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INDUSTRY SECTOR REPORTS

Chillers: Indispensable to Any Hospital's Operations

By Jean Grillo

The bottom line about medical chillers is succinct: they are indispensable equipment that if not in good working order can grind any hospital's operations to an abrupt stop.

Should one of these sometimes hefty (as much as 90 tons) cooling systems go awry, multimillion dollar hospital equipment—- MRIs, CT Scans, X-rays, Operating Room Air Conditioners——stops dead in its tracks.

Special low temp process chiller used for Bio Diesel production down in Gonzales Texas. (Courtesy of Legacy Chiller Systems)

And the dominoes would continue to fall: diagnostic and therapeutic operations stop, patients' health is perhaps imperiled and a hospital, clinic or center sees multiple revenue streams shut down until repairs are completed.

So when problems unexpectedly beset chillers, most often as a result of poor maintenance, the medical institution can go into what Martin King, president of Legacy Chiller Systems, Placerville, CA, describes as "mission critical" mode.

And the folly of allowing such a situation to occur, say chiller manufacturers and specialists, is that 95 percent of all problems could be avoided, provided facilities adhere to a regularly scheduled preventive maintenance program.

"It's so easy to catch the problems before they occur," says Jerry Hoover, HVAC Service Solutions, Inc., Dallas, PA, a chiller specialist serving a wide variety of institutions in the Northeast. Hoover, who strongly advocates quarterly service calls, also says that whatever service and maintenance company hired, "make sure they are familiar with the equipment."

Even with the best maintenance, however, chillers sometimes fail, though usually it's not mechanical failure. More often than not, refrigerants run low, filters get clogged, dust and dirt builds up. But such small factors are not always obvious to

the medical equipment engineer at a facility, so it becomes just another important reason to call in a professional chiller service company.

OEMs tend to favor authorized service operations as well. Most back the practice of having factory trained mechanics and technicians primarily service one brand and its considerable range of products

Though some facilities still call the local air conditioning repairman on occasion, that's usually not the whole answer. While HVAC technicians certainly can service the chiller, the advantage to a medical chiller specialist is knowledge of various modalities and how the chiller fits into their operational system.

Why Chillers Are So Important

MRIs, CTs and many major medical devices generate heat while in operation. With the advent of super conducting MRIs that rely on liquid helium, and high speed helical CT scanners that have powerful X-ray tubes, chilled water is the perfect solution to dissipate the heat that is produced.

Chillers, meanwhile, with integrated tanks and compressors are the workhorse of the fleet and are available in many sizes, from one to 90 tons. Most medical MRI chillers, however, weigh in around two to 10 tons, costing up to $40,000.

Manufacturing a chiller has become a specialized skill, one that the OEMs have ceded to independent manufacturers.

The OEM matches the size of the chiller to the heat of the head load. If an end user purchases a chiller that is too small in an effort to save money, or a used machine that is overpowered to the heat load demand, then a chiller can fail more quickly. An underpowered chiller will have to work too hard, and a compressor can burn up. With an overpowered chiller, the compressor turns on and off too quickly, and again the compressor can burn up.

"All the OEMs have special applications for the large-scale image equipment that needs to be kept cool," King says. His company, in fact, is among the dominant players in manufacturing MRI chillers, shipping "hundreds annually."

Filtrine Manufacturing Company, another important chiller manufacturer, has been in the cooling business since 1901. Based in Keene, NH, it's forged close ties with the major medical equipment OEMs over the past seven years, says Mark Huston, director of marketing and communications.

"All the major OEM's work with us because everything we do is customized to their design," Huston says, adding, "and our chillers are backed by a lifetime guarantee."

And Turner Hansel, a Filtrine vp, points out, "The key issue when installing an MRI chiller is getting the start-up right. Doctors," he says, "hate to see scan time interrupted, because MRI's are cash cows."

Chiller Technology Simple Albeit Sophisticated

Chiller technology has not changed much over the years nor is it that complicated. Still, chiller technology, and almost more important, chiller repair and refurbishing requires a host of special skills.

While some medical equipment engineers are familiar with the technology of the chiller and the basic concept, very few, if any, will try to repair a broken chiller. An MRI technician will replace parts and a cold head, or load liquid helium, and a CT engineer will diagnose high voltage problems in a CT scanner, but neither has the skill to work on a broken chiller. Sometimes chiller problems result from design flaws or while installing the chiller. But the vast percentage of breakdowns is attributable to poor maintenance.

