

ShopTalk

Plant Operations Support Consortium

Volume 15, Number 2

Summer 2010

Tough Economy Prompts Innovation – Savvy Leaders Find Ways to Succeed

By Bob MacKenzie, Consortium Manager

The struggling economy has forced facility managers and trades personnel to adjust how

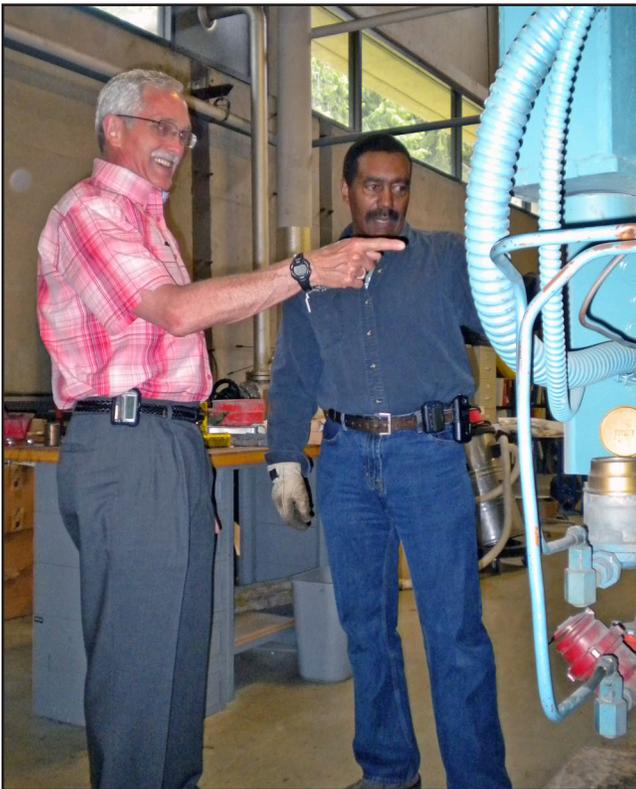
they carry out tasks and run operations. Many public agencies and educational facilities are

facing budget reductions that force cutbacks on hiring, and facilities are being run on bare bones resources. The phrase “doing more with less” has become “doing the norm with a lot less.”

Yet Consortium members are showing they are up to the challenge, implementing innovative strategies that have employees working smarter, while promoting creative thinking. Apprenticeship programs, workforce management, communication tools, and energy

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We’ve had to reevaluate our workload and figure out if something needs to come off the table.

Paul Smith,
The Evergreen State College



Paul Smith (left), director of facilities, and Ed Rivera, steam fitter, check a boiler at The Evergreen State College (TESC). The college will soon install digital controls so boilers can be restarted remotely if an unscheduled event takes them offline. This is just one strategy TESC has implemented to increase efficiency.

efficiency are among the strategies showing promise.

Preparing for Baby-Boomer Retirements

Mukilteo School District has encountered an ironic twist with the down economy. Although baby boomer trades personnel and managers might be contemplating retirement (the first wave of baby boomers, born between

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To provide feedback or to subscribe to the Consortium electronic listserv, e-mail us at

PlantOps@energy.wsu.edu.

Archived issues of *ShopTalk* are available at:

www.energy.wsu.edu/apps/PlantOperations/NewsletterArchive.aspx

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Shop Notes

By Bob MacKenzie,
Consortium Manager

Happy summer, Consortium professionals! We are constantly impressed with your innovative, creative approaches to the economic downturn and constant specter of reduced resources. Many of you have taken advantage of Consortium offerings – including some who received on-site, detailed assessment of your operations. These services augment your existing programs, without adding onerous costs.

The “Hot Wash”

Have you heard of the four-part case study method? Generally, there are four primary components to every project, and these components provide an outline or structure for operational events and activities: **define the problem, plan, execute, evaluate.**

Facility managers generally do a good job of the first three, but the final component – evaluate – is often overlooked. We seldom have time (in the words of a steely-eyed Consortium member) to “talk about the last thing we did because we’re hip deep in the next one.” But evaluation goes a long way toward avoiding the hurdles next time – allowing you to learn from your mistakes, increase productivity and keep employees satisfied.

Well, we won’t hold hands, but it is a good time to suggest an elegant tool to use in evaluating a project or event at your facility. The tool’s nickname is the



Bob MacKenzie

“Hot Wash,” and comes from a military/government term used to describe the “after-action” discussions and evaluations of an agency’s performance.

