

Mission San Luis Visitor Center



Project Summary

Project Size:

Mechanical Equipment Value: \$200,000

Tallahassee's Mission San Luis was a settlement once populated by Apalachee Indians and Spanish settlers as far back as 1703. As a National Historic Landmark the visitor center houses priceless artifacts, hosts a wide variety of public events, and provides constant education and outreach to the public on the Mission's history and Florida's culture during that time period. Mission San Luis is truly a cultural center for Tallahassee and the surrounding areas.

Project Objectives

- Minimize HVAC operating noise.
- Provide precise indoor air control
 - Temperature and humidity conditions – sensitive artifacts and documents
 - Maximize indoor air quality for occupant health – field trips and classes
- Maximize investment through energy efficiency and equipment longevity.
- Effectively integrate HVAC operation with other building systems.

As a public museum and visitor center, this project demanded an HVAC system that was quiet, provided excellent humidity control/indoor air quality, and was energy efficient, thereby saving public resources.

Solutions Delivered

The answer to the mechanical needs of Mission San Luis is an HVAC system centered on the first air-cooled chiller containing magnetic-bearing compressors in the Tallahassee area. A custom 120-ton Multistack Airstak MagLev™ air-cooled chiller uses Turbocor magnetic-bearing compressors with independent refrigerant circuits to deliver chilled water to air handler units. Integral variable-frequency drives (VFDs) modulate compressor output in response to load-requirement fluctuations.

Three custom McQuay Vision air handling units combine to supply 21,450 cfm of air through 28 Enviro-Tec single-duct variable-air-volume (VAV) boxes with electric heat. The Vision fan motors are also controlled by ABB variable frequency drives (VFDs) that modulate the fans to maximize efficiency and motor longevity.



| System | Total Capacity |
|---|----------------|
| (1) Multistack Airstak MagLev™ air-cooled chiller | 120 tons |
| (3) Custom McQuay Vision air handling units | 21,450 cfm |
| (3) Enviro-Tec FCUs | 910 cfm |
| (28) Enviro-Tec SDR (electric heat) single-duct VAV boxes | 21,450 cfm |
| (3) Indeeco electric duct heaters | 1,429 cfm |
| (5) ABB VFDs | 70 HP |
| (1) Complete Building Controls System | |

Featured Technology

Turbocor Magnetic-bearing Compressors

Let's try and better understand the 60-ton Multistak ASP-60X chiller module with two Turbocor TT-300 compressors used on this project.

Why are magnetic bearing compressors important? – The magnetic bearings in the Turbocor compressor completely eliminates friction at the compressor shaft, and significantly reduces bearing heat, which directly instigates a wave of positive benefits throughout the chilling process that include:

- Lower electricity use – less energy is needed to do the same amount of work.
- Quiet – Reduced sound emissions by up to 8dBA with virtually no vibration.
- Compact – 50% less footprint and 20-25% the weight of traditional compressors.
- Easier maintainability –
 - Totally oil-free operation
 - No oil management hardware such as oil separator, oil heater and cooler, oil pump, oil filter, or controls. Improved heat transfer efficiency.
 - Onboard digital controls and power electronics.
 - Integral VFD speed control allows for tighter capacity control and higher efficiencies at part load.