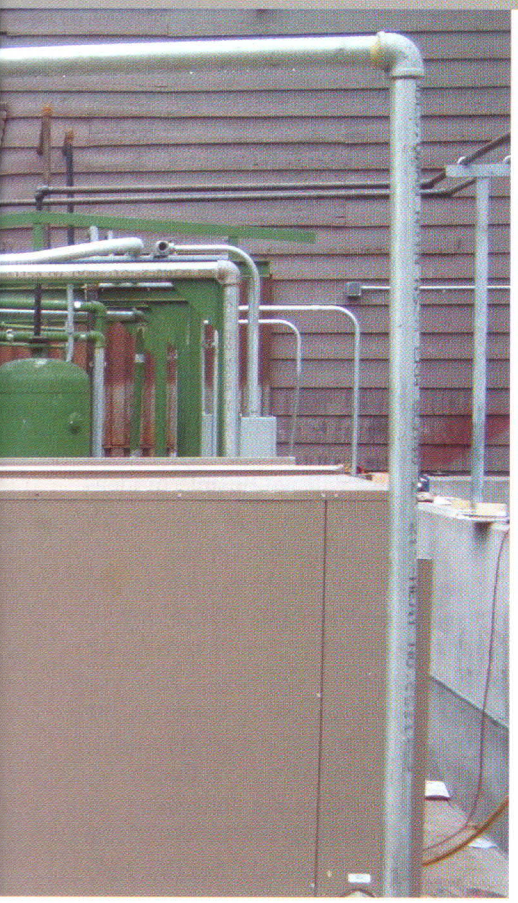
According to Gary Julian, GJ Maintenance, Garland, TX, "The biggest cause of chiller death is not cleaning the condenser coils," he says. "These are hard to get at within the compressor system. It takes some effort to disassemble and get access."

Julian's specialty is medical chiller maintenance for display trailers, 18-wheelers hospital and medical centers set up to house MRI and cath labs. According to Julian, costs for a correctly refurbished chillers averaging seven to 10 tons is anywhere from a few thousand to more than $20,000.

Sig Carlson, president and founder of Recovery Systems, acknowledges that his company, based in Crystal Lake, IL, "gets a very high percentage of business for chillers related to GE, Siemens and Philips equipment."

Chiller manufacturers must work closely with independent and sometimes authorized service personnel around the world. These service personnel install the machine, perform preventative maintenance, and repair it when it breaks.

"The key is that chillers must be sized for the right range of outside temperature, whether its 40 below or 120," says Carlson. "What we do at Recovery Systems is offer compressors that can be integrated to operate separately or in sequence."



Carlson estimates smaller chillers, five to 10 tons, for example, cost roughly $10,000. Larger ones can run up to $40,000 with refurbished equipment "half those costs."

Chiller Repair and Refurbishing a Vital Service

Among the chiller refurbisher and repair companies polled, most agree preventive maintenance several times a year is key.

"I would say a mobile unit should be looked at every three months," says Ronnie Taylor of SVSR, Inc, Statesville, NC, "With fixed sights every six months." Over or under powering a chiller means, "the motor windings overheat and short. This could cause contractors and controllers to fail also, causing major downtime," Taylor adds.

Laurence Frayne of Prairie Imaging, Hurst, TX suggests that checking "all systems" twice a year is sufficient but Mitchell Guier, broker for North American Medical in Sweet Springs, MO, thinks four times a year is best. "I think a service contract should require maintenance every few months, with personnel actually going up on the roof to make sure the chiller isn't leaking," he says.

Sig Carlson agrees about regularly scheduled maintenance, but says it's very difficult to find quality repair people to do the work.

"Schools have eliminated a lot of the mechanical trade education they once offered high school students." Carlson says. "Today, you are really dependent on using people who don't know a lot about the product they're repairing."

There are simple chillers, generally two to 10 tons that represent about 75 percent of all medical applications. But then there are complex ones, 24 tons or more, with multiple compressors and separate chilling units, such as the Siemens 3.1 Tesla MRI. The latter requires only expert attention.

An inadequately maintained chiller can quit after only a few years. A well-maintained one can last "a lifetime."

"Adding more sensors to (detect) overload helps prolong chiller life," says Saeed Hashemi whose company, NASS Medical Image, does all service, repair, application and technical training for GE products and is based in Ontario, Canada.

While Legacy's King feels strongly that "mission critical" chillers ought to be purchased new "otherwise you're not going to get the same warranty, you're not really going to know a machine's past maintenance record," others such as Hasemi disagree. He says it's appropriate to rebuild a chiller and that it only makes economic sense to opt for new one, "when (the current one) is not capable of cooling to the minimum requirement."

● [DM 5370]

NOTE: DOTmed.com has been involved in auctioning a number of chillers because frequently when the original equipment manufacturer sells the machine, they ask the hospital to buy the chiller separately. When the machine is sold or traded in, the hospital is sometimes left with chiller, and they have utilized the DOTmed Online Auctions to sell them.

DOTmed Registered Medical Chillers Sales and Service Companies

For convenient links to these companies' DOTmed Services Directory listings, go to www.dotmed.com and enter [DM 5370]

Name	Company – Domestic	City	State	Certified	DM100
Martin King	Legacy Chiller Systems	Placerville	CA		
Sig Carlson	Recovery Systems	Crystal Lake	IL		
Mitchell Guier	North American Medical	Sweet Springs	MO	●	
Ronnie Taylor	SVSR, Inc.	Statesville	NC		
Mark Huston	Filtrine Manufacturing Company	Keene	NH		
Marc Fessler	Independence Cryogenic Engineering	Little Egg Harbor	NJ		
Gary Provenzano	Proton Services, Inc.	Sayreville	NJ	●	
Jerry Hoover	HVAC Service Solutions, Inc.	Dallas	PA		
Gary Julian	GJ Maintenance	Garland	TX		
Laurence Frayne	Prairie Imaging	Hurst	TX		

Name	Company – International	City	State	Certified	DM100
Saeed Hashemi	NASS MedImage	Richmond Hill	Canada		
Rami Marom	ElsMed Ltd & Relaxation Inc	Holon	Israel	●	