

CHP Gas Turbine Solutions

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Project Applications Engineer

May 7, 2008

- **Corporate Profile**
- **PG Products**
- **Project Applications Support**
- **Aftermarket Support**

- **Subsidiary of Caterpillar Inc. since 1981**
- **Over 6000 Employees Worldwide**
- **43 Service Locations**
- **13 Overhaul / Repair Centers**
- **Presence in over 96 Countries**



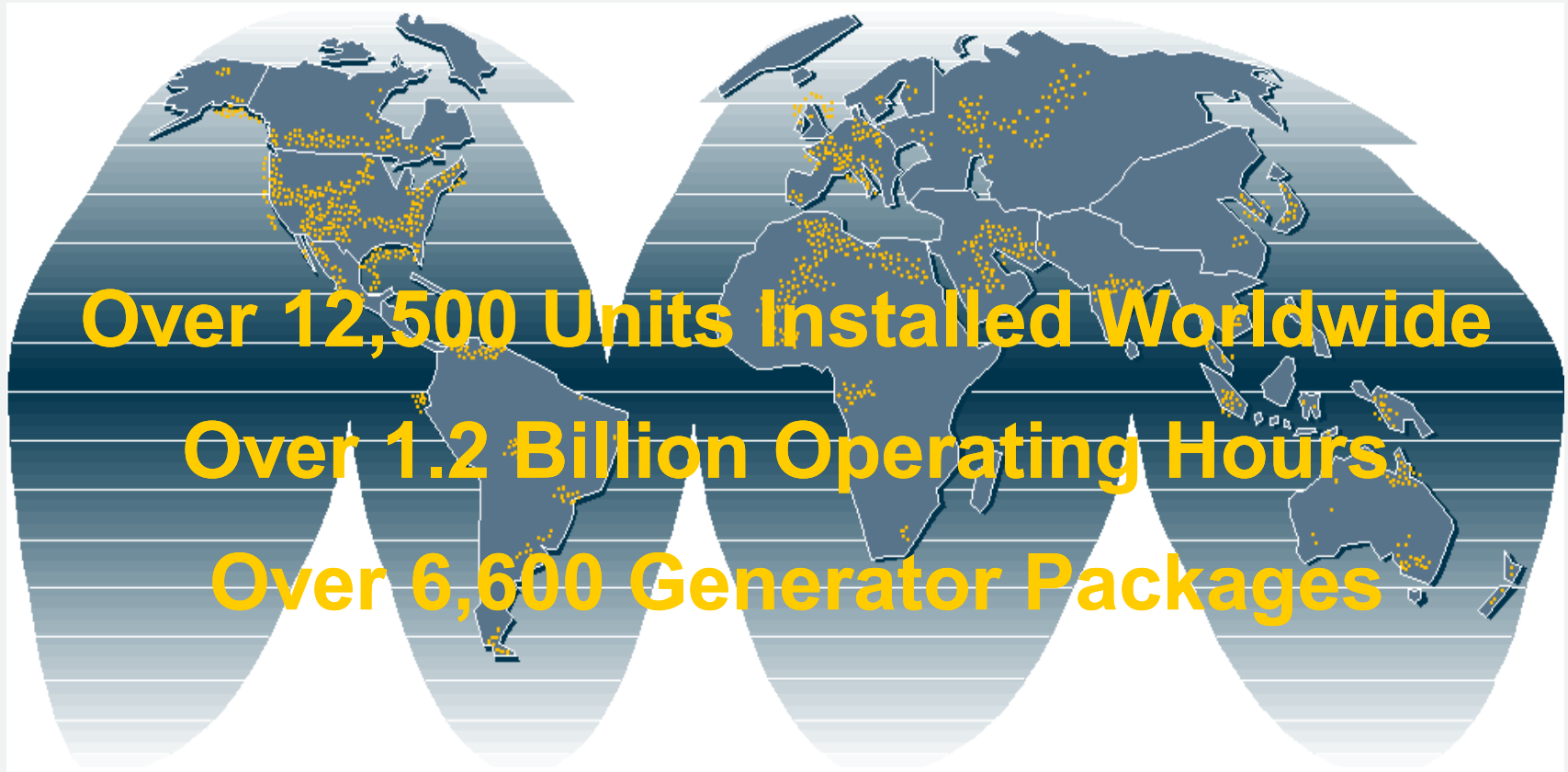
San Diego, California





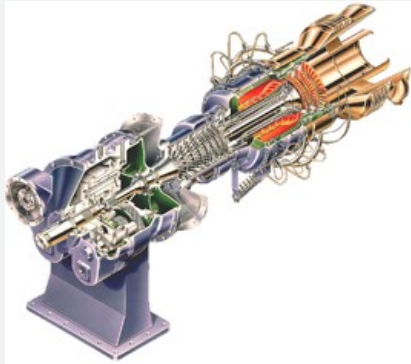
San Diego, California





CHP in California

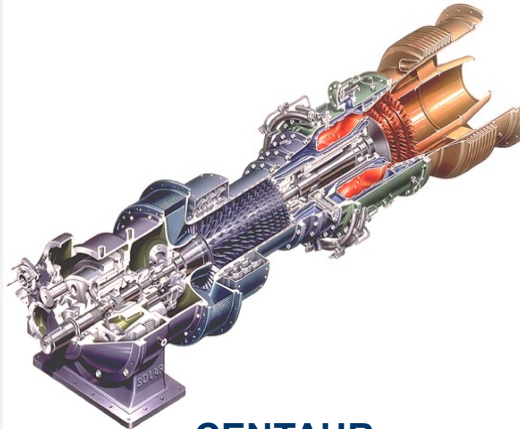
| Model | Qty | Year | Site | Market |
|-----------|-----|----------|----------------------|-------------------------------|
| Multiple | 54 | pre 2000 | Multiple | Multiple |
| Centaur40 | 1 | 2000 | Fresno | Health Care Facilities |
| Titan130 | 2 | 2000 | La Jolla | Educational Services |
| Centaur40 | 1 | 2001 | Fresno | Health Care Facilities |
| Taurus70 | 1 | 2002 | Paramount | Refinery |
