

Plant Operations Support ShopTalk

Plant Operations Support Consortium

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2009 Energy/Facilities Connections Conference raises the bar

Collaboration key to surviving lean times

Members realize more than \$2 million in savings in 2008

By Phil Partington, POS program coordinator

Members have increasingly relied on Consortium support in these lean economic times. Waste, redundancies and inefficiencies were minimized in 2008 and more support looms ahead. Still, many still don't know where to turn, and your POS team is working diligently to not only support the 122 members already in the Consortium, but to also get the word out to public organizations not yet members. Plant Ops is up to the challenge, as evidenced by the \$2,672,490 the program saved members in just the past year and one half. To date, the Consortium has saved its members more than \$47 million total.

While the financial forecast for 2009 may look dreary, the Consortium 'family' leans on one another for mutual benefit. Plant Ops staff is excited about the opportunity to help members get through these difficult times. After all, the program is fundamentally designed for such challenges. In the past year, Consortium members have advantaged modular buildings; kitchen equipment, including stoves and stainless steel cafeteria counters; high density filing systems; office furniture; HVAC systems; storage tanks; vehicles; and other items. Members leveraged the Consortium's project management services around the state. They've also utilized the services of Plant Ops' assessment team conducting assessments for maintenance, custodial, energy conservation, staffing surveys and more.

Here's what members have to say about the value they received from the Consortium.

(Please see "Review", continued on page 2)



("Review," continued from page 1)

Wesley Anderson, facilities manager for the Criminal Justice Training Commission: "There is a diamond that shines over General Administration that provides unlimited support and resources to Facilities professionals....In times of economic perils, when it seems impossible to find resources that are affordable and reliable, I have found the Consortium to be one of the best values for the buck..."



Wesley Anderson



Steve Fry

Steve Fry, WMS Band 2 Department of Ecology: "Anyone involved with the management, operation and maintenance of facilities needs a good toolbox full of resources. The Consortium provides many such resources. The consortium is good value for the dollar in these times of struggling budgets."

Dr. Debra Howard, superintendent of Selah School District: "I have appreciated the help provided by Bob and the crew when we requested a no-fault assessment of our custodial and maintenance services....I value Bob's knowledge of the technical side as well as his deep understanding of leadership and stewardship of resources."



Dr. Debra Howard



Paul Smith

Paul Smith, director of facilities for The Evergreen State College: "The Consortium provides outstanding value. We've used POS on JOC work (in the past). Their project manager helped us get through our projects within budget and on time. POS also helped us secure a modular building that we have been using to house part of the staff during renovation of our library. I have yet to make a request and not get a response. The staff of POS can be counted on to help."

Mike Scott, facilities director at Fircrest School (DSHS): "In economic times like these, it is reassuring to know that the combined expertise and experience of the Plant Operations Support staff and the Consortium is available to us. To us, their organization and support is essential to our success now more than ever before.... The Consortium is a lot like a computer; to function without one is hard to imagine."



Mike Scott



Jeff Vrabel

Jeff Vrabel, facilities director at the City of Tumwater: "Over the years, I have contacted Plant Ops for technical assistance, professional opinions and as a sounding board for ideas. Their staff has the expertise and professionalism to help with any situation or steer you in the right direction. With budget constraints that every public agency has to deal with, being a Plant OPS member is like having additional staff in your work group."

Contact Plant Ops staff to find out how we can assist with your operations, 360-956-2057, or e-mail plantops@energy.wsu.edu. It's never too early to renew membership. For non-members, ask about how the Consortium can be relied on to save your operations dollars, time and effort, and even making you a hero with your constituents. Visit Plant Ops on the web, www.ga.wa.gov/plant.

Shop Talk is a quarterly publication of the Plant Operations Support program. The newsletter is intended to be an informative and operationally-oriented medium for public facilities managers. Contents are also available in hard copy. We welcome feedback and input on the newsletter's contents from readers. We reserve the right to edit correspondence to conform to space limitations.

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Maintenance and troubleshooting HVACR equipment for mechanical problems (part three)

By Greg Jourdan, HVAC professor and BOC instructor, Wenatchee Valley College

This article was originally published in the BOC Bulletin and is reprinted here with permission. For more information about Building Operator Certification, go to www.theBOC.info/wa. Images and illustrations provided by the Fluke Corporation.

