

A background image of space featuring a large view of Earth's curved horizon on the left and the Moon in the upper right corner. The text is overlaid on a dark horizontal band across the middle.

# PRECISION ICEBLAST CORPORATION

CO2 Blasting Contractors

“World’s Leader in HRSG Cleaning”

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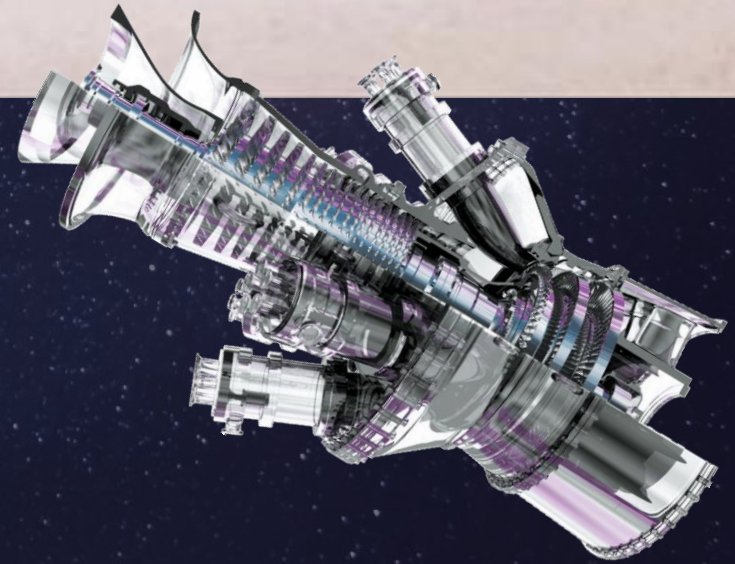
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**CASE STUDY**

**BOGUE POWER**



# Montego Bay, Jamaica



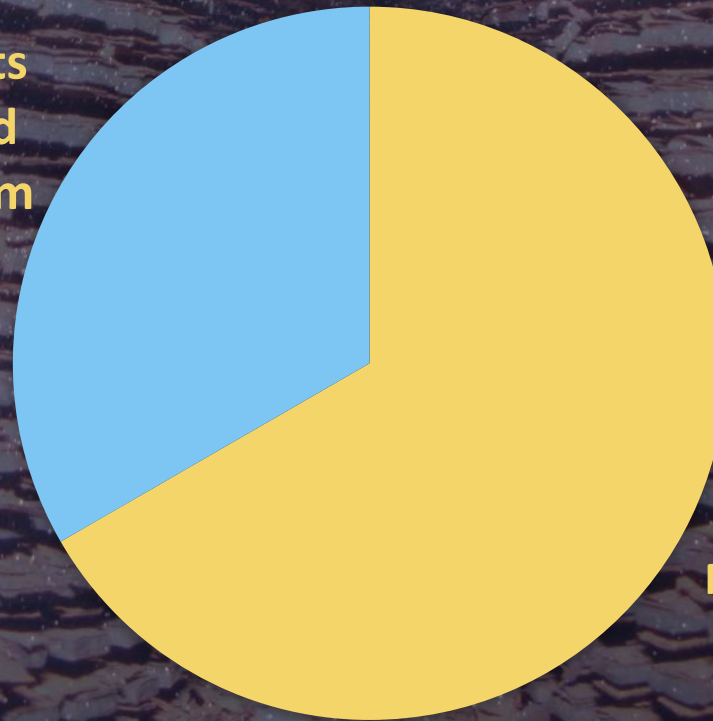
- **Commissioned in 2003**
- **2 X 1**
- **Fuel Oil Number Two**
- **Two GE 6001 B Gas Turbines**



# BOGUE POWER

## OUTPUT

40  
Megawatts  
Combined  
from Steam  
Turbine



80  
Megawatts  
Combined  
from Gas  
Turbines

120 megawatt total generation



# BOGUE POWER

## HRSG

- Two ATS Express HRSG's
- Double wide (55' x 24')
- Base load
- Horizontal Gas Flow



# BOGUE POWER

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## PROBLEMS CAUSED FROM DEBRIS FOULING

