

# DAIKIN PACKAGED CENTRAL PLANTS REDUCED LABOR COSTS AND INSTALLATION TIME BY MORE THAN HALF

*“Working with the Daikin team was a great experience. They took the time to listen to my concerns and came up with a perfect solution that was based completely on solving the specific challenges I was facing.”*

– Dennis Maher, Director of Facilities and Security, Trump International Hotel Waikiki

**Overview:**

The Trump International Hotel Waikiki is the only Forbes Travel Guide five-star property on the Hawaiian island of Oahu. Located steps away from famous Waikiki Beach, guests can enjoy views of Diamond Head, and experience world-class dining and entertainment. The hotel also features a Hawaiian-style spa, an ultramodern health club, and a luxurious infinity pool deck overlooking the Pacific.

Given the resort’s impeccable reputation, Facility and Security Director Dennis Maher knew that the existing rooftop HVAC system, which wasn’t performing at optimal levels due to age, needed to be replaced. And the job had to be done right - completed quickly and with minimal interruption. He also wanted robust equipment that was energy efficient and could withstand the elements: heat, frequent rain showers, wind and salt exposure from the Pacific. Maher turned to an engineering firm in Honolulu for help with the project. He also called on Daikin Applied’s Bob Mitchell to gain added perspective.

**LOCATION:**

Trump International  
Hotel Waikiki  
  
Honolulu, HI, USA

**AREA SERVED:**

689,561 square feet  
  
462 luxury guest  
rooms and suites

**CHALLENGE:**

Replace aging HVAC  
infrastructure while minimizing  
guest and staff inconvenience

**SOLUTION:**

Two Packaged Central Plants  
(PCPs) featuring Magnitude®  
magnetic-bearing centrifugal  
chillers and three Skyline®  
air handlers

# TRUMP INTERNATIONAL HOTEL WAIKIKI



## Solution:

The first proposal called for water-cooled chillers, sheltered by a simple roof structure. Upon further consideration, the group felt the roof structure would not adequately protect the chillers from the elements — decreasing their potential service life. One suggestion was to apply a special exterior coating, but it increased the price significantly. It was at this point in the design process that Maher turned to Mitchell and Daikin.

Though familiar with the equipment, Mitchell felt the proposal was not ideal for several reasons. Exposure to the elements would jeopardize the chillers' life-expectancy and installation would take longer than other alternatives. So Mitchell proposed a solution that would address the challenges: packaged central plants (PCPs).

The Daikin team recommended that Maher replace the four legacy air-cooled chillers with two high-efficiency PCPs instead. The PCP is a turnkey system designed to be configured, fabricated, shipped, installed, and started in a short period of time. It comes with a high-efficiency magnetic bearing chiller, pumps, control panels, and water treatment equipment. The package also includes cooling towers. The PCP manufacturing and assembly process is rigorously controlled to yield superior quality, i.e., it is tested for fit, finish and function at the factory prior to packaging. The modular design of PCPs is the perfect solution to cramped equipment rooms, or sites where access or space is otherwise limited — as in the hotel's case. The integrated design allows it to meet the most demanding project and commissioning schedule. Accordingly, it met Maher's time constraint challenge. It is also fully enclosed and built to resist the elements, thereby providing a longer lifecycle.

At the heart of each PCP is a Daikin 550-ton (nominal) Magnitude® 480-volt 3-phase water-cooled, magnetic bearing centrifugal chiller with a variable frequency drive. It runs quietly (important to hotel guests) and provides maximum energy efficiency. Each PCP also features a 550-ton Evapco dual-cell counterflow cooling tower, equipped with VFD-driven fans, vibration shut down safety switches, 316 stainless steel casing and 316 stainless steel water basins.

The team then recommended three new Daikin Skyline® air handlers to complement the PCPs. The Skyline air handlers are designed to combat air contamination using micro-filtration and UV lights to fight bacteria. The units feature mold-resistant drain pans and anti-microbial liners as well. Like the PCPs, the Skyline air handlers feature high-quality, robust enclosures to protect them from the elements. The Skyline product line is also known for quiet and energy-efficient operation.

## Outcome:

Geography and COVID-19 travel restrictions posed several obstacles. The engineering firm helped overcome some of them by supplying a virtual 3D walk-through of the roof and infrastructure. The video helped inform the design of the PCP and air handlers. It also helped Mitchell anticipate and resolve other details and constraints, remotely.

Roof space and weight limitations also presented a logistical challenge — which Maher resolved personally. He sourced a set of special roof-mounted derrick cranes to remove the old equipment and install the new. His logistical solution significantly reduced the associated labor and installation time.

The inherent nature of the Daikin PCP design reduced installation time by more than half as well, thereby meeting Maher's accelerated installation goal. The latter also helped minimize guest inconvenience and discomfort, helping the hotel maintain its stellar reputation. Using an PCP also helped significantly reduce associated labor costs. The energy savings were calculated by the engineering firm over the previous cooling system and are estimated at \$500,000 annually, based on the new monthly figures.



*Left: A cooling tower is lifted on the roof  
Right: A PCP is rigged to be lifted on the roof*