Look for part 1 of this article in Summer 2008 Shop Talk and part 2 in Fall 2008 (<http://ga.wa.gov/plant/SHOPTALK.HTM>)



Greg Jourdan

Maintenance for the Cooling Tower

The cooling tower condenser water is exposed to contaminants from outside air, i.e., leaves, twigs, pigeons, etc. Thus it is exposed to uncontrolled atmospheres which effect

efficiency and operation. The following are basic maintenance procedures for towers: (See Figure 6)

- The sump and exposed water can freeze during cold weather operation, thus electric sump heaters and controls needed to be inspected for operation.

- Cooling tower maintenance includes checking the water flow across the tower, checking for proper water levels, inspecting for clogged screens, physically checking the spray nozzles for proper water distribution. Remember to also check pumps, fans, drives, and freeze protection.

- Proper water treatment includes testing for pH, TDS (Total Dissolved Solids), conductivity levels, and checking for corrosion and scaling on the surface of the heat exchangers. Additives such as algacides and biocides are often added as needed to neutralize pH levels and mineral contents. Algae buildup and slime has detrimental heat transfer impact to the condenser tube bundles, which reduces water flow and heat transfer capacity. Confirm proper water treatment with an experienced water chemical expert that you trust and has proven experience in the industry.

- Remember to drain and clean the tower and spray system and sump for cold weather operation before each fall season.

Troubleshooting the Air Side of the AHU - Air Handling Unit

Fan system maintenance is important to maintaining peak operating efficiency of the HVAC system. It should include inspecting the:

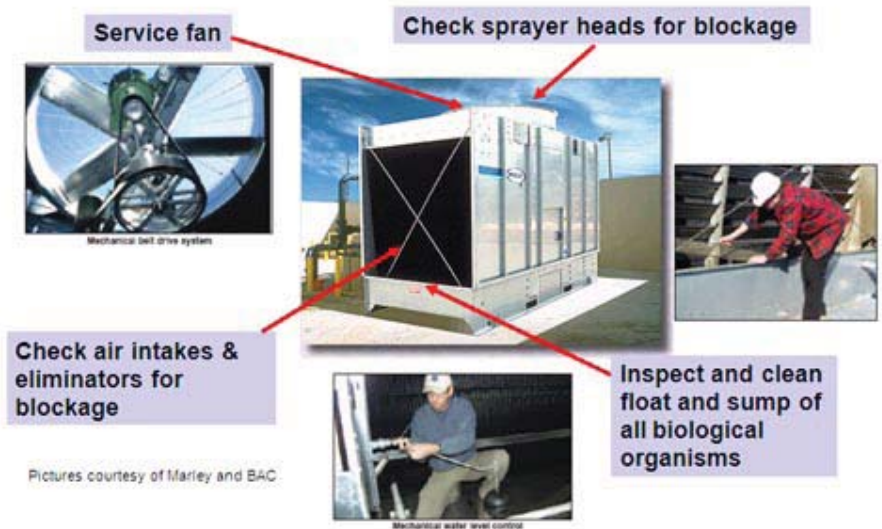


Figure 6-Routine inspections on cooling towers.

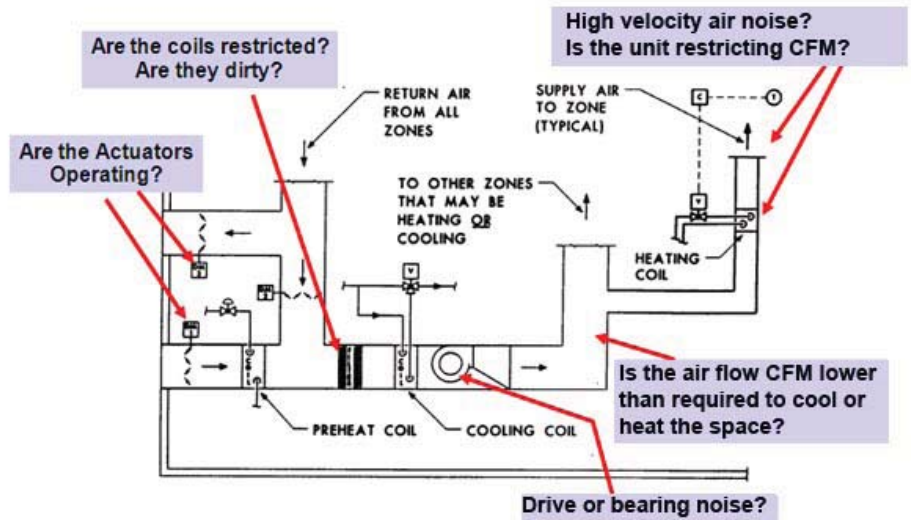


Figure 7-Routine inspections on AHU fan systems.

