

# SCR & CO CATALYST SYSTEMS

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NOx & CO Reduction | Flow and Temperature Management | Controls  
Ammonia Injection | Silencing | Thermal Stress Analysis



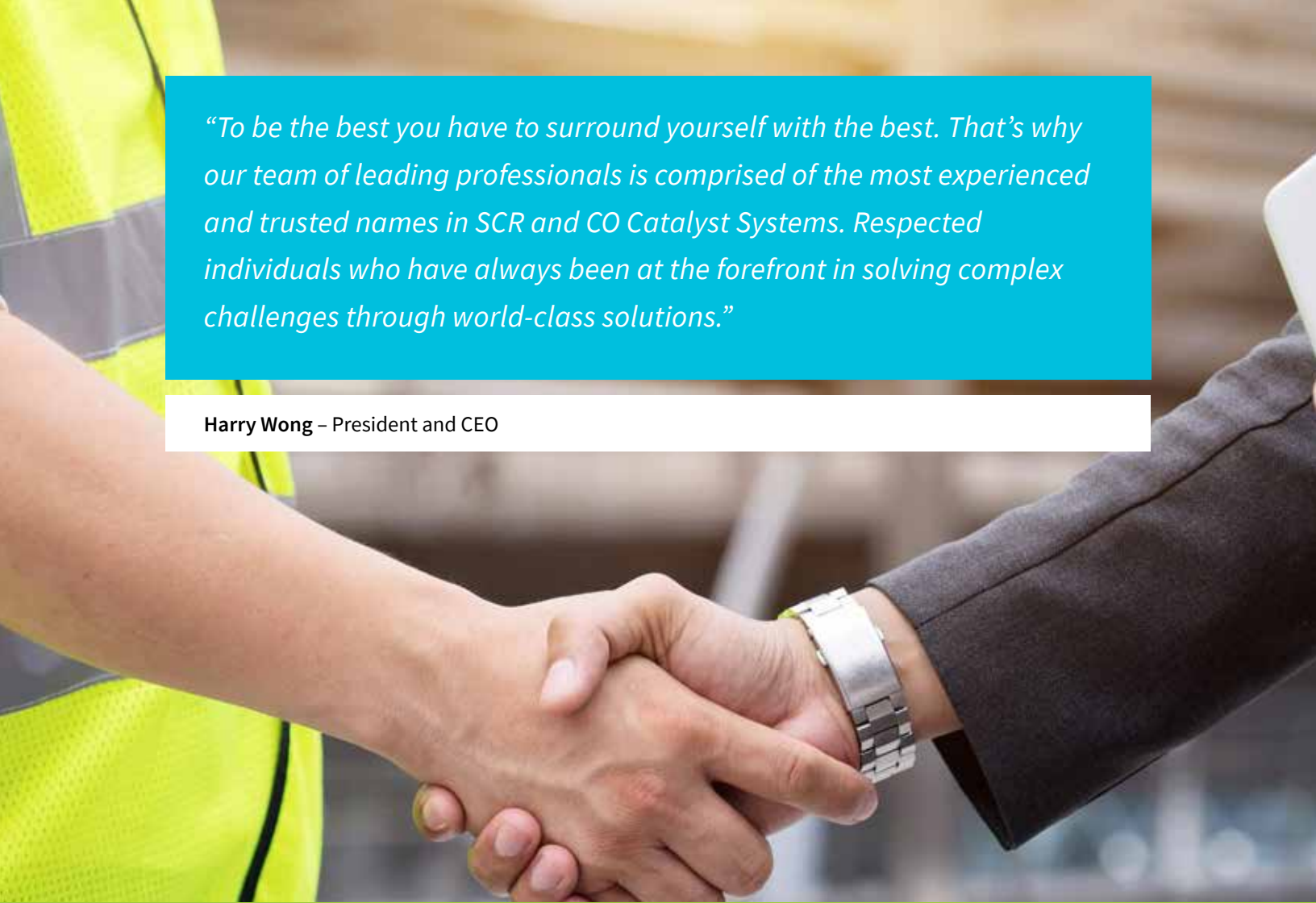
**ENERGYLINK**  
INTERNATIONAL

CONNECTING YOU TO A BETTER WAY

# YOUR TRUSTED PARTNER

Being a Partner of Choice is the foundation EnergyLink International has been built upon. For today's leading organizations, we are a preferred partner for SCR and CO Catalyst Systems because we put you first. We know our valued client's reputation is supported by our reputation. An earned reputation for delivering quality, performance and value. This is a trust that is never taken for granted and is why we continuously go above and beyond to deliver more – providing a dependable and seamless experience that is synonymous with the EnergyLink International name. Our demonstrated areas of expertise include:

