the plant. I was most impressed with the gravity thickeners and the bio-cells because I was not familiar with either of these types of treatment processes. While touring the Concord plant I was introduced to Ed Rushbrook. He continued my tour by taking me to the wastewater treatment plant in Henniker where Ken Levesque gave us the tour while Mary Dowse did BOD's. Henniker is a small extended aeration plant and construction of the new septage receiving facility was the main activity. It was one busy place that day. Belt presses and UV disinfection were new treatment processes to me. On to Claremont, a medium sized wastewater treatment plant. For the first time I could actually see a working compost process. It was interesting because I have heard so much about this process and I finally got the chance to see it in action. The two of us drove from there back to my hotel where I would be staying for my two nights in New Hampshire. That evening I would be having dinner with the Directors of the N.H.W.P.C.A. at their annual dinner meeting. I was well received and talked about the days tours and the up-coming tours the next day.

On Wednesday I met Tom White at the Department of Environmental Services as had been arranged the previous night. Our first stop was the wastewater treatment facility in Ashland where Dave Brennan met us. Ashland is a medium-sized wastewater treatment facility that serves Ashland and one very large industry. The treatment process in Ashland included aerated lagoons, a treatment process that I have also read about but never was privileged to see in operation. Tom and Dave answered all my questions about this treatment process. On to Plymouth, a small treatment plant that had RBC's and composting. After lunch we arrived at Waterville Valley. A totally enclosed treatment plant that only processes 8 hours a day. This treatment plant had to deal with the seasonal changes in the flow which as an operator I could see how you had to keep on your toes.

Thursday must be Manchester. I was well received by the N.H.W.P.C.A. members. As part of their fall meeting, we toured the Manchester wastewater treatment facility. This large treatment facility had just completed an expansion with the help of the engineering firm of Camp Dresser & McKee. Manchester has fluidized bed incinerators which I found to be the high-light of my tour. After touring the plant the members continued their meeting over lunch. I was recognized at the meeting as the Massachusetts Exchange Operator for this year. After this luncheon I said my good-byes and headed south to Rt. 93...
were very safe to walk with many affordable shops and restaurants within walking distance. The WEFTEC conference center was also within walking distance, allowing the team some stress reduction/cohesion time before the various check-in times.

The Maine and New Hampshire teams attended the Process Control review session on Sunday. This class gives the attenders tips on solving problems as well as hints on what might show up on the competition exam. The review session was followed by presentations from various vendors of collection system flow metering and sampling devices. Information given during these presentations could be useful in the Collection System Event.

On Monday morning, the teams surveyed the competition area and sought out vendors of various lab and collection system equipment that was to be used in the competition. The Synergetics and Crusaders later attended the NEWA luncheon as guests. Immediately after lunch, the teams were transported back to the conference center for the pre-competition meeting. Here, team check-in occurs, T-shirts and caps are distributed to each team member and coach, last minute event changes are relayed, event questions are answered, and the competition schedule is released. By 6 p.m., all teams were dismissed to await the morrow with much nervous apprehension.

The Synergetics and Crusaders arrived back at their hotel, agreeing to meet at 7:30 p.m. for a relaxation period. The Synergetics went through a review of event procedures before moving on to the relaxation period. Charlene Powell guided the teams through the relaxation techniques, using yoga positions and breathing techniques to release built up tension. Both teams went away feeling a little more relaxed.

Tuesday morning, the Crusaders and Synergetics reported to the Operations Challenge at 8 a.m. Both teams were nervous, but ready. The Synergetics took a moment to prepare by stretching, OMing and receiving a power boost from the team's black marble. The Crusaders were the first to start, reporting to the Laboratory Event. The Crusaders fired out some last minute questions to the Synergetics and the Synergetics returned the answers, but were quickly cut off by a judge whom literally blocked the communication path until the teams quieted down. The Crusaders did well, with no penalties assessed for their performance. From this point on, the Synergetics were unable to match any more of the Crusaders events due to schedule constraints.