- Drive Systems, Filtration System, and the Air Distribution.

- Belts and drive systems should be inspected on a regular basis.

(Please see "HVAC", continued on page 6)

Getting lean and going green

Thinking small can create balance in the economic, social and environmental equation

By Casey Wick, Assistant Director of Physical Plant, Custodial Services at Hamilton College



Casey Wick

The current unstable economic climate is driving many organizations to strive harder and further than

ever before to define innovative ways to do more with less. Likewise, social and environmental influences are driving plant operations professionals to identify and adopt practices and policies consistent with sound stewardship of organizational resources. Even the best intentioned institutions are not insulated from the challenges of today's operating environment.

Fortunately, trimming down operating expenses, while endeavoring to maintain the highest of stewardship standards, are complimentary and parallel pursuits. In addition, operating procedures, practices and policies, which lead to cost containment, can often yield results that advance other aspects. When facility professionals engage in the decision making process, it is wise to think holistically and identify creative ways to balance economic, social and environmental equations.

Doing more with less is a common mantra heard in facilities operations today.

Institutions must work tirelessly to identify creative strategies, which will stretch operation dollars. One of the simplest ways to accomplish a measure of progress is to always think small. Think small in terms of the number of product purchases, inventory held and what materials are truly essential to the operation.

Consider this example:

One of the simplest and routine tasks performed in facility functions is window cleaning. This task is often performed using ammoniated window cleaner and paper towels; both commodity products. However, by thinking small, facility managers can achieve balance in the economic, social and environmental equation in even simple tasks, such as window cleaning. Advances in cleaning technology have led to the development of microfiber technology. Microfiber cleaning cloths are very effective for daily window cleaning and use only water. By standardizing the use of microfiber and water in daily window cleaning, the use two commodity products is completely eliminated. Reduced cost, elimination of ammoniated product and reduction in the use of paper product equals a balance in the economic, social and environmental equation.

The above example is only one of many situations in which thinking small can

yield big results. Too often facility managers embark on a quest to achieve the much sought after economic, social and environmental balance with grand visions of majestic and sweeping changes. Unfortunately, such a mindset often causes the easiest and most immediate solutions to be overlooked. Thinking small and focusing on those aspects of an operation that can be directly controlled by a facilities manager is an enormous source of opportunity. Facility managers are entrusted with vast amounts of resources. From operating dollars to the safety of employees, facility managers must think in the microcosm of their respective operations first. While it is necessary to consider those larger and more sweeping changes at some point, the first steps must be the small ones. Those first small steps will give way to broader strides and eventually lead to a fast and easy pace to the desired end; an efficient effective, efficient and sustainable facility operation.

Casey Wick is the assistant director of Physical Plant, Custodial Services at Hamilton College in Clinton, New York. He has been a professional in the cleaning industry for fifteen years. During that time, he has published numerous articles on a variety of maintenance and operations related topics. Due to popular demand, Casey will also be a returning speaker at the Energy/Facilities Connections Conference 2009. Contact Casey for more information, 315-859-4189, or cwick@hamilton.edu.



Casey presented for the custodial track at the 2008 Energy/Facilities Connections Conference and, due to popular demand, will be returning to present at the 2009 EFC Conference as well.

A driving lesson for operations and maintenance

Important factors in maintenance planning and scheduling meetings

By Torbjörn Idhammar, VP and Partner, IDCON, Inc., a maintenance management consulting and training company
Reprinted with permission from IDCON, Inc.



Torbjörn Idhammar

Picture this. Personnel from a plant are driving along a road in an automobile. The maintenance supervisor

is equally out of control. Plant management frequently focuses on past data analysis rather than future improvements. Maintenance is often "blindfolded" due to tight short-term cost control measures instead of long-term results. Meanwhile, the operations group is becoming desperate and therefore dictates what maintenance should do.

