
Andersen Air Force Base Hits Refueling Target

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When Andersen Air Force Base was faced with the challenge of increasing throughput of a refueling system with 50% less hydrants due to reconstruction, they turned to ProcessModel.



Using ProcessModel technology, an optimum solution was found that saved taxpayer money, serviced existing traffic and provided additional capacity for the future.

Andersen Air Force Base, located on Guam, has played a vital role in defense for the United States for the past 50 years. Because of its strategic location in the Pacific, it is the primary operating location for bombers as well as a critical refueling hub for transport aircraft. When the refurbishment plans were announced, ProcessModel was selected to help solve the aircraft refueling and parking dilemma at Andersen Air Force Base. Using this technology they could compare and test proposed plans and generate new ideas about increasing productivity of the system.

Andersen has a modern fuel transport system, but the hydrants used to fuel the aircraft were in poor condition. Phase I of the reconstruction project was to replace and add new hydrants. Each phase of the project disabled large portions of the hydrant system and dramatically reduced the refueling capability.

The main problem facing the wing planners was how to maintain the capability to support a large operation while continuing the refurbishment effort.

The refueling system at Andersen consisted of 57 hydrants. Half are located on the North ramp and the other half on the south ramp. Twenty of the hydrants were inoperable due to deterioration or parts failure.

In phase one of the construction contractors will remove twenty active hydrants on the south ramp leaving 4 functioning hydrants. On the north ramp there will be 22 functioning hydrants. During the construction, fuel trucks and temporary fuel bladders will be used to help service aircraft.

With the number of hydrants cut by half, a large bomber operation with an intense airlift movement could create a process-halting queue for aircraft needing refueling. The members of the planning team all had primary concerns. The airfield manager was concerned about the queuing on the ramp, the operators wanted convenience for aircrews and the fuel technicians wanted to balance the utilization of the system.



At a Glance

Problem:

Andersen Air Force Base was required to replace an aging plane refueling system. Fifty percent of the refueling system was going to be taken offline for months. Since this refueling system is the primary method of refueling for contingency operations, new solutions were needed to protect combat readiness.

Solution:

A Lt. Col. at the base developed a model representing landing, taxi, staging, refueling, ordinance loading, service and prep, pre flight and launch operations, and the time needed to perform the sortie. The model gave a clear picture of the ramifications of the proposed refueling constraint and what would happen if procedural changes were made.

Results:

The model helped the planners develop a process to increase throughput of the refueling system even while 50 percent of the refueling hydrants are inoperative.

If queuing occurred, waiting aircraft would have to taxi to an empty parking space or stub, shut down engines and sit idle until a space became available. Then two pilots would have to restart the engines, taxi to the open position and then shut down for refueling. Each taxi burns about 4,000 pounds of fuel and can take 30-60 minutes, not including the waiting time. Complicating the process is the service time for each aircraft, which is dependent on the fuel load of the aircraft and how many other aircraft are simultaneously being loaded. ProcessModel gives them the ability to reflect the variable service times.

The hydrant system is the most efficient way to refuel, so they wanted to fully utilize the hydrants before resorting to alternate fueling methods. The planning team came up with four alternatives. ProcessModel enabled the team to test the plans and compare results.

In plan I, all bombers and tankers were routed to the north hydrants. All aircraft required taxi after refueling and created a tremendous burden on the taxi crews. All resources were utilized 90 percent of the time. The demand for taxi crews alone made this plan impossible.

In plan II, all bombers and tankers were sent to the north load stubs. All the parking stubs with hydrants were used for full service parking. The plan forced excess aircraft to the other fueling alternatives and produced an excessive burden on the truck refueling process. The safety office disapproved of the plan because it put live aircraft next to other live aircraft.

In plan III, the tankers have shorter cycle times and carry no ordinance on parking. They tried sending the tankers to the north load stubs. All the north hydrants were designed for full service loading. All bombers went to the fuel bladders and the fuel truck process. This result from this plan was excessive cycle times and excessive burden on the alternate fueling options.

In plan IV, they divided the hydrants between north load stubs and north hydrants. All tankers were



ther analysis they found that the system could handle a much higher capacity than anticipated.

Andersen will face four more phases of construction on its refueling system. With the basic model complete, they could use the model to optimize each part of the construction plans.

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sent to north load stubs and all bombers to north hydrants. When the north load stubs were full, tankers were allowed to move to north hydrants and use the other alternatives. With this plan there was almost equal utilization in all of the refueling processes and only temporary queues at the fuel truck process.

They continued to optimize the processes in plan IV looking at the mix of north load stubs and north hydrants. Other alternatives included lowering and raising the number of taxi crews. The simulation proved that the process could be supported with just two taxi crews. With fur-



FIND OUT MORE

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