The Synergetics events were scheduled an hour and a half apart, giving the team just enough time to unwind from the previous event and then to prepare for the next. The team began with the Safety Event, scoring 141.66 seconds with no assessed penalties. Next came the Process Control Event which was completed in less than nine minutes. The Maintenance Event followed and their final score was 431.07 seconds with penalties included for two errors. The team went on to the Laboratory Event in which the whole team worked together to identify microorganisms, after which the team split up into pairs with one pair setting up seeded CBODs and the other calibrating a D.O. meter and reading out the D.O. of the CBODs samples. The team received a penalty in this event giving them a final time of 1137.35 seconds. Last but not least, was the collection system event. Using tips given to the team by the Crusaders, the team was able to program the flow meter and the sampler quickly. The insert device was installed quickly, as much of the work was already completed during the set up by the judges. The team went on to answer various collection system questions as well as four bonus questions. The team received all of the bonus points which deducted 80 seconds from their time, but received penalties for six incorrectly answered questions in the other section. The flow meter/insert and sampler set-up was error free giving the team a score of 1136.15 seconds.

The Synergetics were not finished with the competition until about 5:30 p.m., due to a long delay in the start time for the Collection System event, and the Awards Ceremony was scheduled for 6 p.m. The team was drained by the end of the
competition, so they took time to unwind and shower before the Awards Ceremony, showing up fashionable late (not the same as Ken Kessler late). The team dispersed, mingling with the other teams and friends.

The Certificate and Awards presentation began with an E.P.A. representative handing out Certificates of Appreciation, calling each team member by name. As an interesting aside: After Sharon Ostrander’s name was called out, a woman came up to her and asked if she remembered her. It was an old schoolmate and she was the wife of a member of Who Cares from California. You never know who you will meet at these events. Several Certificates for “Good Sportsmanship” and special Certificates for Hawaii and Arizona were presented.

Finally, the Event Awards presentation began and was conducted by Doug Miller. A change had been made from previous years, awarding a plaque for second and third place with a trophy awarded only to first place. The inclusion of a third place award allowed a wider variety of teams to be recognized for their actual achievements. The Synergetics received one of these third place plaques in the Safety Event.

After the Event Awards were presented, Doug Miller went into a long rendition of gobbly-gook to raise anticipation over the Overall Placement Awards. By this time the Synergetics felt a little down, believing that they had placed lower than the previous year. Finally, Doug Miller picked up the Third Place Overall Trophy and began his presentation speech. When he reached the words “New England” the Synergetics were dumbfounded. The team and coach walked up like elated zombies and formed a team huddle while Doug Miller held the trophy out to thin air! Eventually the team lined up to accept the trophy and for pictures. The Second and First Place Overall Trophies were again awarded to the Virginia HRSD and the California L.A. Wrecking Crew, respectively.

The Awards Ceremony ended with many teams exchanging congratulations for jobs well done. The Synergetics and the Crusaders were then whisked off to a celebration dinner which was hosted by many supporters of the Challenge Teams. The meal and conversation was great. The Synergetic’s Third Place Overall award was passed around the room for all to see. The teams black marble was then pulled out and displayed only to be temporarily lost on the floor. The floor was swarming with people on their hands and knees until the marble was found again. The Crusaders had a great time experiencing the whole thing with the friendly New England group.

The following morning, after the sunrise and/or phone had awakened a few unappreciative members, the team prepared to leave the warm and beautiful resort town. As all were gathered to catch a cab to the airport, George Laney returned from the Operations Challenge committee meeting that was held that morning. He explained that an error had been made in the posting of team times in the Collection System Event and that the Synergetics had actually won Third Place in this Event. This last bit of news was enough to put smiles back on all the team members faces as they departed from Miami Beach.