| Taurus60 | 2 | 2002 | San Diego | Educational Services |
| Titan130 | 1 | 2002 | Fullerton | Forest Products |
| Centaur50 | 1 | 2002 | Bakersfield | Refinery |
| Mars100 | 1 | 2002 | Pasadena | Educational Services |
| Centaur50 | 1 | 2002 | Naval Medical Center | Health Care Facilities |
| Centaur40 | 1 | 2004 | San Diego | Health Care Facilities |
| Centaur50 | 1 | 2004 | Martell | Other - Industrial |
| Centaur50 | 1 | 2005 | Tipton | Food Processing |
| Mercury50 | 1 | 2005 | San Diego | Communications/IT Facilities |
| Taurus60 | 2 | 2005 | Victorville | Electric Power Plant |
| Mercury50 | 1 | 2006 | San Diego | Communications/IT Facilities |
| Taurus60 | 1 | 2006 | Victorville | Electric Power Plant |
| Taurus65 | 1 | 2007 | Pixley | Food Processing |
| Mercury50 | 1 | 2007 | Temecula | Hotels, Resorts and Casinos |
| Centaur40 | 1 | 2007 | Visalia | Health Care Facilities |
| Taurus60 | 2 | 2008 | Santa Ana | Electric Power Plant |
| Taurus60 | 1 | 2008 | Tupman | Chemicals and Allied Products |
| Total | 79 | | | |