We think Hot Wash sounds cool (OK, we’re not really all about cool, but names do matter) and members can get their arms around it. The Hot Wash should be relatively painless, short and sweet – an in-person session with everyone involved in the project or event. No graphs, no charts, no dog and pony. “We meet, talk about how things went, and see what to keep and what to do better next time. Nothing fancy. Hot Wash.” Try it out!

A Healthy Consortium

Your word-of-mouth recommendations have resulted in a number of new members; they bring depth, experiences and resources to our “family.” And, importantly, most of you have renewed your memberships, validating the worth of collaborative facilities management and helping each other through these tough times. See page 8 to view our complete member roster, highlighting the Consortium’s newest members. ✖

Bob

Youth Offenders Help Feed Local Community

By Phil Partington, Consortium staff

Stories of good things being done to support communities are not told nearly enough – especially good things being done by correctional institutions. Maple Lane School near Centralia, Washington, is a medium/maximum security fenced facility that provides juvenile offenders an academic program, as well as on-campus work experience. The school is part of the Washington State Department of Social and Health Services' Juvenile Rehabilitation Administration.

In 2009 administration and maintenance staff worked together to start a gardening program at Maple Lane. The staff designated one half-acre for a garden to be worked by school residents. The produce grown in the garden is then given to ROOF (Rochester Organization of Families) Community Services for its food bank.

Cindy Caturia, who manages the food bank, is thankful for the organization's good relations with Maple Lane. The relationship began in 2002 when Maple Lane did their own holiday food drive competition between their offices. Last year, Maple Lane staff proposed the garden idea to Caturia, who was delighted.

The garden's contributions not only increase the amount of food in ROOF's food bank, but also bolster the nutrition of its clients. As Caturia explains "Fresh produce isn't something we get very



Brian McElfresh tests the crop produced by the school's garden.

often. To have good, fresh organic food grown in the community is a boon."

Caturia went on to say that Brian McElfresh, a mental health treatment coordinator for Maple Lane School, "even asked us to make a list of what we'd prefer – giving us more control over what was grown. The experience has been great. We even had the opportunity to see the garden and talk with the kids involved with it."

Tony Mendoza, with the Maple Lane maintenance staff, oversees the garden. "We're thrilled this project has worked out," he said. "It gives the residents here something new to do, while teaching a skill and helping the community." Maple Lane residents who work in the garden are also given an opportunity to earn school credit for that work.

Despite the challenges of running the Maple Lane facility on limited resources, this partnership shows that collaboration and good public stewardship is not only possible, but can be a win-win.

Contact Gary Avery, plant manager 2, 360-273-3187, or e-mail averygm@dshs.wa.gov for more information about Maple Lane School.

Contact Cindy Caturia, 360-273-6375, for more information about ROOF Community Services' food bank, or visit www.roofcommunityservices.org. ✂



Cindy Caturia runs the ROOF Community Services food bank, and credits Maple Lane School for their positive support to the local community.

Innovation

Continued from page 1

1946 and 1954, became eligible for Social Security retirement benefits in 2008), most have delayed because of the economic downturn.

"The economy is what has kept our retirement-eligible employees around as long as they have," said David McCuiston, custodial supervisor for Mukilteo School District. "In fact, I may work a few more years myself as a result of the worsening fiscal environment."



David McCuiston
Mukilteo School District

Speculation about waves of retirements has gone on for years, as the baby boomers hit their 60s. The power engineering industry reports that about 40 percent of their power engineering faculty will be eligible for retirement in the next five years, with about 27 percent anticipated to actually retire.

Kim Milburn is director of facilities of Saanich School District north of Victoria, BC. He believes the next five years will produce a retirement exodus, and that the school district will not have the ability to fill positions from within for many of their specialty areas as well as administration leaders.

Milburn notes that "It's going to the market place that will make the difference. We're fortunate because so many highly qualified



Kim Milburn
Saanich School District

people like the Victoria area and want to live here."

Pierce Transit in Tacoma recognized early-on the need to prepare for retirements from its workforce, and has been lauded for a cutting-edge apprenticeship program. "Training figures prominently in our tactical and strategic planning," said Larry McCarty, Pierce Transit facilities manager. For example, the apprenticeship program for their bus mechanics takes

the employees from entry level to Journeyman level ASE-certified mechanics – a significant program, as the transit authority has more than 75 mechanics.