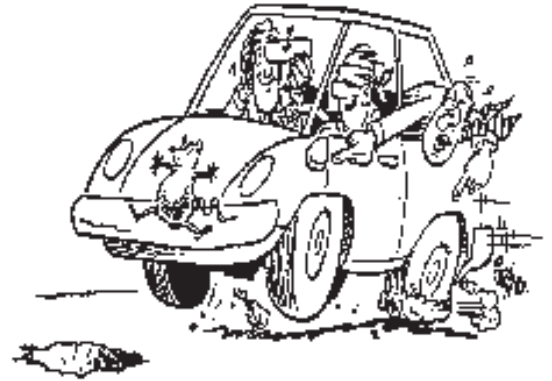
is driving blindfolded. Sitting beside the maintenance supervisor is the finance person who is peering in the rear view mirror. In the back seat, the superintendent, or division head is urging the maintenance supervisor to proceed at top speed while simultaneously warning him about a flat tire.

The behavior described has many names—the circle of despair, unplanned maintenance, or reactive maintenance. Whatever name you prefer, you must understand the point from a maintenance perspective. Maintenance work needs management through good maintenance planning and scheduling. How does one start such an improvement?

This situation is obviously out of control. In a plant setting,

This article will discuss a starting point in terms of "Maintenance and Operations 101."

One key element of an operations and maintenance partnership is well-organized daily or weekly planning and scheduling meetings. Although you may already have these meetings, are they as productive as they could be? The purpose of such meetings is finalizing a schedule and possibly finalizing minor planning. The meeting objectives or agenda are the following:



- Review work from yesterday.
- Update work for today.
- Finalize work for tomorrow.

(Please see "Driving", continued on page 8)

Consortium member roster

K-12 Schools

Abbotsford, BC
Anacortes SD
Bremerton
Brewster
Bridgeport
Camas
Centralia
Chehalis
Chilliwack, BC
Coquitlam, BC
Delta, BC
East Valley, Spokane
Easton
Eatonville
Edmonds
Enumclaw
ESD 101
ESD 171
Federal Way
Goldendale
Highline
Hoquiam
Ketchikan, AK
LaCrosse
Liberty

Marysville
McCleary
Mission, BC
Moses Lake
Mount Vernon
Mukilteo
North Thurston
Oak Harbor
Ocosta
Okanagan Skaha, BC
Olympia
Peninsula
Port Angeles
Port Townsend
Puget Sound ESD
Quilcene
Quillayute Valley
Saanich, BC
Seattle
Selah
Shoreline
South Kitsap
Snohomish
Sumner
Sunrise Beach
Surrey, BC
Wenatchee

Universities/Colleges

Cascadia CC
Clark College
Columbia Basin CC
CC of Spokane
Everett CC
Grays Harbor College
Highline CC
Olympic College
Renton TC
South Puget Sound CC
The Evergreen State College
Univ. of Washington
WSU Extension Energy

Ports

Port of Everett
Port of Kennewick
Port of Sunnyside

Municipalities

City of Bellevue

City of Hoquiam
City of Kent
City of Oak Harbor
City of Olympia
City of Seattle, Dept. of Transportation
City of Seattle, Fleet and Facilities Dept.
Seattle City Light
City of Seattle, Public Util.
City of Tumwater
City of Walla Walla
City of Vancouver
Clark County
Cowlitz County
Cowlitz County PUD #1
Grays Harbor Public Dev. Auth.
Jefferson County
King County Dept. of Exec. Services
Lakehaven Utility District
Lewis County
Pierce County
Pierce County Library System
Skamania County
Tacoma-Pierce Cty Health
Thurston County
Whatcom County
States/Tribal

Alaska DOT
Hopelink
Oregon Youth Auth.
Squaxin Island Tribe
Vancouver Convention & Exhibition Center

Wash. St. Agencies

Corrections
Criminal Justice Training Comm.
Ecology
General Administration
Health
Information Services
Licensing
Liquor Control Board
Military
Natural Resources
Parks & Recreation
School for the Blind
School for the Deaf
Social & Health Services
Transportation
Veteran's Affairs
Washington State Patrol

Our warm welcome to new members in **green type** and to those members who have re-subscribed. We look forward to serving your facility and operations

(“HVAC”, continued from page 6) •

Filters should be changed on a fixed schedule or as indicated by filter monitoring instruments.

