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Reader Action Card
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CONTRACTORS' PAY SUFFERS WHEN MARGINS GET TRIMMED

by Thomas A. Mahoney

Why is it so hard for contractors to find good service technicians? Because the industry doesn't command the kind of value for its services that would permit contractors to compete for the best talent around.

That's the message from a *News*' survey of salary and service rates in the hvac industry. A total of 242 contractor-subscribers responded to the questionnaire, a 12% response rate.

Many of the respondents had some acute criticisms of the present market dynamics.

"Our hvac industry can't pay wages necessary to attract trained people, like the auto industry at \$25 to \$30 per hour," said one respondent.

Another contractor pointed to the \$80 to \$100 per hour to repair computers and copying machines.

"Why can't we get that?" he asked.

A gloomy assessment was offered by another: "The hvac industry will never advance. In fact, the industry will decline because of too many owners and workers with sharecropper mindsets."

Which came first?

It's a chicken-and-egg proposition, the respondents say. Contractors under-value their services, starving their resources that would permit them to bid for the top technicians.

Many contractors complained about the usual problem of "competing with the dumbest competitor in town."

"More contractors should price their services based on their own overhead costs and desired net profit, instead of trying to 'best' the guy down the street," said one.

"It's a dog-eat-dog industry and it does not have to be. We make it that way," said another.

Some 57% of contractors think this industry's entry-level salaries are high enough to attract quality applicants.

Even contractors themselves don't pull down wages like rock stars or orthodontists. The median range of salaries for owners and presidents is

	Under \$35,000	\$35,000 to \$50,000	\$50,001 to \$70,000	\$70,001 to \$100,000	Over \$100,000	(Base)
President	15%	31%	18%	13%	23%	211
Vice president/GM	21%	30%	16%	19%	14%	118
Operational manager	30%	33%	21%	12%	4%	82
Sales manager	24%	45%	21%	8%	2%	80
Service manager	36%	33%	25%	5%	1%	120
Design engineer	20%	41%	25%	14%	—	44
Spouse of president/owner	77%	12%	7%	—	4%	68

Table 1

	Under \$25,000	\$25,000 to \$35,000	\$35,001 to \$40,000	\$40,001 to \$50,000	Over \$50,000	(Base)
Service technician	18%	46%	17%	12%	7%	223
Installer	35%	37%	14%	7%	7%	170
Estimator	18%	37%	21%	15%	9%	87
Office manager	41%	30%	15%	8%	6%	145

Table 2

between \$50,000 and \$70,000.

Table 1 shows the salary range of owners and management staff. About two-thirds of owners earn \$70,000 or less. Salaries for service-sales-design management staff typically hover in the \$30,000 to \$40,000 range.

Note that the spouse of the president-owner rarely earns more than \$35,000.

Hvac contractors, especially those in the residential-light commercial sector, are overwhelmingly (84%) open shop, which contributes to a wide

spread in the wages paid to their employees. There is no "one-size-fits-all" pattern in wages.

Table 2 shows wages for service technicians, installers, estimators, and office managers. A significant number of these earn below \$25,000 a year, while those in the \$40,000-plus range are relatively rare.

"I'd like to pay much better, but I'm just getting by now," said one contractor.

See page 3 for more details.

Thieves steal ton of CFC-12

AIKEN, S.C. — More than 2,000 lb of CFC-12 were stolen from a warehouse at Savannah River Site (SRS), an Energy Department nuclear weapons plant.

The material has a street price of \$18,164, according to Bill Taylor, spokesman for the plant. It is the first time refrigerant has been stolen from the facility.

Officials don't know when the theft occurred. Workers noticed the material was missing last month while

moving refrigerants to a new storage facility.

The plant is offering a reward of up to \$1,000 to help catch the thieves. The case is being investigated by Wackenhut Services, Inc., which provides security to SRS.

Although federal authorities have recently prosecuted cases involving the smuggling of large volumes of CFC-12 into the U.S., this is believed to be the first reported case of large-scale theft of the materials.

MAILING LABEL

NEWSPAPER

Exploring causes and cures for wet, contaminated systems

by Warren C. and C. Curtis Trent
Trent Technologies, Inc.

TYLER, Texas — Far too many hvac systems are operating with wet and contaminated interiors. This is costly to building owners-users, and there is clearly no technical or economic justification for these conditions.

During the past two cooling seasons, we examined scores of hvac

units throughout the southeastern U.S. We found a majority of them wet inside and rife with algae, mold, and other fungi. We found stagnant water standing on the rusting and deteriorating floors of many units.

Also, damage caused from condensate overflow was frequently

evident.

The widespread existence of these deplorable conditions is reason for serious concern. They are costly for building owners-users and unhealthy for building occupants. But they are avoidable.

We have identified (and listed below) 11 causes of wet and contaminated systems, each of which can be prevented:

- Excessive airflow;
- Deficient airflow;
- Inadequate provisions for ventilating air;
- Non-insulated coolant or refrigerant lines;
- Improper blower location;
- Inadequate filters and filter holders;
- Highly slanted cooling coils;
- Unsuitable drain port locations;
- Long, undulating, poorly routed condensate drain lines;
- Unduly large condensate drip pans; and
- Inadequate seals on condensate drain lines of draw-through hvac systems.

