



## CASE STUDY

### INDUSTRY: HOSPITALITY



**CUSTOMER:** Frenchman's Reef & Morning Star Marriott Beach Resort

**LOCATION:** St. Thomas, U.S. Virgin Island



**BACKGROUND:** Marriott's Frenchman's Reef and Morning Star Beach Resort boasts 478 rooms, a luxury spa, and 31 meeting rooms with 60,000 square feet of space on the coast of St. Thomas. The resort experienced significant reliability issues due to the lack of adequately skilled personnel required to properly maintain and manage their utility operations and infrastructure. Marriott also sought to reduce the overall operating costs of the site as well as reduce their annual capital investment associated with utility operations and maintenance.

**SCOPE OF WORK:** Armstrong International conducted an initial audit of the resort's utility infrastructure to identify areas of potential energy savings. Following the audit, Armstrong generated critical KPIs to showcase potential cost avoidance and energy savings.

Armstrong operates, maintains and performs capital upgrades to self-generate power, potable water, hot water, steam and waste water for the resort. Through best practices implementation, reliability is improved, annual operating costs are reduced and annual capital spend is lowered. Armstrong tracks all required data and develops annual regulatory air and effluent permits for Marriott in order to ensure compliance.

Armstrong is responsible for operation and maintenance of the utility systems at Marriott-Frenchman's Reef, US Virgin Island site which include the following equipment:

- (2) Fulton Steam boilers 130 HP each and all associated equipment
- Associated support equipment, steam distribution system, and condensate return system
- Steam heated process hot water system
  - Operations of 3 mixing valves for tempered hot water
  - Distribution and return piping
- Complete facility chilled water systems
  - Operations of 3 Chillers, 500 300 and 200 ton units
  - Automated Tracer ES system
  - 20 chilled water units to include all Ball rooms
- Diesel powered generators and associated support equipment
  - 3 Onan generators (2) 1250 kw and (1) 900 kw
  - Electrical distribution
  - Fuel oil management
  - Required EPA reporting

#### SCOPE OF WORK CONTINUED:

- Water
  - Management of water inventory and quality
  - RO water generation management
- Waste water
  - Operations of 5 Lift stations
  - Required EPA reporting
- Project implementation
  - Seawater pipe stabilization
  - Replacement of all seawater pumps and drive units
  - Seawater system valve replacement
  - Upgrade Tracer ES
  - Overhaul of 1250 kw and 900 kw Generators
    - Fuel day tank replacement
    - Installed A/C units in electrical rooms
    - Build-up of spare parts inventory
    - Repair of Waste water lift stations
    - DA tank replacement
    - 1308/480 Transformer replacement

#### BENEFITS:

Within six months of Armstrong assuming complete O&M responsibility, Marriott recognized significant initial benefits, and ultimately achieved more than \$350,000 in annual savings by implementing the following maintenance and operational improvements:

- Diesel use down 65 gal/day (3% to date) achieved through improved boiler and hot water system operating procedures
- Restructured HVAC service contract by assuming routine maintenance tasks previously performed by OEM supplier
- Restructured Reverse Osmosis System Service Contract by assuming routine maintenance tasks that had been previously outsourced
- Through coordinated effort with Marriott, Armstrong has restructured diesel fuel supply contracts resulting in a reduction of purchase price by more than 30%

Armstrong continues to identify future utility improvement opportunities and recommend cost saving solutions. As a future improvement, Armstrong is currently evaluating the site's stack heat recovery power generation to generate 150kW from stack gas exhaust heat without emissions, fuel or chemicals to yield significant economic viability.

The Marriott Frenchman's Reef facility is staffed with Armstrong utility experts that ensure the highest level of quality, reliability and efficiency. The sense of urgency provided continues to support the plant's construction and start-up process while providing uninterrupted utility services for the existing operational requirements. The utility focus for the Marriott Frenchman's Reef facility continues to center around continuous improvement with the utmost attention paid to reducing overall utility costs.