[START UP]

Technical Q&A: Staying Cool, Comfortable at the Gate

Q: How do you properly size preconditioned air (PCA) systems for aircraft gates?

A: PCA systems cool and heat aircraft parked at the gate and pre-cool/pre-heat the passenger boarding bridges for passenger comfort during loading and off-loading operations. A life cycle cost analysis study can identify the most economical option for each airport based on the number of gates, gate usage schedule, local utility rates, initial capital cost and terminal space availability.

For PCA equipment to be effective, it must be sized so that it can accommodate varying sizes of aircraft serviced at each gate during peak outdoor design temperatures.

To determine a system's size, designers:
• Consult gated flight schedules to see what types of planes each gate serves and when such planes arrive and depart.
• Obtain the maximum ambient design temperature for the airport’s location, then calculate planes' conductive and solar load conditions.
• Identify the largest type of plane to be serviced at the gate when the ambient temperature is at its peak.
• Factor in heat gained when planes are full, have most of their electrical equipment operating and are absorbing heat (or cold) from the outside.

PCA systems cool outside air to a range of 30 to 35 degrees, to be pumped into each connected plane and passenger bridge. Such air comes in at relatively high pressure so that it can make its way through the plane’s small supply air ductwork.

The maximum volume of supply air is the pounds per minute of outside air cooled to 30 degrees (leaving coil temperature) required to meet the aircraft cabin cooling load.

For more information, contact Janelle Burd, 816-822-3558.

Janelle Burd is a senior mechanical engineer in the Fueling Group at Burns & McDonnell.

How It Works

Military Munitions Support Services: Protecting Against the Past

Careful mitigation measures are essential for dealing with munitions and explosives of concern (MEC) or other left-behind material that could pose an explosive threat.

Unexploded ordnance (UXO), discarded military munitions and other materials potentially presenting an explosive hazard (MPPEH), propellants, fuses, and munitions constituents and debris require delicate work to be safely identified, removed and disposed of properly.

The remediation process includes investigating the site, excavating and identifying suspect material, then removing and destroying it. Related services include emergency response support, construction support and range management.

Most remediation work is for the Department of Defense at active military bases or defense sites that have been decommissioned or are no longer used. Due diligence on almost any federal project could include MEC remediation. And there is potential for work in the private sector, such as when Burns & McDonnell performed construction support at the former Newport Chemical Depot in Indiana and discovered MEC contamination.

“There is more MEC around us than we realize,” says Roy A. Phillips, UXO Master Technician and an associate in the Burns & McDonnell Environmental Group. “Thousands of munitions response sites have been identified across the country.”

The three key elements for a successful project are the geophysics of finding the MEC or other contamination, the UXO technicians who are trained in dealing with it, and the oversight and communications from project management.

“For contamination to be addressed in a safe and timely manner, the team must be well-versed in regulatory requirements and military protocol,” says Steve Young, associate in the Environmental Group. “Burns & McDonnell combines experience in environmental program management with the technical and military knowledge to mitigate the explosive hazards.”

For more information, contact Ray Phillips, 770-510-4554, or Steve Young, 303-474-2292.