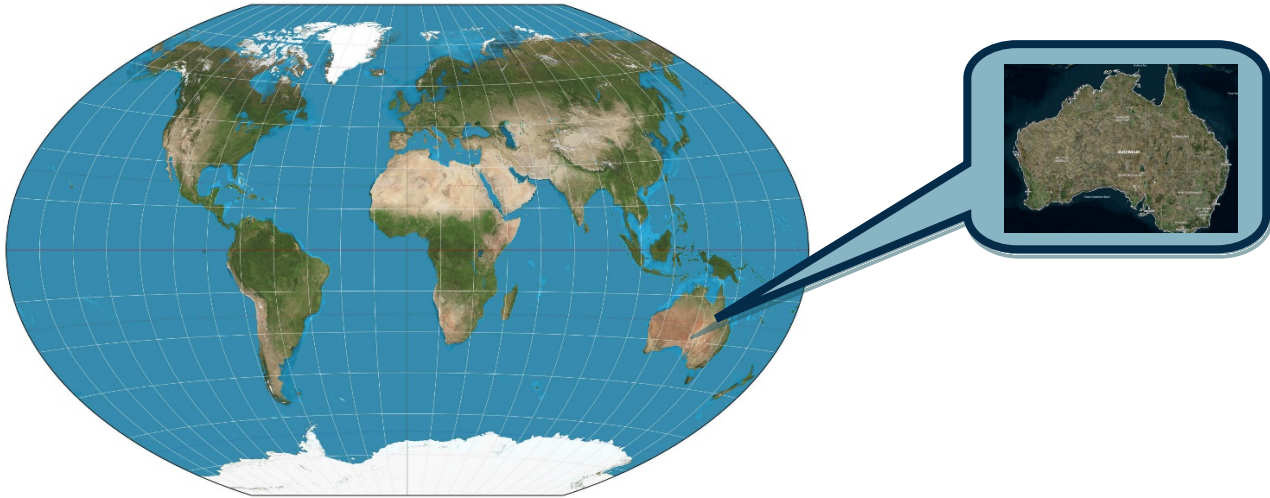


**COMBINED CYCLE POWER PLANT** **Australia** 

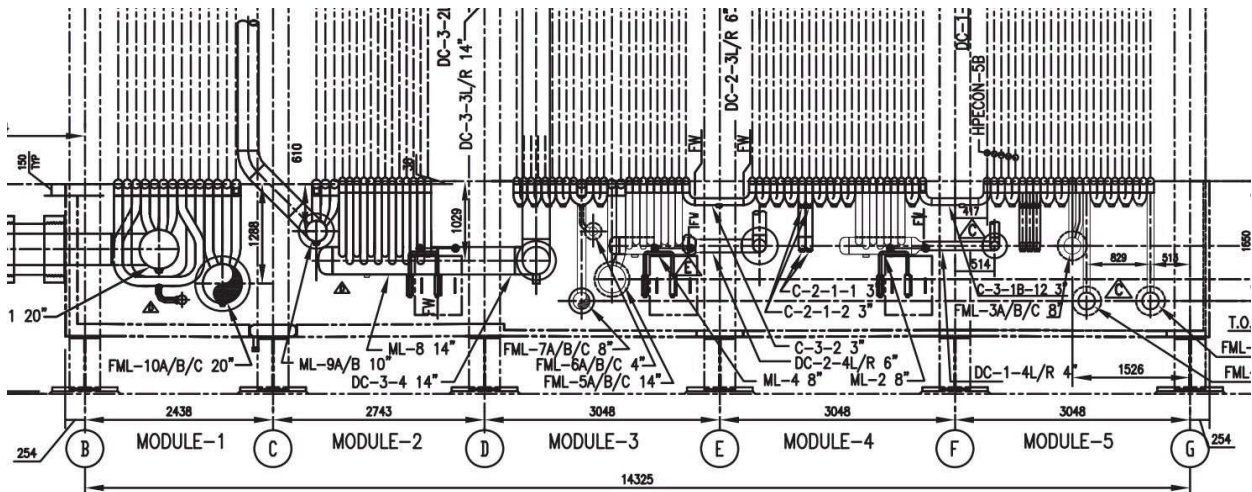
Post Cleaning Summary



**BACKGROUND:**

- 2009 Commissioned
- Natural Gas
- Horizontal Gas Flow
- Partial load: 200 days/year
- No cleaning history
- 2017 June: PIC Deep Cleaning™
- 5 Modules Cleaned
- 24 rows largest module 3 m depth

HRSG	GT & Design	Output
<ul style="list-style-type: none"> <li>• Alstom STF 15C</li> <li>• Triple wide (90' x 36')</li> </ul>	<ul style="list-style-type: none"> <li>• Alstom GT26 Gas Turbine</li> <li>• 1 X 1</li> </ul>	<ul style="list-style-type: none"> <li>• 260 MW GT / 160 ST</li> <li>• 420 MW Total</li> </ul>



## **ASSESSMENT: HRSG fouling causing issues**

- Loss of MW output from design
- Reduced thermal efficiency
- Increased back pressure on gas turbine
- Increased fuel consumption
- Increased stack temperature
- Debris particulates exiting the stack The unit was showing fouling primarily in the last two modules

## **CLEANING RESULTS: Benefits to the Plant**

### **Output**

Before	After	Change
407.4 MW	412.6 MW	+ 5.4 MW (+0.72%)

### **Stack Temperature**

Before	After	Change
94.5 C	90.0 C	- 4.5 C

### **Heat Rate: (Thermal Energy In / Electric Energy Out)**

Before	After	Change
7070.93 kJ/Kwh	6975.40 kJ/Kwh	- 95.53 kJ/Kwh

## **FINANCIAL BENEFITS:**

### **Fuel Savings**

Impact Fuel Savings	Fuel Savings	Annual Savings Estimate
- 36 GJ / hour	267.00 USD / hour	\$1,281, 600.00 USD

- 200 days x 24 hr./day x 267.00 / hour

### **Increased Output Revenue**

Increased Output	Estimated US \$ / MW	First Year Revenue Increase
+ 5.4 MW	\$70.00	\$1,814,400.00 USD

- (200 days x 24 hr/day x 5.4 MW/hour x \$70.00)

## **SUMMARY:**

- The clean HRSG is estimated to keep these benefits for approximately 4-5 years until the next cleaning and even at a 10-15% decrease per year the benefits are very substantial. Payback on PIC services was less than 60 days.