- Leaks in air distribution systems should be sealed to maximize delivered air quantity and quality to each space or zone.
- Remove grates and vacuum heat registers regularly to remove dust and debris.
- Check ducts yearly for loose connections and holes.

Develop and follow a preventive maintenance plan that includes maintenance schedules. Activities in the plan should include: (See Figure 7)

- Inspect outside and dampers for nearby sources of contamination.
- Ensure that air dampers are clear of obstruction and operating properly.
- Regularly replace or clean air filters.
- Clean and inspect drain pans.
- Inspect and clean heating and cooling coils.
- Inspect fan motors and belts.

- Regularly inspect and clean air humidification equipment and controls.
- Inspect and clean as needed air distribution pathways and variable air volume (VAV) boxes.

Air Conditioner and Heat Pump Basic Maintenance.

Follow these simple guidelines to ensure most efficient operation:

- Install a programmable or DDC (Direct Digital Controlled) thermostat designed specifically to optimize heat pump operation. “Smart” thermostats minimize the use of back-up heat and give you convenient program options.

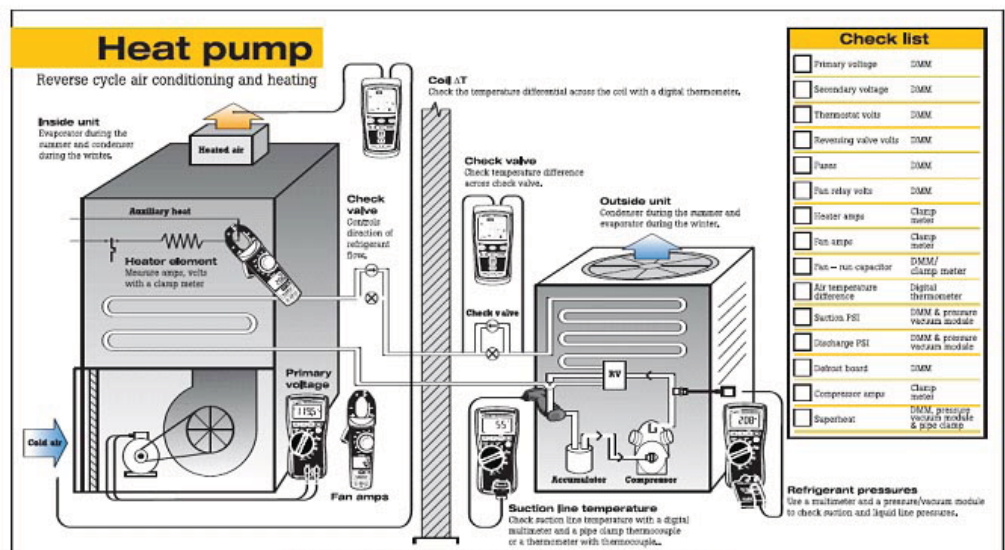


Figure 8-Routine inspections on heat pumps.