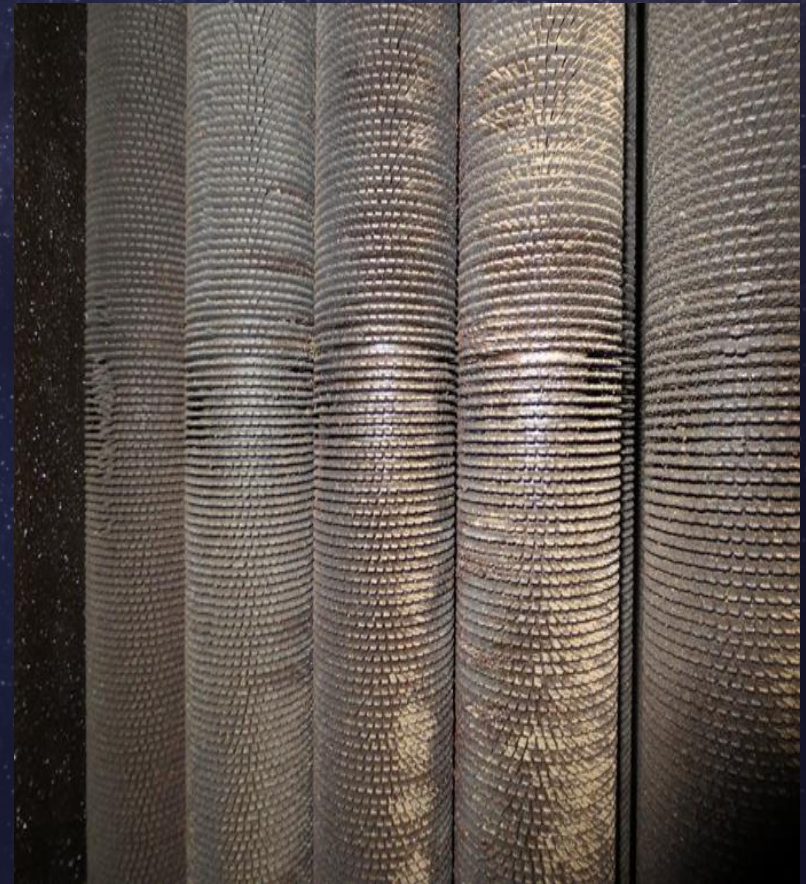
- Lower steam turbine output
- Higher fuel consumption at a lower overall plant output
- Back pressure on gas turbines
- Flue Gas Bypass



# BEFORE



# AFTER







**BEFORE**



**AFTER**





# BOGUE POWER

## GT UNIT #12 OUTPUT

### Before Cleaning

- 33.8 mega watt output
- HRSG effectiveness 77.50% (Based on 78% design effectiveness)

### After Cleaning

- 35.6 mega watt output
- HRSG effectiveness 78.2% (Based on 78% design effectiveness)





# BOGUE POWER

## GT UNIT #13 OUTPUT

- **Before Cleaning**

- 31.6 mega watt output
- HRSG effectiveness 76.32% (Based on 78% design effectiveness)

- **After Cleaning**

- 34.5 mega watt output
- HRSG effectiveness 76.95% (Based on 78% design effectiveness)





# BOGUE POWER

## STEAM TURBINE OUTPUT

- **Steam Turbine Before Cleaning**  
**34.18 mega watts output**
- **After Cleaning**  
**36.5 mega watts output**



# BOGUE POWER

## GT 12 HEAT TRANSFER



- **Stack Temperature Before Cleaning**  
**297 degrees Fahrenheit**
- **Stack Temperature After Cleaning**  
**275 degrees Fahrenheit**





# BOGUE POWER

## GT 13 HEAT TRANSFER

- **Stack Temperature Before Cleaning**  
**301 degrees Fahrenheit**
- **Stack Temperature After Cleaning**  
**289 degrees Fahrenheit**





# BOGUE POWER

## HEAT RATE

- Heat Rate before Overhaul & HRSG cleaning  
8887 btu/kwh (January to May pre cleaning 2013)
- Heat Rate after Overhaul & HRSG cleaning  
8600 btu/kwh (December post cleaning 2013)





# BOGUE POWER

## DOLLAR & CENTS

- Estimated Impact Fuel Savings of HRSG Cleaning:  
48.3 Btu/kwh
- System Fuel Savings Value of Cleaning of HRSG  
\$270,730 .00 USD (December 2013)
- Annual projected FUEL savings **\$3,248,760 USD**





# BOGUE POWER

## DOLLAR & CENTS

- Estimated Impact of increased revenues due to increase in output from cleaning HRSG
- Cumulative Output Gain of 6.01 MW from Cleaning of HRSG (350 days a year – 24 hours a day - \$470 per MW)
- Annual projected increased revenues  
**\$23,727,480 USD**