- Catalyst Oxidation Systems for Carbon Monoxide (CO) Removal
- SCR Catalyst Systems for Nitrogen Oxide (NOx) Removal
- Performance to your exact specifications
- Improved system efficiencies
- Compact system footprints
- Greater air pollution control
- Acoustic designs to the most difficult criteria



*“To be the best you have to surround yourself with the best. That’s why our team of leading professionals is comprised of the most experienced and trusted names in SCR and CO Catalyst Systems. Respected individuals who have always been at the forefront in solving complex challenges through world-class solutions.”*

**Harry Wong** – President and CEO

# ADDING VALUE AT EVERY STAGE

When we say partner, we mean it. Not only are we committed to delivering the best solutions possible, we look at every aspect of the project to provide optimum value for our customers. Whether it is with greater efficiencies, uncompromised expertise, dependable hands-on experience or through strategic and insightful negotiations so we can pass on much lower costs, the value we deliver is broad and far reaching and will continue to push us to deliver even more. The following is a sample of the value-added solutions we can provide:

## Selective Catalytic Reduction for NOx Reduction:

- Our Selective Catalytic Reduction (SCR) team is simply the best in the industry, providing proven performance and guaranteed compliance while meeting the strictest of emissions standards
- We can provide low cost SCR systems with OEM-level high quality manufacturing resulting in affordable ultra-high performance systems
- Experience in design, supply, installation and commissioning for fired heater, boiler and gas turbine/heat recovery steam generators (HRSG)
- Highly experienced technical managers are available to pre-commission, balance ammonia injection grids, and successfully commission and maintain SCR systems around the world.

# MARKET EXPERTISE

Today's operations are facing added pressures to reduce emissions while remaining productive and efficient. For EnergyLink International, passion drives our environmental solutions to not only meet but exceed the most stringent local and international regulatory standards. Our team of leading professionals have designed, manufactured and installed the most advanced solutions in Catalyst Systems across a variety of industries around the world, including:

- Gas Turbine Power Plants
- Natural Gas Processing
- LNG Liquefaction
- Petrochemical
- Refineries

*“Never settling, going further and delivering the most advanced solutions possible for SCR and CO Catalyst Systems is what continues to define EnergyLink International and makes us a leader throughout our ever-evolving industry segments.”*

**Denise LeClaire** – Senior Director,  
Business Development





# A RESPECTED LEADER

At the core of EnergyLink International is a team of highly respected professionals in catalyst systems with a variety of disciplines. Recognized leaders who are at the forefront of our ever-changing industries and backed by a diverse portfolio of hands-on domestic and international experience. Further strengthening our team is their strong commitment to going further and achieving more for our valued clients.

As such, EnergyLink International prides itself on our in-house engineering capabilities supporting Catalyst technologies. Further complementing our well-known exhaust structural engineering prowess, EnergyLink International designs control systems, analyses flow by using state of the art CFD modeling, makes structural decisions by using elaborate finite element analysis, meets customer's noise criteria by using sophisticated acoustic design programs and creates our own electrical and mechanical designs.

The following showcases our combined team experience and demonstrated technical expertise in solving complex challenges with value-added solutions.