Outsourcing – Pros/Cons

Another innovative, sometimes controversial outgrowth of the sour economy is outsourcing. Outsourcing is a popular solution in private sector facilities management. However, a question in this economy is whether the quality that outsourcing provides is worth the price. Is it a cost-effective or unnecessary expense? And, does it necessarily provide enduring value in a public or non-profit setting?

Chris Lehmann, member of the International Facility Management Association (IFMA) (www.ifma.org/) and Vice

“



Training figures prominently in our tactical and strategic planning."

Larry McCarty,
Facilities Manager,
Pierce Transit
Tacoma, WA

”

President National Accounts of ISS Facility Services, thinks outsourcing has merit in the right circumstances. He believes that facility managers want to partner with industry leaders whose core competency is in performing facility services. "Outsourcing facility services with the right organization can be a cost effective endeavor without sacrificing quality," says Lehmann.

A factor in deciding which services to outsource and which to bring in-house is the size of the organization. For larger organizations, such as universities, it is cheaper to bring services in-house. According to an IFMA

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Innovation

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2006 study, "An Inside Look at FM Outsourcing," there seems to be consistency over which services are outsourced and which are performed in-house. The facility management services most often outsourced are in the maintenance and operations categories, such as housekeeping and landscaping. In-house staff generally handles space management and facility planning functions (such as furniture inventory and space redesign) as well as budgeting and financing.

"Organizations choose to outsource for a number of reasons," the IFMA study says. "The most important criteria when deciding whether or not to outsource are to better manage costs and fluctuations in work flow, as well as to improve quality of service by accessing specialized knowledge, experience and specialty skills."

You'll read more on outsourcing pros and cons in future issues of *Shop Talk*.

Communicate!

Penny Koal, dean of capital facilities at South Puget Sound Community College in Olympia, has instituted a number of innovative processes designed to make facilities management more effective on the ever-growing campus. Communications is critical to Koal's program.

"We plan on creating a facilities newsletter for the campus to create awareness of what we're

doing, what tasks may not get done as often because of reduced staff, and what strategies we're implementing to face these challenges," said Koal.

Reduce Energy Costs

Paul Smith is director of facilities for The Evergreen State College in Olympia. He has reacted to the downturn by making use of every tool possible. "We've lost three FTE, which means we've had to reevaluate our workload and figure out if something needs to come off the table."

Smith notes that "our managers have been working with staff on working more efficiently to reduce transportation costs. We take a harder look at how we're doing our projects, and are even using Job Order Contracting (JOC) on one project, which allows me to move some staff to other maintenance issues. Custodians are also playing a role by ensuring our lights are out when they should be out."

Energy conservation has been one of Smith's emphasis areas. "Ideas our staff have come up with in the past calendar year, along with support from the campus community, have helped us save about 20 percent on energy costs. That helps a lot, and we can carry that money forward."

One strategy is to finish proposed ESCO (energy service company) projects on the campus and apply for rebates and grants from their utility, Puget Sound Energy (PSE). "We got a PSE grant for

\$425,000, which we can put into the operating pot and use to fund additional ESCO projects to help reduce utility usage."

Pierce Transit has also been successful in securing energy efficiency funding. A Bonneville Power Administration grant acquired through their local utility will cover up to 70 percent (according to estimated energy savings) of a lighting retrofit project. Larry McCarty explains that, according to estimated energy savings once the project is installed, the agency's investment will be paid back in lower energy bills in less than two years.

Kudos

Your Consortium staff applauds members for their innovative solutions, panache and can-do attitudes so evident in schools, colleges, state and provincial offices, non-profits, utilities, tribal organizations and more. Thanks for all you do!

For further information on innovative approaches and solutions during this economic slowdown, contact Bob MacKenzie at 360-956-2055 or e-mail bobmac@energy.wsu.edu.



VRF – An Underappreciated Technology in the U.S.

By Marcia Karr, WSU Extension Energy Program

Introduced in Japan over 20 years ago, Variable Refrigerant Flow (VRF) heating and cooling systems are still relatively unknown in the United States. They now condition over 50 percent of Japanese medium-sized (less than 70,000 square foot) commercial buildings and about 35 percent of larger buildings. They quickly became popular in Asia, Australia and Europe and were finally introduced in the U.S. in the early 2000s.

VRF systems are not appropriate for all commercial building applications, but they are another tool for engineers to consider. Applications include offices, retail spaces, hotels, luxury apartments, light industrial buildings and data centers – both new and existing buildings.

What is VRF?

