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PROVIDING SUSTAINABLE TECHNICAL
AND BUSINESS SOLUTIONS

CASE STUDY

Dallas/Fort Worth International Airport - DFW Airport, Texas

FAST FACTS

- DFW Airport covers more than 29.8 square miles
- DFW Airport is the second largest airport in the United States in terms of land mass
- DFW Airport is the third largest airport in the United States in terms of operations
- DFW Airport has seven runways, five terminals and 174 aircraft boarding gates
- DFW generates \$14.3 billion annually and supports 268,500 full-time jobs
- DFW is the world's only airport with three FAA control towers

CENTRAL UTILITY PLANT UPGRADE PROJECT

The Dallas/Fort Worth International Airport first secured the services of Sebesta Blomberg in 2001 when the company was contracted to retro-commission its de-icing system. Although Sebesta Blomberg has served as a sub consultant on several projects since 1999, this was the first time serving as the prime consultant.

Due to the project's overwhelming success, Sebesta Blomberg has continued to provide on-going commissioning, retro-commissioning and facility services for the DFW Airport.

Through a \$2.6 billion Capital Development Program, the DFW International Airport has been expanding and upgrading its facilities and systems. In support of this program, Sebesta Blomberg was awarded three consecutive indefinite Delivery Contracts to provide on-call system, infrastructure, project and building commissioning, retro-commissioning, facilities support services and sustainability programs across its entire operational infrastructure. This included projects such as the new International Terminal D, the Skylink Automated People Mover System and the Central Utility Plant Upgrade.

Sebesta Blomberg also developed, launched and implemented the progressive DFW Sustainability Program for the Airport's integrated Asset Ownership, Management, Operations and Maintenance departments. It also launched the Airport's first Net Zero Energy project, which enables a project to give back an equal or greater amount of electrical power than it uses.

The plant serves all major buildings with heating and cooling utilities for the entire 28,000 acre site. In addition to accommodating heating and cooling loads generated by new building construction, the Central Utility Plant Upgrade project addressed a number of requirements.

The original steam generating and chilled water production equipment were in service since the opening of the airport in the early 1970's and are nearing the end of their expected service lives. The Texas Commission on Environmental Quality mandated a 70 percent reduction of NOx emissions, which had a dramatic impact on the operating strategy for the plant.

The existing high pressure steam boilers operate on a year round schedule to provide heating during winter months and drive steam turbine water chillers for mechanical cooling during summer months. The upgraded plant has new high efficiency boilers and electric driven centrifugal water chillers, to eliminate the requirement to operate boilers in summer months.

In addition to the replacement of the original steam turbine water chillers, the new chillers were also sized to accommodate an increase in the Airport cooling load from 11,500 tons to 28,000 tons, taking into account the new building construction. In addition, the pre-conditioned air system, which provides cooling to stationary aircraft and associated jet bridges, increased in capacity from 1,200 tons to 7,650 tons, primarily related to a centralization strategy implemented by the DFW Airport.



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Another significant factor that influenced the project was the implementation of an electric utility deregulation initiative in January, 2002. The impact of the Capital Development Program construction increased the overall electrical load for the central plant from 7.5 megawatts to approximately 32 megawatts. To effectively implement an electrical load management strategy, a thermal energy storage tank, with a capacity of 6 million gallons, was constructed as an integral element of this project.



Apart from the magnitude of the project and an aggressive schedule to have the utility capacity available to serve the completion of new buildings on the Airport site, this commissioning assignment had two unique challenges:

1. The entire existing Central Utility Plant was required to remain in full operation during the construction schedule, to serve the utility loads already in place. This required an array of creative solutions to address the verification testing process and start-up of all new equipment components.
2. Because of the emissions mandate deadline, a number of the new boilers and water chillers were installed and started into service ahead of the schedule for complete installation of all new equipment. This was necessary to allow major existing equipment components to be removed from service and release the space for new equipment installation. In addition to the phased start-up and verification testing of major equipment components, the construction schedule dictated that the new digital control system for equipment and environmental control and automation of operating sequences was not awarded until a later phase in the schedule. The result was that the first equipment components and associated operating systems were dependent on a manual operating strategy, with minimal control and virtually no automation. This approach required that two stages of the development verification test procedures and system training were incorporate into the commissioning process. In order to accomplish the complicated scheduling and coordination of multiple activities in the overall commissioning process, the collaboration of the designers, Owner, construction manager, sub-contractors and Sebesta Blomberg was absolutely mandatory.

This unique case study demonstrates the benefits of having a commissioning firm involved early in the design phase of the project. They take a leading role in coordinating schedules for verification testing and training with the design and construction team members to ensure that commissioning activities do not become critical path items.

Through Sebesta Blomberg's association with DFW, it has gained national recognition as a leading provider of professional consulting services for airports across the nation.