- Involvement with more than 175 SCR and CO Emissions Control Systems as well as over 1,168 Exhaust Systems
- Experience spans from small aero-derivatives to large frame sized machines and virtually all gas turbine configurations
- Leading experts in NOx CO Reduction, Flow and Temperature Management, Ammonia Systems, Controls, Silencing and Thermal Stress Analysis
- Achieving 96% NOx removal with 5 ppm ammonia slip and 100% regulatory compliance
- Advanced technologies and proven designs achieves 99% NOx removal

## Gas Turbine Exhaust List of our Team's Combined Experience.

GT SIZE	#
ABB GT24/26	12
ABB GT10B2	1
GE LM2500	26
GE LM5000/6000	373
GE Frame 5	29
GE LMS100	48
GE Frame 6B	73
GE Frame 6FA	3
GE Frame 7EA	354
GE Frame 7FA	108
GE Frame 9EA	62
GE Frame 9FA	25
GT11/13	46
Pratt & Whitney FT8-TP	2
Siemens V84.2	4
Siemens V84.3A	3
Siemens V94.2	11
Siemens V94.3A	8
Siemens 501F	20
Siemens 701F	11
Siemens SGT-A65 (Trent 60)	7
Siemens RB211	1
Solar Taurus60	2
Solar Mars100	2
Solar Mars130	1
Solar Titan250	7
Westinghouse 501AA	6




## Emissions Control System List of our Team's Combined Experience

GT MAKE & MODEL	PLANT TYPE	#
GE Frame 7H	CCGT	2
GE Frame 7FA.04	SSGT	1
GE Frame 7FA	CCGT	19
GE Frame 7EA	CCGT	4
GE Frame 5	CCGT	3
GE LMS100	SSGT	6
GE LM6000	SSGT	79
GE LM6000	CCGT	3
GE LM6000PC	SSGT	16
GE LM6000PF	SSGT	5
GE LM6000R	SSGT	2
GE LM2500	CCGT	1
MHI 501G	CCGT	3
Westinghouse 501D	CCGT	3
Westinghouse 501F	CCGT	2
Solar Mars 100	SSGT	6
Solar Taurus 70	SSGT	1
Solar Taurus 60	CCGT	3
Solar Centaur 50	CCGT	2
Solar Titan 250	SSGT	12
Solar Titan 130	SSGT	2
Pratt & Whitney GT8	SSGT	4


# GUARANTEED PERFORMANCE

At EnergyLink International we proudly stand behind everything we do. Period. That's why we offer an unparalleled guarantee on air emissions control solutions. Through our proven designs, extensive experience and advanced analysis, our team of leading experts will not only meet, but exceed, the most stringent air emission standards throughout the world.



*“There are those who say it can be done and those who have the proven expertise and hands-on experience to actually do it.”*

**Jeff Wirt – Director,  
Catalyst Systems**



*“Right from the start of every project, we know we are setting an example and through our detailed planning, collaborative approach and disciplined execution, we leave nothing to chance to ensure the highest standards possible.”*

**Aaron Atherton** – Project Manager

## CATALYST SELECTION

Selection of the correct catalyst is critical to meeting performance guarantees, while optimizing the system design. At EnergyLink International, we are there right from the start. Through relationships with all key catalyst suppliers, an in-house team with proven catalyst system project experience and complete technical and operational knowledge of all critical selection variables, we can work with you to ensure the most advanced solutions tailored to your specific requirements.

In addition, EnergyLink International possesses the unique capability of performing all catalyst system design functions under one roof. This ability allows us to balance and optimize between pressure drop, acoustical performance and emissions requirements seamlessly, resulting in:

- Mitigated risk, due to single point responsibility
- Reduced cost and/or higher performance from design balancing
- Improved project execution



# DESIGN EXPERTISE

As respected leaders, our team averages more than 100 years of direct design experience working with one of the largest and most diverse portfolio of gas turbine system applications. Through our investment in time and resources we are further able to engage in leading-edge design development activities that put us in the forefront of the catalyst market.

Some of these key design features, which are further complemented by our team's project experience, include:

- Unique ammonia injection grid design for more efficient exhaust gas/ammonia mixing
- Superior sealing of catalyst to frame and liners to prevent untreated exhaust gas by-pass
- Design confirmation through CFD and physical flow models
- Improved system efficiencies, resulting in more compact system foot-print, reduced cost and lower pressure drop
- Fast-start ammonia injection system development
- Critical low frequency or octave band noise attenuation
- Modular construction for easy shipment and site erection

All system elements are designed using our in-house engineers and state-of-the-art software, including:

- Finite element analysis
- Computational fluid dynamic analysis
- Acoustic design
- Structural / mechanical design



*“It’s all about the details.  
Ensuring everything is  
planned and designed  
for so that our solutions  
achieve optimal results.”*

**Alan Monshaugen –  
Manager, Design Drafting**

A photograph of an industrial facility featuring large, silver, insulated pipes. One pipe curves from the top left towards the center, while another runs vertically on the right. The background shows a building and a utility pole under a clear sky.