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**Table: Placement**

<table>
<thead>
<tr>
<th>Placement</th>
<th>Laboratory</th>
<th>Pump Maintenance</th>
<th>Safety</th>
<th>Process</th>
<th>Collections</th>
<th>Overall</th>
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<td></td>
<td>Fifth</td>
<td>Fifth</td>
<td>Third</td>
<td>Fourth or better</td>
<td>Third</td>
<td>Third</td>
</tr>
</tbody>
</table>

*There were 16 teams in Division 1*

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**Thanks To Our Sponsors For Our Success In 1995 Operations Challenge**

- ITT Flygt, Corporation
- New England Environmental Equipment
- Komline-Sanderson
- ARRC Safety Equipment
- Massachusetts Water Environment Association
- New England Water Environment Association
- Utility Pipeline, Inc.
- Anderson Livingston
- Dufresne-Henry
- Woodard & Curran
- Wright Pierce Engineers
- Mast Assoc.
- Operations Management International, Inc.
- Camp Dresser McKee, Inc.
- Hoyle, Tanner & Associates, Inc.
- Szerdip Price Brothers
- City of Nashua, NH
- Coca-Cola, USA
- NH Water Resources Division
- Town of Greenville, NH
- Town of Sunapee, NH
- Town of Warner, NH
cost, safety, maintenance and so on. Of the many ideas presented, cost seemed to be the major drawback, contractors don't come cheap. Can we tackle these projects ourselves? Of course we can!!

IT'S PROJECT TIME —

Primary treatment was identified as a significant odor source, so let's start there.

A. Grit Chambers

We covered the two (2) 26' x 34' structures using galvanized trusses and roof decking. We custom built a wet scrubber using 24" PVC pipe, re-circulation and chemical feed pumps and a variable speed fan capable of handling up to 1000 CFM. We have a 95% H2S removal from this system.

Contractor Estimate — $130,000
Our Cost — $ 16,000 (Savings of $114,000)

B. Primary Clarifiers

Primary Clarifiers consist of 5 rectangular tanks, an influent trough, an effluent trough and a scum trough with monorakes performing the mechanical tasks.

Influent Trough — Coarse sprayers using chlorinated plant water were set up throughout the length of the trough, using PVC pipe and hose sprayers going with different patterns to distribute the filtrate and floating solids more evenly throughout the tanks. This helped by eliminating buildup and also a quicker removal of floating solids from the clarifiers.

Clarifiers — Fine mist sprayers were set up also with plant water, to envelope the entire water surface area using PVC pipe headers with lawn type irrigation spray heads. This method has proven to be effective during the hot summer days in combating odors as well as settling a portion of the filtrate from the belt presses.

Cost for sprayers in both trough and tanks — approx. $1,900

These same sprayers were also used on the primary gravity thickeners!

Effluent Channel — Covers were built using pressure treated lumber and corrugated fiberglass panels.

Scum Trough and Apron — The covers built for these areas, utilize a pressure treated beam with aluminum framed hinged covers. The covering material is a corrugated plastic with urethane insulation attached to the underside. When originally designed, time saving was the major idea and if you've ever chopped frozen grease in the winter months — you'd know why. Old belts from our presses were used to contain odors on the water side.

(Old belts for sale — CHEAP! Need any?)

C. Chemical Additions

- Ferrous Chloride - ahead of wet well
- Ability to Pre-chlorinate - wet well and grit chamber
- Potassium Permanganate - sludge handling

D. Grease Pit

A simple, but effective solution was to fasten a tarp over the existing grating.

E. Process Changes

Maintain a low sludge inventory — Housekeeping and adjust pumping rates for less detention time in our 13 pump stations.

F. Sludge Storage Tanks

This proved to be the biggest job yet! The whole system was in need of help. There were leaks in the aluminum ducting that routed from the top of the 5 tanks into the process building, across the room and down one floor before reaching the existing, overworked, 26,000 CFM wet scrubber, which emitted the foul odor into the neighborhood, as well as filling the process building. Our thought was to isolate the strong odor concentration from these tanks from the process building exhaust and treat them with separate systems. The following steps had to be taken:

Step 1 — We replaced the outside aluminum ducting with PVC. This worked great in eliminating the leaks.
A/D INSTRUMENT REPAIR
Tom McPherson
(603) 382-4667