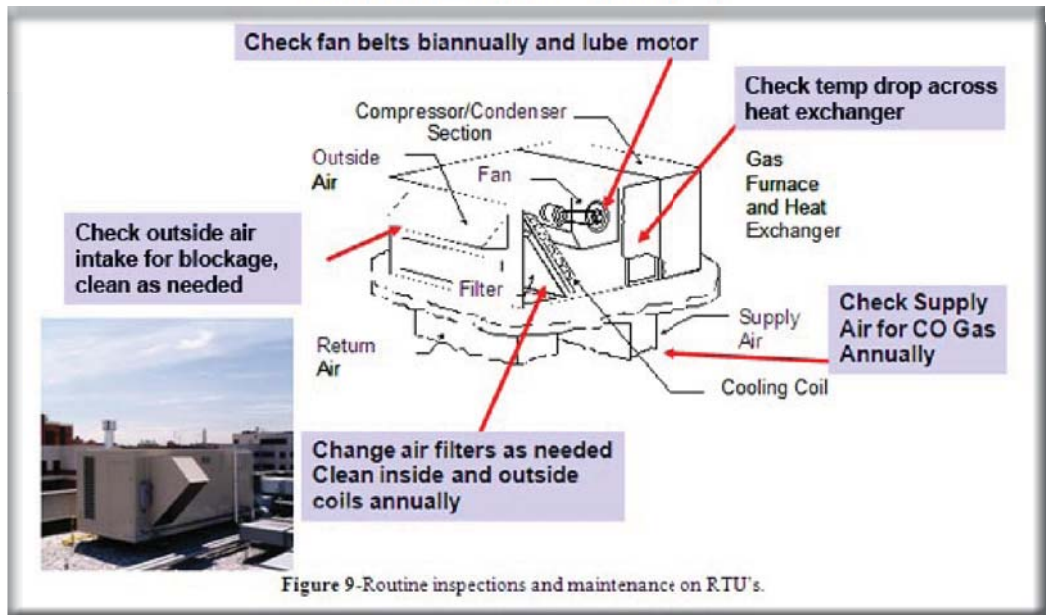


Figure 9-Routine inspections and maintenance on RTU's.

- Set the temperature to adjust down no more than 10 degrees at night when you're away from the office.
- Don't make frequent thermostat changes. This can cause the back-up heat to come on, which can increase heating costs. It can also cause the system to turn off and on and damage the compressor.
- Check air filters once a month. Clean or replace them when dirty.
- Don't block air returns and air supplies with office furniture or other items.
- Keep the outdoor unit free of leaves, dirt and nearby foliage.

Heat Pump Basic Troubleshooting (See Figure 8)

- Make certain that the thermostat is set higher than the actual room temperature to create a call for heat or cooling as needed. If the thermostat is programmable, be certain the batteries are fresh.
- Test for power to the air handler by moving the fan switch from “auto” to “on”. If the blower runs, the air handler is functional. If nothing happens, check the circuit breakers on the air handler cabinet and the breakers or fuses in the main panel. If any break-

(Please see “More HVAC,” continued on next page)

("More HVAC", continued from page 6)

ers are tripped, reset them once. If they trip again do not reset them. Because controls are internally mounted, and high voltage wiring is exposed, only a qualified electrical service tech should open panels.

- If the air handler runs constantly but cannot satisfy the thermostat setting, it is possible the backup heat is running but the condenser is not. Some condensers have the high pressure cut-out switch externally accessible. Look for a button sticking out of the cabinet in the vicinity of the refrigerant pipes. Press it in. If the machine starts up, the head pressure got too high, possibly from turning on and off too quickly, too much or too little refrigerant, or an electrical interruption. If the condition repeats itself often, have a service tech check it.

Maintenance and Troubleshooting the RTU - Roof Top Unit

- The most important component to check on any RTU is the filters. Keep air filters clean to give the proper air flow across the furnace in the winter and

evaporator in the summer. If air flow is reduced because of a dirty filter, the discharge air temperature will rise. This reduces the heat transfer capability of the heat exchanger and causes premature failure. (See Figure 9)

- Check operating and safety controls for fail safe mode. Make sure all components in the system are working as designed.

- Outside air "blockage" can also be caused by inoperative damper motors. So damper motor operation should be checked under normal operating conditions.

- Checking the amp draw of the compressor and fans is also a good idea to catch problems early.

- On gas heating RTU's, make burner adjustments for proper fuel-to-air ratios. Check flame condition regularly. Check discharge for Carbon Monoxide (CO) leaking through worn or cracked heat exchanger. This should be done monthly as a minimum, including on-site constant monitoring sensors and alarms.

- Lubricate fan motors according to the manufacturers recommendations.

- Inspect v-belts at least quarterly for proper tension and excessive wear.

Greg Jourdan has been the Director/Instructor of the Refrigeration Technology Program at Wenatchee Valley College since 1985. He is a certified instructor for the Air Conditioning Contractors of America and has taught for the U.S. Navy and Grand Coulee Dam. Contact Greg for more information, 509-741-7105, or e-mail gjourdan@msn.com. Read part one of this article in Summer 2008 Shop Talk, <http://www.ga.wa.gov/plant/SHOPTALK/SUM08.pdf>, and part two in Fall 2008 Shop Talk, <http://www.ga.wa.gov/plant/SHOPTALK/FALL08.pdf>.

Greg was a presenter at the 2008 Energy/Facilities Connections Conference, and will be back by popular demand for EFC 2009.