# FLOW MANAGEMENT

EnergyLink International's extensive team experience in modeling, managing and distributing flows of hot gases is directly applicable to catalyst systems. In the current environment of high conversion efficiencies and low ammonia slip levels, proper flow distribution is absolutely essential to catalyst system performance. We model all NOx and CO catalyst systems to verify proper flow distribution through the catalyst, ensuring that specified reduction levels are met. Total system pressure drop is also a key design consideration which is controlled by proper design of the ductwork and silencing systems.

# AMMONIA SYSTEMS

EnergyLink International has extensive experience with both aqueous and anhydrous ammonia systems and can supply either type to meet your plant needs. We can also supply urea-based systems if required. Our usual scope of supply includes ammonia/air dilution skid, ammonia piping and balancing header and Ammonia Injection Grid (AIG). The skids come completely shop fabricated, insulated and wired for fast and simple installation at the job site.

Design of the AIG is of vital importance to obtaining proper ammonia to NOx distribution. Proper ammonia to NOx distribution entering the SCR catalyst is the only way to assure that permitted outlet NOx and ammonia slip levels are achieved. This is even more important in today's regulatory environment as requirements are made more stringent.


*“Having that proven history of working with a wide variety of applications and knowing all of the intricacies to produce superior products continues to set us apart.”*

**Ken Thompson –**  
Director, Manufacturing



# CONTROLS SYSTEMS

All of EnergyLink International's simple cycle catalyst systems include a PLC-based control system. Most are configured to communicate with the gas turbine controls and the plant's continuous emission monitoring system. These control systems are completely wired, assembled and shop tested to assure easy installation and trouble-free startup. Our control engineers can configure a control system to meet any specific project requirements.



*“Expectations are high, and they should be. That’s why we continually invest our time and resources to ensure our customers receive even greater value-added solutions throughout every stage of the project.”*

**Ron Brown** – Manager, Procurement and Logistics

# SILENCING AND THERMAL STRESS ANALYSIS

Noise attenuation is often critical to the design of catalyst systems since many sites are located in areas with stringent noise restrictions. EnergyLink International's in-house acoustic engineers have designed many systems to meet challenging low-noise criteria. Predicted acoustic performance is verified by field- testing. We also perform finite element analyses in designing silencer panel frames to withstand the thermal stresses of simple cycle peaking applications. These measures assure our customers that the systems we supply will meet their acoustical requirements continuously and reliably.

# SUPERIOR QUALITY CONTROL

From concept to design and manufacturing, quality is priority one. Through our expansive network, we successfully manage local, national and international sub-vendor fabrication facilities to provide real value by ensuring lower cost fabrication that meets and exceeds even the most stringent OEM requirements by:

- Providing extensive fabrication process and technical training
- Local sourcing of materials
- Establishment of a critical features list and inspection hold points
- Extensive QC documentation

We are uncompromising when it comes to the installation and thorough testing of our equipment. Our air emissions equipment has never failed and continues to perform beyond the life expectancies of competitive systems.

## Add-On Products:

- Filter Houses
- Inlet Air Cooling Systems
- Anti-Icing Systems
- Inlet Silencers
- Exhaust Diffusers
- Expansion Joints
- Diverter Dampers
- Exhaust Silencers
- Exhaust Stacks

## Additional Services:

- Noise Control
- Air Emissions Testing and Monitoring
- Performance Enhancements
- Troubleshooting
- Retrofit Services



*“A well thought out and controlled execution ensures a safe and productive environment that produces greater efficiencies and overall value that can be passed on to our clients.”*

**Mike Waugh** – Construction Manager



# DEMONSTRATED EXPERTISE

EnergyLink International's team is a recognized leader with gas turbine technologies. The following is a comprehensive list of the extensive experience our members have with different types of gas turbines.