VRF systems (also known as VRV – variable refrigerant volume) are heating, ventilating and air conditioning (HVAC) systems similar to residential ductless heat pumps. However, VRF systems are typically larger, installed in commercial buildings, and include more indoor units per outdoor unit than ductless heat pumps, as illustrated in Table 1. In addition, VRF indoor air handlers are available in more styles than the wall-hung ductless heat pump style.

Compared to ducted systems that cool by airflow, VRF systems provide heating and cooling using refrigerant, thereby significantly

minimizing duct losses (See Figure 1). Some VRF systems can provide simultaneous heating and cooling, allowing energy recovery between zones. For example, a simultaneous heating and cooling system can transfer the heat removed from an area requiring cooling to an area that is in heating mode, rather than rejecting the heat.

There are four components that are modulated to control temperatures and optimize energy use: the condenser fan, the indoor fan coil, the compressor and the expansion valve. The controls for VRF are somewhat more complicated than ductless heat pumps, but no more complicated than a chiller and boiler system. Features vary from one manufacturer to another (ease of retrofit, first cost, etc.), but energy savings claims are similar.

Factors to Consider for Simultaneous Heating and Cooling

VRF systems with simultaneous

heating and cooling capability have better part-load efficiencies and potentially higher energy savings and incentives.

Good applications include buildings in which different zones may require heating and cooling at the same time.

Simultaneous heating and cooling capability can add \$5,000 to the cost of a system (over the cost of a VRF system not capable of simultaneous heating and cooling; costs will vary with specific requirements), but can lower operating costs, depending on the amount of actual heat recovery.

VRF Benefits

Some of the benefits of VRF technology are:

- Potential operating cost savings due to better part-load efficiencies and duct loss minimization

See **VRF** on page 7

Table 1:
General Comparisons

	Ductless Heat Pump	VRF Heating or Cooling	VRF with Simultaneous Heating and Cooling
Relative cost	Low	Medium	High
Maximum compressor size (tons)	5	30	24
Number of indoor zones per outdoor condensing unit	1-8	Up to 50	Up to 50

VRF

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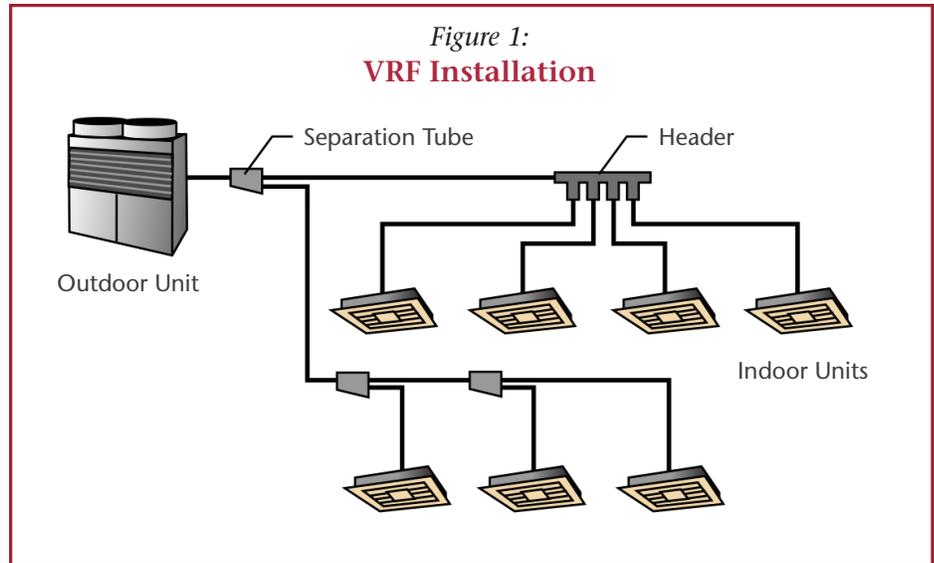
- (compared to standard air-to-air heat pumps)
- Smaller mechanical space requirements – both interior and exterior
 - Design flexibility with the variety of indoor air handler options
 - Easier retrofits where running ductwork is an issue
 - Relatively lighter weight, minimizing structural requirements
 - Potentially lower electrical retrofit costs; always check electrical requirements for the replacement system

Installation and Maintenance Considerations

It is important for the equipment manufacturer to be involved in the design of refrigerant line lengths, zoning, and equipment sizing for the building loads and diversity of spaces. Another consideration is when to integrate economizers – some jurisdictions allow an exception to the economizer code requirement. Code-required ventilation is another consideration with non-ducted systems.

