NEWSPAPERS & TECHNOLOGY

Reprinted with permission from Newspapers & Technology, June 1998

FACILITY PLANNING BY DARIO DIMARE

It's important to learn about keeping your cool

One of the most frequently, poorly designed systems for a pressroom is the cooling system. Many newspapers, and I would venture to say most newspapers with air conditioned press halls, have over-designed cooling systems. However, in this case, bigger is not better. The principles in this article illustrate a way to save hundreds of thousands of dollars in up-front costs and even more in long-term operating costs.

This article is not intended to be used to design a press cooling system, but rather to make one aware of some of the issues to consider when designing a pressroom.

A cooling system that is oversized simply may not work. An oversized cooling system can cool the air so quickly that the system short-cycles. The result is a cold, damp room, frosted coils, or more simply put, a pressroom where the temperature cannot be controlled.

Even if the system works, an oversized chiller results in higher energy and maintenance costs if it is not operating at maximum efficiency.

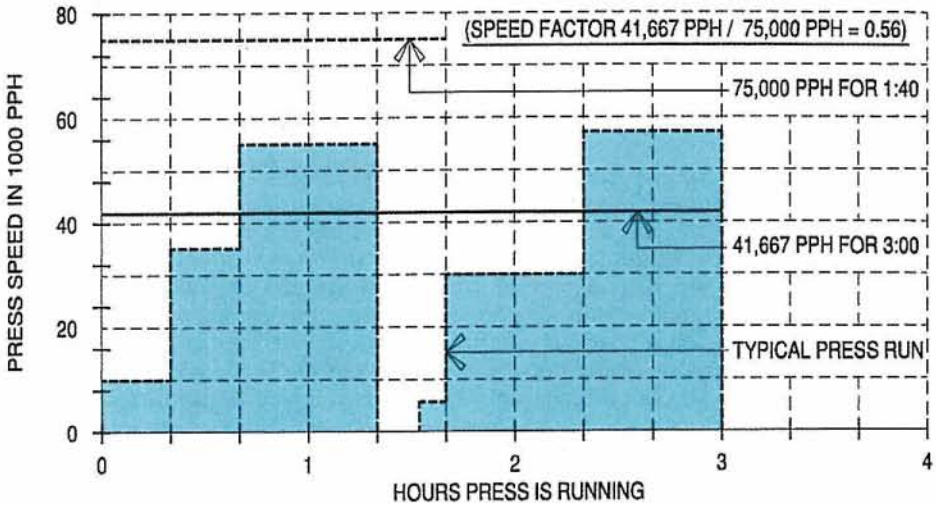
Finally, the initial cost of a cooling system is expensive. If the chiller size is based on the number and size of the press motors only, as is often the case, it is possible to spend twice as much as is necessary on the initial purchase. This would not be cool.

The following is a quick, simple example of some of the issues to consider when sizing a press cooling system. This example makes the following assumptions:

- An eight-unit, double-width press
- 36 printing couples
- 10 150-horsepower motors
- A press speed of 75,000 cph
- A 3-hour press window
- A newspaper circulation of 125,000

Typically, the press cooling requirement in tons would be calculated as follows: Connected Load = (10 motors) X (150 HP) X (0.212 tons per HP) / (0.9 motor efficiency) = 353.3 tons.

One would then purchase a 353.3 ton cooling system, correct? No. But it is done with great frequency and at great cost.



SPEED FACTOR = 56%

The following factors should be considered in order to properly size a pressroom cooling system. You will see that it results in a more efficient system at less than half the price. This is a powerful example of why one should select design professionals familiar with newspaper operations. A local firm typically would overlook some or all of the following examples.

These factors, when properly applied, will make the system more affordable, more energy efficient and more practical for the intended use.

Speed factor

Even though a press is designed to run at 75,000 cph, I have yet to see someone run the press at the design speed during the total print window. In this case, when considering make-ready, web breaks and plate changes, the average press speed is the 125,000 circulation divided by three hours or 41,667 cph. That is 56 percent of the design speed.

Time factor

When a press starts up, both the press and the press hall are cool. As the press begins to run, it heats up the press iron and the pressroom. The press will continue to get warmer and dissipate heat even after the press has been shut down.

The press may well be outputting the most amount of heat shortly after the run. Fortunately for the users, the press is off at this time and is allowed to cool down while the motors are off.

Therefore, the maximum possible heat load may never be reached. A reasonable factor by which to reduce the total press load is 65 percent.

Press motor sizing factor

Do you pick a 100 hp motor to drive a 100 hp load? No. Motors typically are sized to be larger than the load they must carry. We will use a factor of 85 percent in consideration of this.

Press warm-up factor

Does a warm press pull as many amps as a cold press? No. As with most mechanical devices, once the oil has been given the opportunity to warm up and liquefy, the press will run at a higher efficiency. The motors must be sized for a cold start, but will not work as hard once the presses have been running for awhile. A conservative factor of 90 percent could be used for this situation.

Continued on back

Utilization factor

With a 36-couple press we have assumed that the typical press run will use an average of 30 couples during the run. We also have assumed that a printing couple not in use will consume half the power of one that is in use. This results in a 0.92 reduction factor.

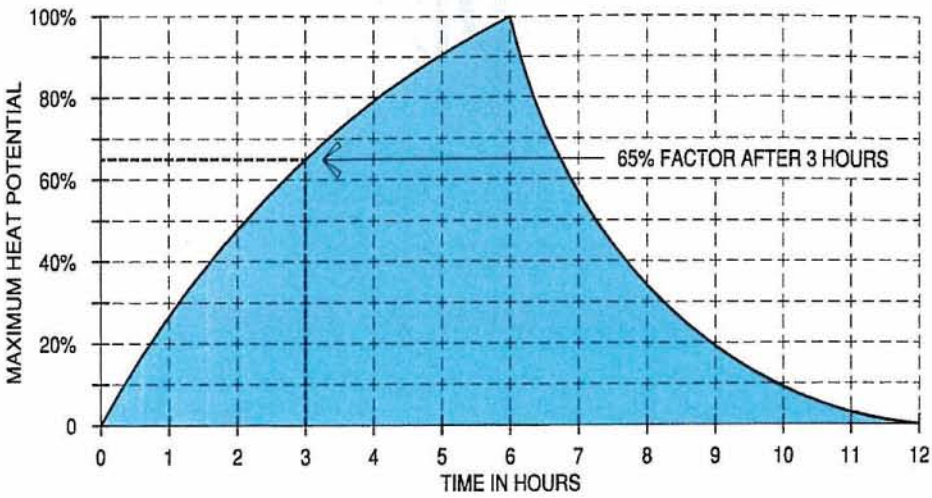
Now, if these factors are totaled, in addition to the initial "typical" sizing factor, the result is as follows:

The assumed air conditioning load is 353.3 tons (initial sizing). However, using the formula and the adjusted numbers from each factor, the actual air conditioning load is 92 tons.

[353.3 tons (connected load) X 0.56 (speed) X 0.65 (run time) X 0.85 (motor sizing) X 0.90 (warm up) X 0.92 (utilization) = 26 percent of 353.3 tons or 92 tons].

This is about one third the size of the original cooling system. At $950 per ton, this would equate to an initial savings of a quarter of a million dollars. This would be cool.

In retrospect, one can see that an overdesigned cooling system can cost more to buy, cost more to run and possibly may not even work. This is a terrible price to pay for being uninformed with regard to the proper design of a press cooling system.▲



TIME FACTOR = 65%

Dario DiMare is the president of Dario Designs Inc., an architectural, design, planning and consulting firm specializing in newspaper facilities. He can be reached at 508-877-4444.