## SIEMENS

- SGT5-9000HL
- SGT5-8000HL
- SGT5-8000H
- SGT6-9000HL
- SGT6-6000G (W501G)
- SGT5-4000F (V94.3A)
- SGT6-4000F (V84.3A)
- SGT6-8000H
- SGT6-5000F (W501F)
- SGT6-3000E (501D5A)
- SGT5-2000E (V94.2)
- SGT6-2000E (V84.2)
- SGT-900 (W251)
- SGT-800
- SGT-750
- SGT-700
- SGT-500 (ABB GT-35)
- SGT-600 (Alstom GT-10)
- SGT-400 (Cyclone)
- SGT-300 (Tempest)
- SGT-200 (Tornado)
- SGT-100 (Typhoon)
- KG2
- SGT-A65 (Industrial Trent 60)
- SGT-A45
- SGT-A35 (Industrial RB211)
- SGT-A05 (Industrial 501-K)
- DR50G
- DR61
- DR990
- RLM1600
- Avon (Coberra)
- SGT 1000 F
- SGT 3000 F
- V64.3A
- V84.2
- V84.3
- V84.3A
- V94.2
- V94.3A

## GENERAL ELECTRIC

- Frame 9HA.01 / 9HA.02
- Frame 7HA.01 / 7HA.02 / 7HA.03
- Frame 9F.05
- Frame 9F.03 / 9F.04
- Frame 7F.05
- Frame 7F.04
- Frame 9E.03 / 9E.04
- Frame 7E.03
- GT13E2
- Frame 6F.03
- Frame 6F.01
- Frame 6B.03
- Frame 5
- GT 11N1
- GT 11 N2
- GT 13E2
- GT 24
- GT 26
- GT 40
- LMS 100
- LM 1500
- LM 1600
- LM 2500
- LM 6000
- 11 N2
- 13 E2
- ABB 11 N
- ABB 11D2
- ABB 11 N2
- ABB 13 D
- ABB 13 E1
- ABB 13 E2
- ABB GT 24
- Alstom GT 11N2
- Alstom GT 13E2
- Alstom GT26
- Alstom GT 8
- Alstom GT13E2
- Alstom GT26B
- F9FA
- Nuovo Pignone PGT 25
- Nuovo Pignone PGT 16

- Nuovo Pignone PGT 10
- TCPL LM 500
- Trent 60

## GM – ALLISON GAS TURBINE

### OPERATIONS

- Allison 501

### ORENDA

- OT 3
- OT F 390

### CENTRAX

- 4 MW

### DRESSER RAND

- DR 61
- DR 990

### HITACHI

- 6541
- H25

### MITSUBISHI HITACHI

### POWER SYSTEMS

- M 501 F
- M 701F4
- M 701 F5
- M 701 F
- M 501 J

### PRATT AND WHITNEY

- FT 4C– 1 DLF
- FT 8

### ROLLS ROYCE

- 501K
- 501 KB5
- 501 KB7
- 501 KC5
- 501 KC7
- Avon
- Coberra 2000
- RB211
- Trent

## SOLAR TURBINES

- Titan 250
- Titan 130
- Mars 100
- Mars 90
- Taurus 70
- Taurus 60
- Centaur 50
- Centaur 40
- Saturn 20
- Mars 100 S
- Mars T14000

## WESTINGHOUSE

- 251
- 251 B
- 251 B12
- 252B
- 501 A
- 501 D
- 501 D5
- 501 D5A
- 501 DA
- 501 F
- 501 FD
- 501FD2
- 501FD3
- 501G
- 701D
- 701F
- W25
- Trent Enconopac



# CONNECTING YOU TO A BETTER WAY

EnergyLink International is a leading supplier of specialized and balanced solutions for air and noise emissions control, building design and construction, acoustic control engineering services, mitigation and gas turbine auxiliary systems. Backed by more than 25 years of ingenuity and a strong commitment to customer excellence we have an unwavering focus for developing leading-edge technologies, environmental advancements, superior construction and quality manufacturing through our team of dedicated professionals who ensure our customers are well positioned for both today and the future.



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