The control systems are complex, but they can be integrated into building automation systems. VRF systems need to be evaluated for compliance with code refrigerant limitations and good installation practices.

To maintain VRF system warranties, installation and maintenance



should only be provided by certified contractors. Commissioning is important for obtaining optimal performance, good air distribution, noise control and temperature control.

Additional Information

“New and Cool: Variable Refrigerant Flow Systems,” American Institute of Architects, April 10, 2009:

http://info.aia.org/aiarchitect/thisweek09/0410/0410p_vrf.cfm

“Information for CEE Program Administrators On The New Part Load Efficiency Metric For Unitary Commercial HVAC Equipment”:

www.cee1.org/com/hecac/Prog_Guidance_IEER.pdf

ENERGY STAR® Program Requirements for Light Commercial HVAC (see page 5 reference to AHRI standard 1230): www.energystar.gov/ia/partners/prod_development/revisions/downloads/lhvac/spec_v2_final.pdf. ✖

Marcia Karr is an Energy Engineer with the Washington State University (WSU) Extension Energy Program. She has over 30 years of experience in commercial building design, construction and maintenance.



Consortium Members

K-12 Schools

Bridgeport
Camas
Centralia
Chehalis
Chilliwack, BC
Colville
Coquitlam, BC
Delta, BC
Easton
Eatonville
Enumclaw
ESD 101
ESD 114
ESD 121
Federal Way
Highline
Hoquiam
Inchelium
Ketchikan Gateway
Borough, AK
LaCrosse
Liberty
Lopez Island
Lyle
McCleary
Medical Lake
Mission, BC
Moses Lake
Mukilteo
Nine Mile Falls

Oak Harbor
Ocosta
Okanagan Skaha, BC
Orcas Island
Orondo
Olympia
Peninsula
Port Angeles
Port Townsend
Portland, OR
Renton
Republic
Saanich, BC
San Juan Island
Selkirk
Shoreline
South Kitsap
Snohomish
Sunrise Beach
Surrey, BC
Thorp
Wenatchee
White River
Wilbur
Wishkah Valley
Yakima
Yelm
Universities/Colleges
Clark College
Community Colleges of
Spokane

Everett Community College

Grays Harbor College
Highline Community College
Olympic College
Seattle Central Community College
Seattle University
South Puget Sound Community College
The Evergreen State College
Washington State University Extension
Energy Program

Municipalities

City of Centralia
City of Hoquiam
City of Kent
City of Longview
City of Olympia
City of Port Townsend
City of Tumwater
City of Vancouver
Clark County
Cowlitz County PUD #1
Grays Harbor Public Development Authority
Jefferson County

King County Department of Executive Services
Lakehaven Utility District
Lewis County
Pierce County
Pierce County Library System
Pierce Transit
Port of Sunnyside
Skamania County
Sound Transit
Tacoma-Pierce County Health Department
Whatcom County
Yakima County Fire District No. 5

States/Tribal/Misc.

State of Alaska
Squaxin Island Tribe
Hopelink (BC)
Tacoma Convention & Trade Center

Washington State Agencies

Corrections
Criminal Justice Training Commission
Ecology
General Administration

Health
Housing Finance Commission
Licensing
Liquor Control Board
Military
Natural Resources
Parks & Recreation
School for the Deaf
Social & Health Services
Transportation
Veteran's Affairs
Washington State Patrol

*Our warm welcome to new members in **bold blue** type. We look forward to serving your facility and operations needs.*

Consortium Energizes Relationships with Members

Be on the lookout for the *Consortium Membership Engagement Form*.

While adding a new form to your plate might prompt groans and moans (after all, nobody likes more forms to fill out), keep in mind that your responses will help our staff bring value to the Consortium. The forms will also engage new members and re-engage returning members with a clear, visible understanding of the services available to them. It is not just public relations – it is a way for us to track that you receive the services you pay for!

Help us to learn more about your organization so that we can be a more effective tool in your toolkit. By keeping up-to-date records of each member interaction with Consortium staff (such as acquisition of needed equipment, a survey conducted on behalf of the member, a custodial assessment performed, etc.), we can help maximize the potential from your Consortium membership.

We will be chatting with you about the form in the near future.

For questions or comments about the Consortium Membership Engagement Form, contact your Consortium staff, 360-956-2055, or e-mail PlantOps@energy.wsu.edu.