SATURN

Saturn 20

1 210 kWe



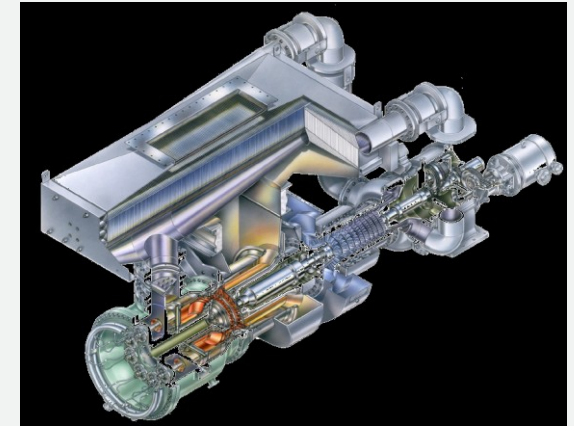
CENTAUR

Centaur 40

3 515 kWe

Centaur 50

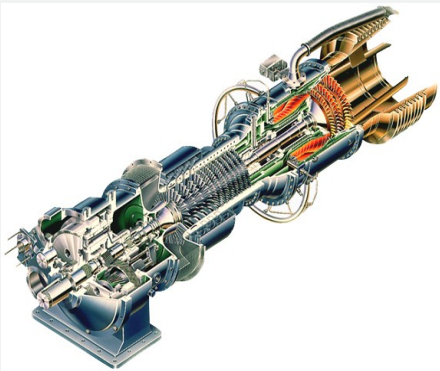
4 600 kWe



MERCURY

Mercury 50

4 600 kWe



TAURUS

Taurus 60*

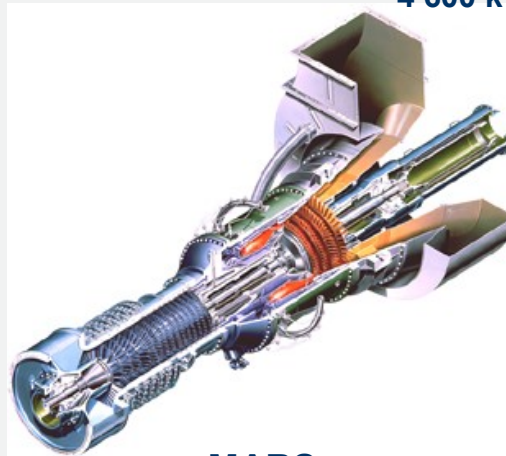
5 670 kWe

Taurus 65

6 300 kWe

Taurus 70

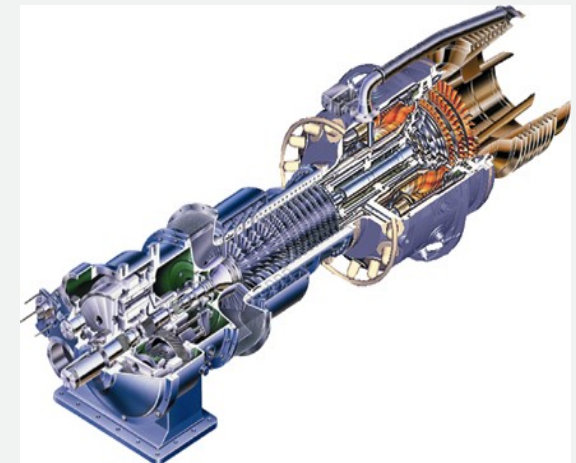
7 520 kWe



MARS