BOETTCHER ELECTRIC
INSTRUMENT & INDUSTRIAL
CONTROLS
Peter A. Boettcher
(603) 485-5977

DUFRESNE-HENRY, INC.
Richard Hertrich
(603) 669-8672

EASTERN ANALYTICAL, INC.
Cindy Juneau
(603) 228-0525
(800) 287-0525

EASTERN PIPE SERVICE, INC.
Robert R. Williams
(603) 889-0929

FREDERICKSEAL, INC.
Ronald Hoffman
(603) 668-0900

HOYLE, TANNER & ASSOC., INC.
Michael P. Nollin
(603) 669-5555

ITT LYGT CORPORATION
John Lord
(617) 935-6515

THE MAHER CORPORATION
Frederick Kibble/Paul Sussman
(617) 933-3210

NETCO—RESIDUALS MANAGEMENT
James S. Myers
(207) 698-7262

PRIMARY MEASUREMENTS, INC.
David R. Clark
(508) 746-4000

Q.C. SERVICES
Richard Schieferstein
(207) 583-2980

RED HED SUPPLY, INC.
John Groulx
(800) 639-9287

RIST-FROST-SHUMAY
ENGINEERING PC
Gary S. Whitten
(603) 524-4647

STEARNS & WHETER, INC.
William Hall, Jr.
(603) 622-5838

DAVID F. SULLIVAN & ASSOCIATES
Michael Sullivan
(508) 777-5552

THE H.L. TURNER GROUP
Susan S. Partch
(603) 228-1122

UNDERWOOD ENGINEERS, INC.
W. Steven Clifton, P.E.
(603) 436-6192

UTILITY PIPELINE SERVICES, INC.
George Harrington
(603) 625-1212

R.H. WHITE CONSTRUCTION CO., INC.
Edward Casey
(508) 832-3295

WHITE MOUNTAIN RESOURCE
MANAG., INC.
Shelagh Connelly
(603) 253-8418

WRIGHT-PIERCE ENGINEERS
Charles J. Martin
(207) 725-8721

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Step 2 – A 2 stage wet scrubber was installed with a chemical feed, recirculation, and also mist injection points. This gives us the flexibility for experimentation on each stage separately. The construction is now complete and we are now on the testing stage in hopes of refining operating procedures before the warm weather returns!

In closing, we as a group have made progress in the efforts to control odors without breaking the budget. Who knows, maybe we'll develop some new technologies down the road . . .
HWHPCA Winter Meeting

December 7, 1995
Sheraton Wayfarer, Bedford, NH

Schedule of Events

9:00 - 10:30  Odor Control — 3 Speakers
10:45 - 12:15 Contract Operations — 3 Speakers

*These two technical sessions you don’t want to miss!*

12:30 - 1:30  Buffet Luncheon
*Italiano Buffet*

1:30  NHWPCA Business Meeting
*President Keith Gilbert presiding*

*Gifts and cheer to be provided by “Santa Claus”*


HWHPCA
7TH ANNUAL SKI WEEKEND

February 2-4, 1996

The Stonehurst Manor, North Conway, NH will once again be the host of the 7th Annual NHWPCA Ski Weekend. Included in this weekend trip is 2 nights stay (Friday & Saturday Night), breakfasts, dinners, 8% sales tax, and a welcome to the slopes NHWPCA reception night (Friday).

Single standard rooms are $229 per couple, for the complete package, deluxe rooms are $272, deluxe rooms w/fireplace are $359 (gratuities not included). Send a $100.00 deposit to the address listed on the ticket before December 31, 1995. Rooms are limited - call me ahead to book a room - 603-594-3365

See you there. Thanks!!! - Rick

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Send Check to Rick Seymour, c/o Nashua WTV, Sawmills Road, Nashua, NH 03060

Name: ________________________________
Address: ________________________________
Phone: __________________ FAX: ___________________
Number Attending: ___________ Check #: ____________
Type of Room Required: ____________

Thomas White
NHWSPCD
1 Engel St.
Concord, NH 03301