

## Indian River State College: law enforcement firing range

A TRICOIL air handler for the indoor range at a Florida state college's Public Safety Complex, where code-mandated outdoor air meets Florida humidity. TRICOIL let the design drop its electric reheat coil entirely.

### Fort Pierce, FL

IRSC Public Safety Complex, a public state college

### 40,900 cfm

Supply air, including 9,300 cfm outdoor air

### \$160,800

Contract value, with installation

### 2009–2010

Feb 2009 to Feb 2010



The outdoor TRICOIL air handling unit, with the insulated TRICOIL loop piping at right.



Factory-built TRICOIL pump and valve assembly in a NEMA 4 outdoor enclosure.

### THE CHALLENGE

Range ventilation is fixed by code. Air must sweep downrange at 75 fpm, which set the supply at 40,900 cfm, and 25% of it, 9,300 cfm, must be outdoor air to carry away lead and firing residue, with no demand control allowed, and energy recovery was cut from the budget. To save electric reheat, the original design was heading toward accepting 70% RH, which is hard on people, ammunition, targets and equipment. And the underground chilled water line already serving the site was too small for the flow a conventional system needed.

### THE SOLUTION

The engineer of record asked Sensible Equipment Company to compare TRICOIL with the conventional design. Because the precool coil takes part of the cooling duty, TRICOIL cut the chilled water flow enough that **the existing underground pipe could stay**. As vendor to the range ventilation contractor, Carey's Small Arms Range Ventilation, we engineered TRICOIL into a McQuay Skyline air handler served by the college's central chilled water plant. A factory-built pump pack with a 2 hp pump, modulating and balancing valves and a NEMA 4 control panel sits beside the unit. The electric reheat coil was eliminated, and a gas-fired instantaneous water heater adds supplemental reheat only when needed.

### THE RESULT

| Before and after TRICOIL                         |                              |
|--------------------------------------------------|------------------------------|
| Range humidity target                            | 70% → 60% RH                 |
| <b>Expected on a design day</b>                  | <b>about 58% RH</b>          |
| Electric reheat coil                             | Eliminated                   |
| Supplemental reheat                              | Gas hot water, at times none |
| <b>Undersized underground chilled water line</b> | <b>Kept, no replacement</b>  |
| System                                           |                              |
| Supply / outdoor / HEPA exhaust air              | 40,900 / 9,300 / ~12,000 cfm |
| Range held negative                              | –0.05 in. w.g.               |
| Chilled water from campus plant                  | 109 tons at 14°F ΔT          |

Design figures are from the project engineer's notes of the November 12, 2008 design review with the college. Project team: Indian River State College (owner), H.J. High (contractor), OCI Associates (MEP engineer), Florida Architects, Carey's Small Arms Range Ventilation and Action Target.

**Our first indoor range, and many since.** Indian River started our range work. Military and law enforcement ranges and training academies all pair high outdoor air with high humidity, and TRICOIL meets the humidity target without electric reheat, in new air handlers and retrofits.