Mars 100

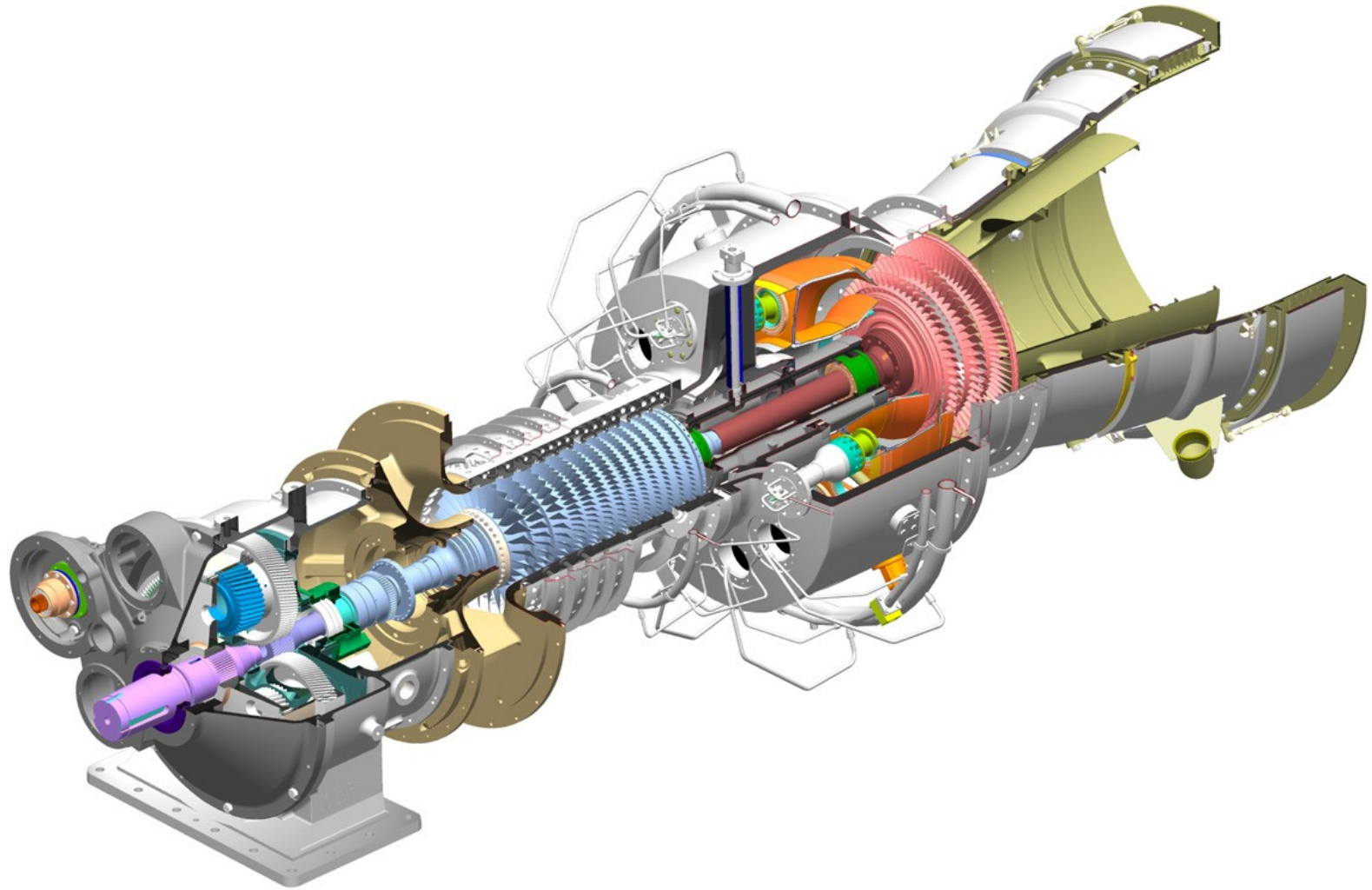
10 695 kWe

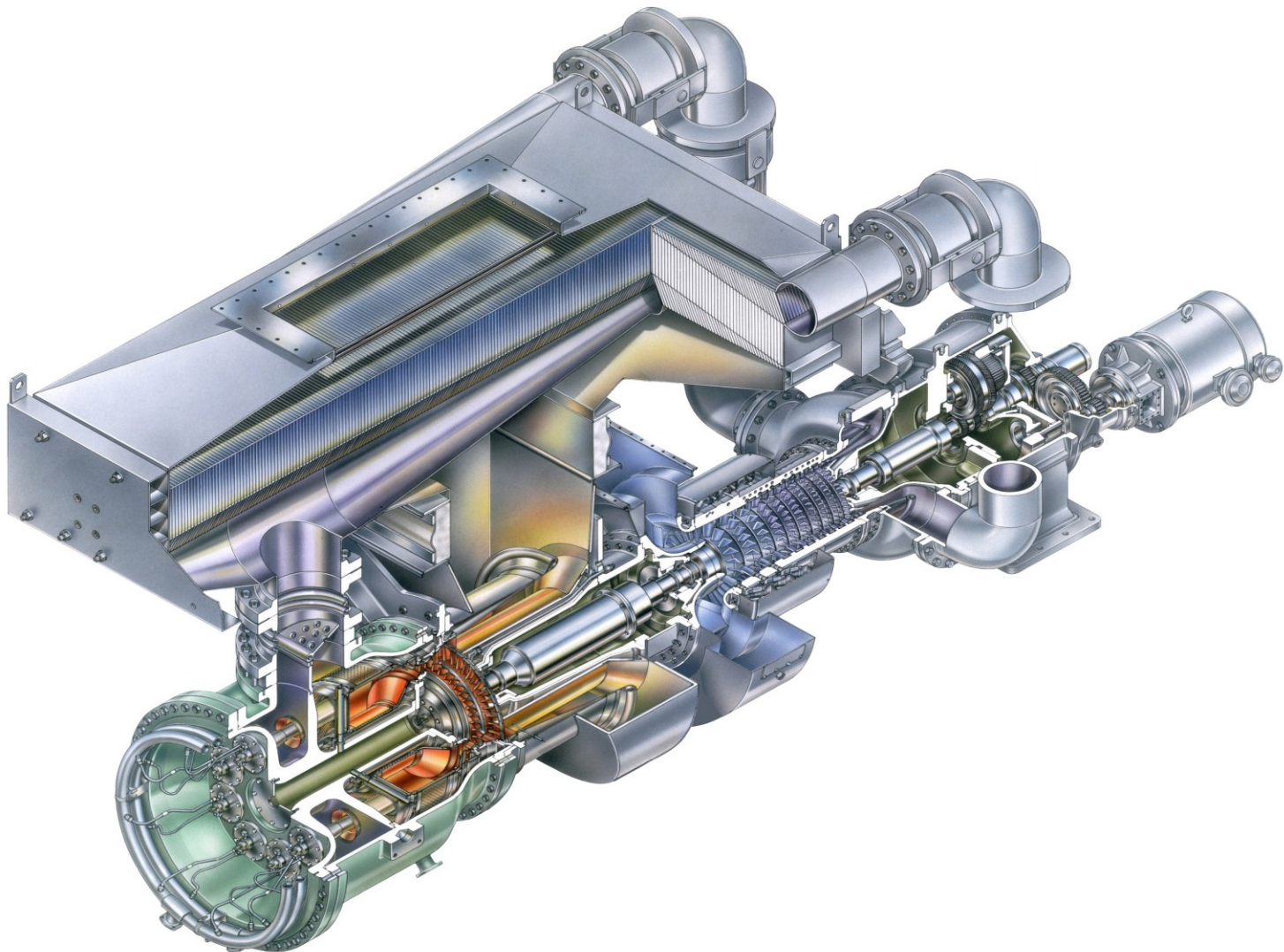


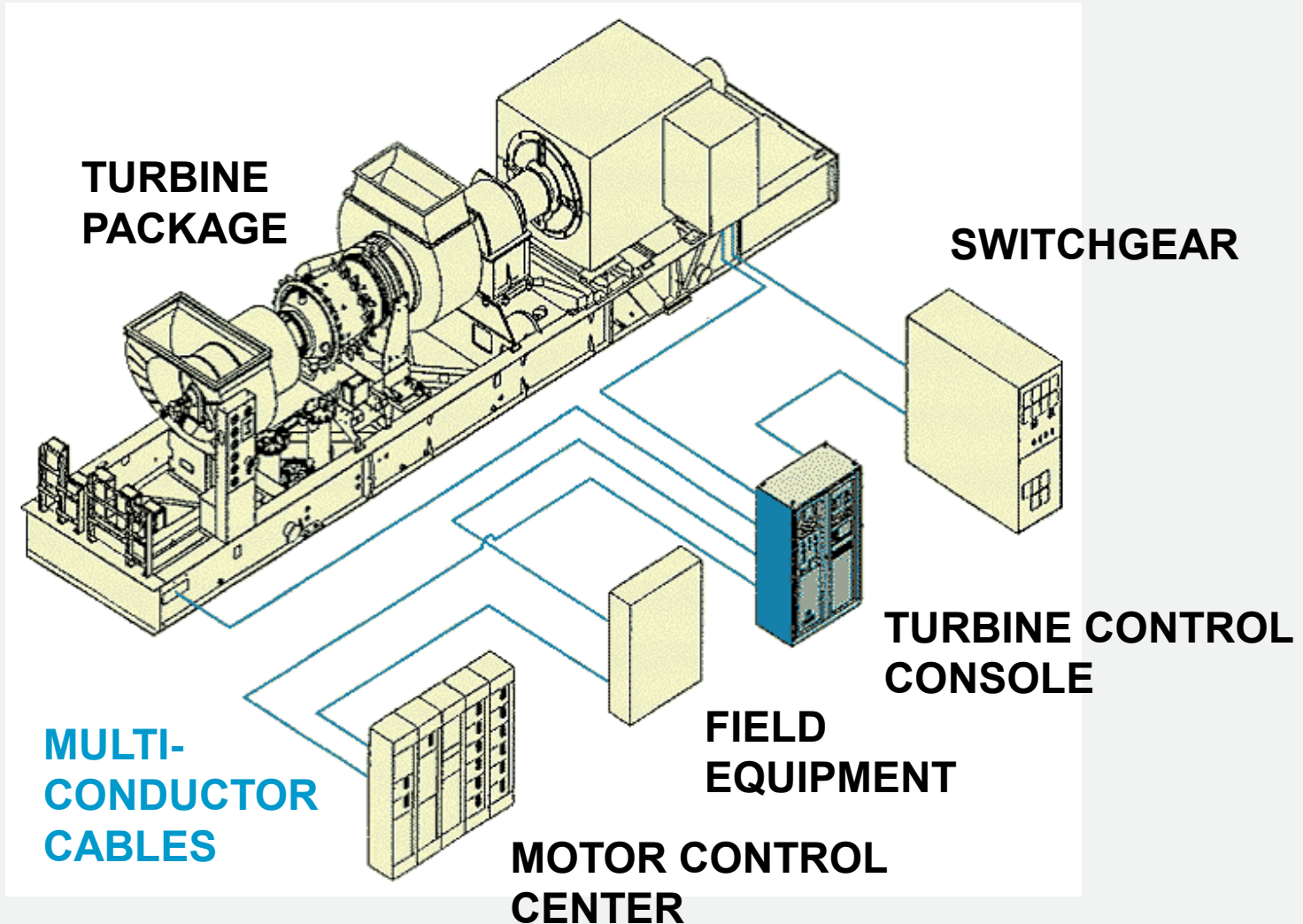
TITAN

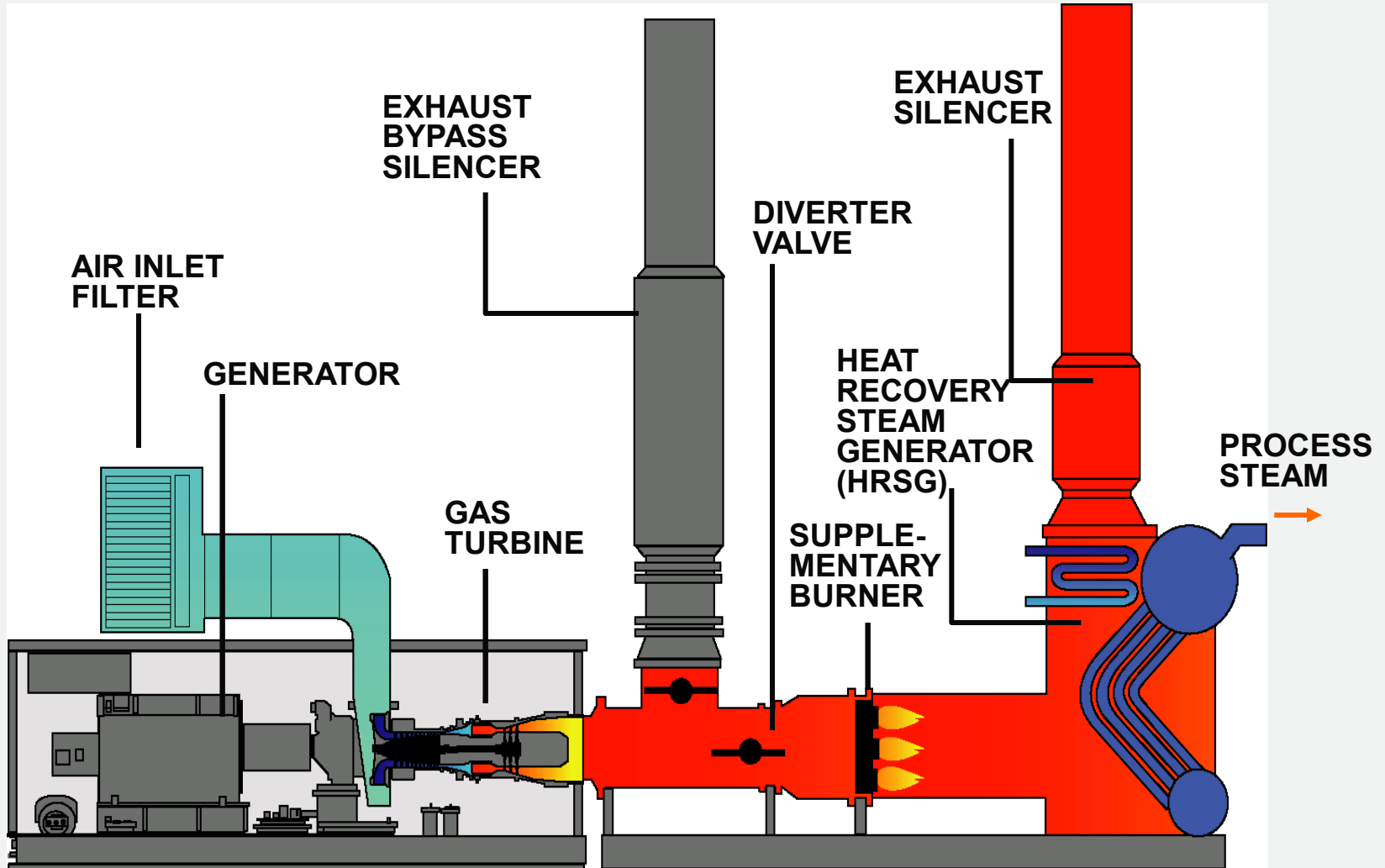
Titan 130*

15 000 kWe









| Product | ISO Power MWe | ISO Heat Rate Btu/kW-hr | Site Specific Performance – Thousand lbs/hr | | | | |
|------------|------------------|----------------------------|---|--------------|------------------|-----------------|-----------------|
| | | | Exhaust Temp. °F | Exhaust Flow | Steam Production | | |
| | | | | | Output Unfired | Fired to 1600°F | Fired to 2800°F |
| Centaur 40 | 3.5 | 12 240 | 835 | 149.6 | 19.6 | 53.3 | 113.2 |
| Centaur 50 | 4.6 | 11 630 | 956 | 150.3 | 25.3 | 53.0 | 112.4 |
| Mercury 50 | 4.6 | 8 863 | 710 | 140.4 | 13.8 | 49.4 | 104.4 |
| Taurus 60 | 5.7 | 10 860 | 960 | 171.3 | 29.8 | 62.0 | 130.5 |
| Taurus 65 | 6.3 | 10 373 | 1032 | 163.4 | 32.1 | 60.5 | 128.3 |
| Taurus 70 | 7.5 | 10 100 | 914 | 212.3 | 34.4 | 76.1 | 158.6 |
| Mars 100 | 10.7 | 10 520 | 915 | 329.1 | 51.8 | 117.4 | 248.1 |
| Titan 130 | 15.0 | 9 695 | 932 | 392.2 | 64.5 | 141.4 | 298.2 |