2009 Energy/Facilities Connections Conference raises the bar

Learn how to manage in lean times

EFC 2009 is going strong. We say this every year, but this year's conference promises to be the best ever, building on the successes of previous year's events and providing attendees relevant, practical tools sure to enhance your productivity and effectiveness.

We're excited to announce changes to this year's conference from past years. First, due to overwhelming positive feedback regarding the custodial component of the conference, we've added an extra half-day of custodial track without cutting back on any of the other sessions. That means an even more comprehensive training opportunity for attendees at the same nominal price.

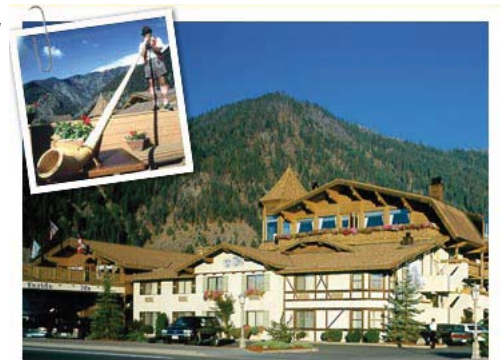
Another recommendation we've addressed is the need for more advanced-level sessions. The last thing we want is to rehash the same information and focus of last year. We want to reward the returning participants with ways to make it in this fickle economy. As a result, one can expect a better mixture of technical

as well as management-based sessions, with a greater emphasis on in-depth training. You'll also learn solar, wind and other energy advances.

Your conference takes place Wednesday - Friday, May 13-15, 2009, in Leavenworth, Washington. Conference hours are from 8:00 a.m. to 5:00 p.m. May 13th and 14th and from 8:00 a.m. to 12:00 noon May 15th. Cost for attending is a reasonable \$325 for Consortium members and \$500 for non-members.

Register online by visiting the Plant Ops website, www.ga.wa.gov/plant, and clicking on "Energy/Facilities Connections Conference" on the right hand side. Contact your POS staff if you have any questions, or would like assistance registering.

Certainly, reserve your lodgings early at the Enzian Inn. Last year the rooms went fast, and it's much more convenient for participants to stay at the conference



The Enzian Inn is a cozy, intimate setting ideal for networking opportunities and training sessions. The lovely Bavarian setting provides a number of recreational opportunities after the training sessions.

venue. Call (800) 223-8511 or (509) 548-5269. Mention group number 8117 to obtain our special rate.

By all means, join us for what portends to be the finest conference/training event you'll attend in 2009.

(“Driving,” continued from page 5)

- Finalize schedule for following week by 2:00 p.m. on Friday.
- Track planning and scheduling of key metrics.
- Schedule 100% of work force including contractors.
- Resolve new work requests.

The meeting should be attended by the zone or department operations representatives, maintenance supervisors, and planners. The operations liaison must have sufficient clout to set a schedule without being overridden by others after the meeting. Maintenance should represent both mechanical and electrical/instrumentation maintenance.

The meeting should occur mid-day and last no longer than 20 minutes. Keeping the meeting to this limit with effective results requires the following:

Having a priority chart.

- Planning for work in the backlog before the meeting.
- Knowing the availability of people.
- Realizing that all meeting agreements are final—any change is break-in work.

Tracking the performance of these meetings is critical. Upper management must drive—not simply support—planning and scheduling meetings. A simple scorecard will help. The scorecard tracks the following:

- Did all the proper people attend?
- Did attendees do their preparatory work?
- What is the level of unapproved work orders in the backlog?
- Was the first cut of the schedule for the following week posted on time?

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Check out a sample scorecard online: <http://www.idcon.com/meeting-scorecard.pdf>.

In addition to the meeting indicators, the group should track the classic planning and scheduling indicators such as scheduling compliance, planning compliance, paper machine compliance, etc.

A major process plant in the United States recently implemented better planning and scheduling procedures. They achieved 7.7% average increased reliability in their bottleneck worth US\$ 6 million in eight months.

Torbjörn Idhammar is Vice-President and Partner at IDCON, Inc. For more information about the article or IDCON, Inc., call (919) 847-8764 or e-mail info@idcon.com.

IDCON, INC is a reliability and maintenance management consulting firm, also known as a management asset firm. Since 1972, they have provided maintenance consulting services to small, mid-sized and large companies in 43 different countries. Check them out online at <http://www.idcon.com>.