Each of the above causes of wet and contaminated systems, along with possible cures, is discussed in detail in the August, 1995 issue of the technical publication *Engineered Systems*. In the article, these causes are appropriately referred to as design deficiencies.

All but one of these deficiencies can be corrected through the application of widely known and accepted design practices. The one exception is item 11, "Inadequate seals on condensate drain lines of draw-through hvac systems."

In general, neither the industry nor academia has adequately addressed this design deficiency. The industry practice of using a condensate trap to effect a seal on the drain line of draw-through hvac systems has been a costly failure.

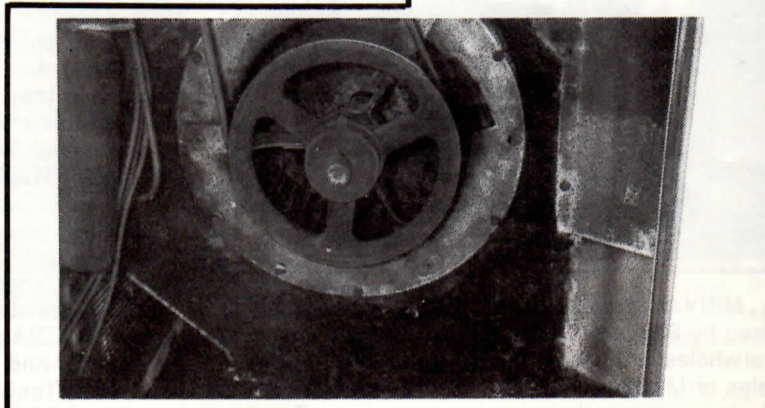
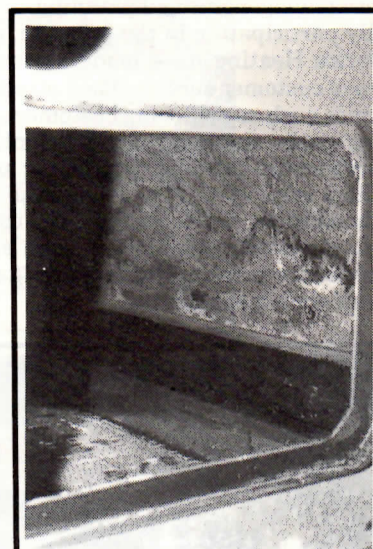
The condensate trap exhibits so many failure modes that it is unreliable and ineffective as a seal. In fact, this design practice is the primary cause of most wet and contaminated draw-through hvac

systems.

When a draw-through hvac system is operating without a seal or with a dysfunctional seal on the condensate drain



PHOTOS RIGHT and below depict conditions typical of the units observed by Curtis and Warren Trent of Trent Technologies, Inc. Deterioration and contamination of the floors, equipment surfaces, and internal walls of the hvac units are apparent.



line, air is drawn through the drain port of the drip pan at velocities frequently exceeding 30 mph.

Condensate is blown continually from the drip pan onto the internal components of the hvac unit and ductwork, keeping them wet and providing ideal conditions for the growth of health-threatening microorganisms.

Moreover, condensate will stand in the drip pan at a depth equal to the negative pressure in the drip pan compartment, thus affording a large area for the growth of algae.

In addition, condensate will overflow, often causing property damages, if the negative pressure (in inches of water column, or in. wc) reaches a level greater than the pan depth.

New control available

There is now available a condensate control device which elimi-

nates the problems caused by missing or dysfunctional seals (or traps).

The device is reliable, simple, and has no moving parts. The operating principles and physical description of this particular device (the "Costgard" condensate control device) are reviewed in the August, 1995 issue of *Engineered Systems* magazine.

This device alone will not solve all the internal wetness problems caused by draw-through hvac systems. It does, however, provide the missing link that makes it possible to eliminate these troublesome and costly problems, in both future and current hvac systems.

Warren Trent is a registered professional engineer and ceo of Trent Technologies, Inc., 535 WSW Loop 323, Tyler, Texas; 903-509-4843. Curtis Trent is the company's president.

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Circle 57

Hvac system design criteria

Presented here is a set of hvac system design criteria, which will aid building owners in conveying to architects and engineers their requirement for drier and cleaner hvac systems:

1. Remain dry inside (except the cooling coil and a small drip pan), during all operating conditions.

2. Prevent outside air and contaminated gases from being drawn into the system through the condensate drain line, under all operating conditions.

3. Be capable of controlling temperature and relative humidity of the occupied space within the human comfort zone established by the ASHRAE 1993 *Handbook Fundamentals*, page 8.13, Figure 5, under all operating conditions.

4. Meet or exceed the requirements identified in ASHRAE Standard 62-89 or the most-recent

version of that standard.

5. Comply with applicable building, mechanical, and plumbing codes.

These criteria are equally applicable to future and redesigned hvac systems.

Draw-through hvac system designs that include the conventional condensate trap, cannot meet criteria 1, 2, and 5. Failure to meet these criteria is the primary cause of the wet and contaminated conditions so common to hvac systems now in operation.

By demanding that their hvac system designs meet these and the remaining stated criteria, building owners-users will realize the following benefits for nominal initial cost: lower maintenance, longer equipment life, less property damage, less absenteeism, fewer health problems, and increased productivity.