ISO Performance: 59°F; Sea Level; No Inlet and Exhaust Losses.
 Specific Site Performance: 3 in. Inlet, 7 in. Exhaust Losses; Saturated Steam @ 150 psig

- **Emissions:**

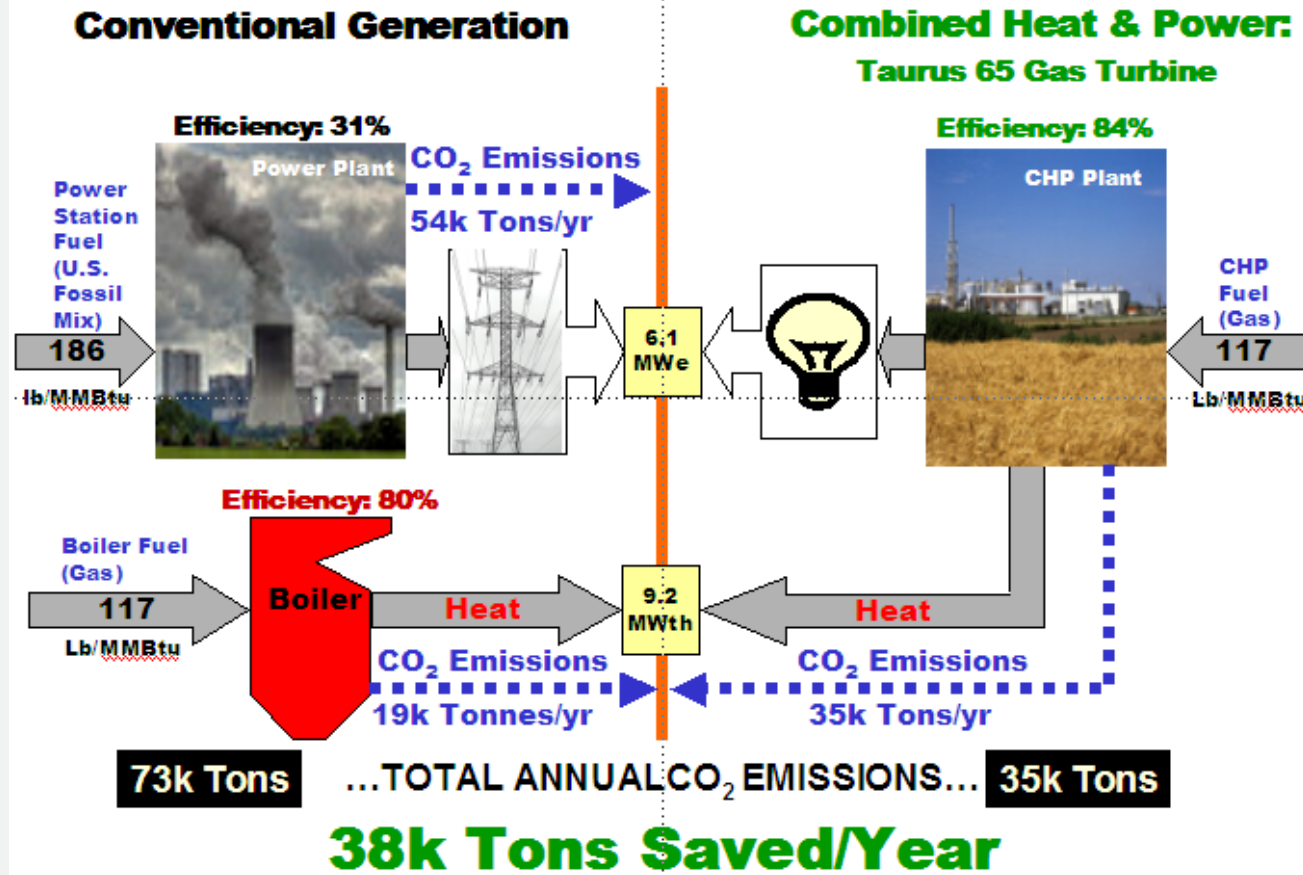
| | |
|----------------|---------------------------------|
| Gas: | 15 ppm NOx, 50 ppm CO |
| (M50) | 5 ppm NOx, 10 ppm CO |
| Liquid: | 96/74 ppm NOx, 50 ppm CO |

