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Mission Critical

BY ANDY PEARSON, PH.D., C.ENG., FELLOW ASHRAE

“Mission critical” is usually applied in HVAC terms to IT systems, where a system failure results in significant business impact. Once, when designing a system for the government data center that processed unemployment benefit checks, I asked what the implications of downtime were because the damages clause in the contract was unusually harsh. I expected to hear of financial losses measured in millions per hour, but, “Questions are asked in the House of Commons” was the ominous answer.

However, the term is rather overused, and we have perhaps become desensitized to its real implications. To be truly “mission critical,” a system failure needs

to inflict major and irreparable damage on the whole enterprise, with implications stretching far beyond the business directly responsible for the process and affecting many other stakeholders.

In contrast a “business critical” system is one that would seriously impair the company operating it, but would not have such an effect on the rest of society. A failure in the unemployment benefit system would bring misery to millions and could conceivably bring down a government, whereas the failure of an online ticketing system would damage the ticket agent, but if the public could get tickets by other means, the effect on them would not be so serious.

Air-conditioning systems are not usually mission, nor even business critical. If a failure makes an office uncomfortable, people will grumble and cope. If the air-conditioning serves a convention center or concert hall, it could result in cancelled business and lost revenue, but these cases are the exception rather than the rule.

One area of the air-conditioning system that deserves mission-critical status but is frequently neglected is the water treatment of cooling towers and condensers. Properly and respectfully treated, this equipment is perfectly safe. But, if left unattended, it can cause illness and even death far beyond the site boundary. ASHRAE Standard 188-2015, *Legionellosis: Risk*

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Management for Building Water Systems, gives excellent guidance on keeping this mission-critical utility in good shape.

Refrigeration systems are more likely to be business critical than air conditioners since their purpose is to make chilled or frozen product that cannot be fulfilled if the equipment is broken. They may also be mission critical if failures result in increased risk of food poisoning. However, usually multiple parallel cold chains exist, so it is difficult to envision circumstances that would cause a critical situation across the whole food market, short of a prolonged power outage or a disruption of the refrigerated transport deliveries.

A recent mission-critical problem in refrigerated transport was the discovery of counterfeit refrigerant

containing methyl chloride (R-40), which can react at high temperature with aluminum to cause a compound that spontaneously combusts in contact with

air. Explosions of refrigerated containers in relatively quick succession in Vietnam, the U.S., Brazil and China led to a worldwide scramble to determine the cause of the failure and to reassure operators that the millions of other refrigerated containers were safe.

Our food supplies cannot stand disruption of this type for more than a few hours without creating problems for the public, yet the public takes the entire refrigerated distribution system for granted. This, I suppose, is a backhanded compliment—testament to the great job done on a daily basis by thousands of refrigeration professionals in keeping the wheels turning. ■



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