- **Load Range:**

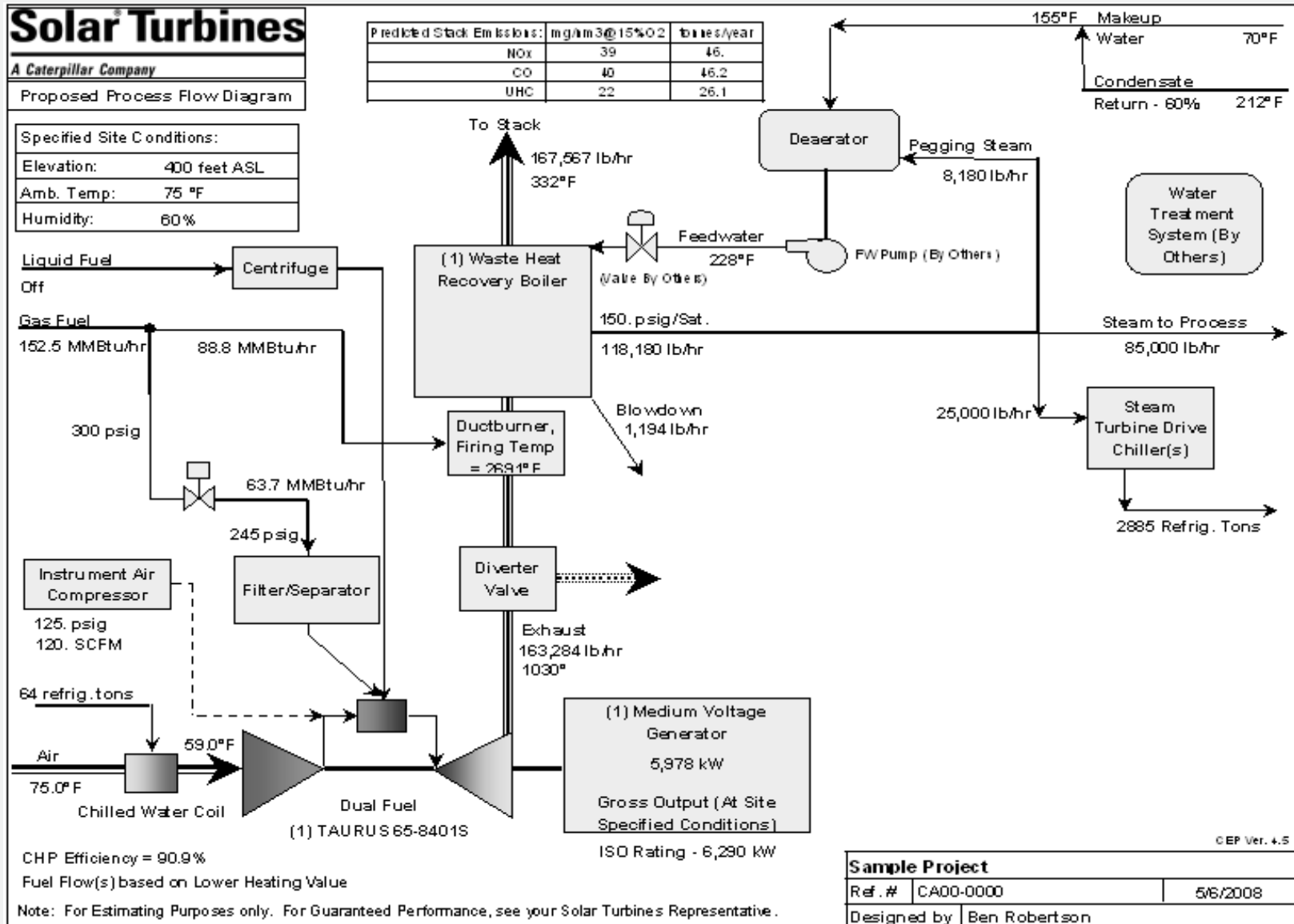
| | |
|----------------|---------------------|
| Gas: | 50-100% Load |
| Liquid: | 65-100% Load |

- **Ambient Temperatures: 0-120 Deg F**

CO₂ Emissions Reductions from CHP



- **Review Site/Operating Conditions**
 - Elevation, Temperature, Humidity
 - Electrical & Thermal Load variations
 - Available fuel types, pressures, and treatments
 - Layout and regulatory constraints
 - Hardware, software, and training, and support needs
- **Provide practical solutions tailored to specific needs for maximum value.**



~200 Gensets (1.5 GW) sold over past two years

- 315 MW US/Canada
- 130 MW Latin America
- 45 MW Australasia
- 565 MW Europe
- 75 MW FSU
- 305 MW Asia
- 105 MW Middle East

- **Training**
 - At factory and on site
- **Field Service**
 - 850 Field Technicians
- **Service Parts**
 - 7 warehouses worldwide
- **Performance Monitoring**
 - 24h hour satellite performance monitoring
- **Extended Service Agreements**
 - Complete with periodic maintenance and overhauls



Solar Has the Capabilities to Meet Your Electrical and Thermal Needs with High Quality, Clean-Burning Gas Turbines and Unmatched After-Market Support Worldwide.