Process Design Practices

for design, optimisation and troubleshooting

Presenter: Cilliers Kruger

ACCREDITED Course IChemE

4 to 8 November 2019 in GAUTENG

(Discounts for registration before 31 August 2019)

OVERVIEW

- Intensive 5 day training course for chemical engineers with 1 to 5 years' experience. Bridges the gap between university education and practical process engineering.
- Emphasizes calculation methods and techniques to troubleshoot and design process units.
- Case studies utilising design practices in practical problem solving.
- Accredited as Continued Professional Development Activity by SAIChE for 5 ECSA registration credits (SAIChE-348).
- Accredited as an IChemE Approved course from 2015.

"This course is a must for all process support and process design engineers." *[Process Manager, Multinational Oil Company.]*

"Great course from somebody with real life experience in design and plant operations and troubleshooting. You are never too old to learn how stuff really works! *[Principal Process Engineer, 25 years' experience, International Petrochemical Company]*

*"**This course cuts through all the fuzz universities taught us to give a PRACTICAL overview of process engineering. I would recommend it to all young engineers as a starting point for their careers. IT IS LIFE CHANGING!"*** *[Process Engineer, 2 years' experience]*

CONTENT

- ✓ **Simulation.** Flash calculations; Equations of state; Mass, energy and entropy balances; Simulation of typical equipment; Phase equilibrium; Immiscible systems; Critical and retrograde phenomena.
- ✓ **Design Conditions.** Relief valve locations; Design pressure, including typical margins, pumps shut off head, 10/13 rule; Vacuum design pressure; Test pressure; Design temperature, including typical margins; MDMT; Minimum pressurization temperature; Flanges, including type, facing and rating; Pipe specs; Pipe spec breaks.
- ✓ **Hydraulics.** Pipe sizing techniques; Equipment nozzle sizing; Typical equipment pressure drops; Hydraulic cases; Hydraulic circuits.
- ✓ **Piping.** Pressure drop calculation; Incompressible flow; Compressible flow; Two-phase flow; Two-phase flow regime maps; Friction factors; Pipe roughness; Insulation and tracing; Hot taps and stopples; Hand valves.
- ✓ **Flow Orifices.** Types; Orifice construction, taps, straight run requirements and wiring diagram; Orifice sizing; Beta ratio limits; Orifice/nozzle equations; Choke flow; Two-phase flow; Discharge coefficients; Expansion factors; Permanent pressure drop; Flow correction.
- ✓ **Control Valves.** Components; Body types, size, trim, action, direction and characteristics; Actuator type and action; Positioners; Failure mode; Installation; Wiring diagram; Valve sizing; Equations for liquids, gases and two-phase flow.
- ✓ **Vessels.** Types; Sizing and rating techniques and equations; Level configurations; Vessel nozzles and heads; Vertical and horizontal vessel layout; Inlet piping; Elevation and supports; Volumes.
- ✓ **Towers.** Simulations, Tray types; Efficiency; Column sizing criteria; Jet and Downcomer flooding; Derating factor; Tray spacing; Tower layout; Tray and piping layout at feeds, draw offs, transitions and reboilers; Types and layout of reboilers/condensers.
- ✓ **Pumps & Compressors.** Typical pump/compressor components and types; Suction/discharge piping; Stuffing box pressure; Typical pump/compressor curves; Spillback options; NPSHA and NPSHR; Seal systems; Horsepower; Capacity/pressure control; Surge control; Drivers. **Since 2017 also added VACUUM EJECTORS.**
- ✓ **Exchangers.** Heat transfer basics; Typical U values; Temperature difference; F_T factor; Approach; Heat release curves; Pressure drop; TEMA types and guidelines; Tube and pass arrangements; Baffles; Typical layouts.
- ✓ **Heaters.** Heater types; Heater components; Radiant/Convection sections; Sootblowing; Decoking; Dryout and startup/shutdown; Burners; Fuel piping and shutdown systems; Simulation practices; Efficiency; Excess air/oxygen; Flue gas dew point and ash corrosion; Process inlet piping.
- ✓ **Relief Valves.** Set, accumulated and back pressures; Relief valve types; ASME 1 & 8 issues; Relief valve sizing; Inlet and outlet piping; Relief cases and loads; Instrumentations and double jeopardy.
- ✓ **Metallurgy.** Design life; Common refinery materials and ASTM Designations; Refining corrosion mechanisms, including high temperature hydrogen, sulphur and hydrogen sulphide corrosion; HIC; PWHT; CUI; Temper embrittlement; Flue ash corrosion; PTSCC and CSCC; Non-destructive testing.

PRESENTER

Cilliers Kruger is a chemical engineer with 20 year's international experience in process plant simulation, design and operation. His experience covers the entire design process, from conceptual design to commissioning and operation. He has prepared design specifications for numerous plants and has a comprehensive knowledge of typical design practices.

His course emphasizes the methods actually used by design companies, and includes high quality handouts.

VENUE (Gauteng)

Kopanong Hotel and Conference Centre
243 Glen Gory Road
Benoni
1509

web: http://aha.co.za/kopanong/
Tel: 011 749 0000

FEE: (Excluding VAT)

Cost per attendee is dependent on number of participants: R 25 000 per person (excl VAT) if there are at least 20 registrations by 31 August 2019; R 30 000 if there are less than 20 registrations by 31 August 2019. This excludes travel and accommodation cost for attendees.

A 5% discount is offered to all registrations before 31 August 2019. Additional 5% discount offered to companies with more than 10 attendees, and 10% discount for more than 20 attendees based on registration by 31 August 2019.

A late booking fee of R 2 500.00 per attendee will apply to registrations received after 31 August 2019.

Payment: On 1 September 2019 or thereafter upon registration an invoice would be sent to the nominated contact for payment by electronic transfer within 30 days. Late payment could result in put attendance reservation of attendance at jeopardy.

REGISTRATION *(BEFORE 31 August 2019)*

The registration form is available on the 'Scheduled Events' page of the *RESOLVE* web site www.resolvekzn.co.za. The completed form can either be e-mailed to andries@resolvekzn.co.za or faxed to 0865 477 846.

Positions are limited and will be filled on a first-come-first served basis.

RESERVATIONS:

Full payment is the final guarantee of reservation; late payment could put reservation at risk if more than maximum course limit is exceeded.

Cancellation after 31 August 2019 would still be liable for full payment. If you registered and are unable to attend the event you may substitute at any time. Such substitution and name changes must be communicated to *RESOLVE* by e-mail.

Presentation of the course is subject to a minimum of 15 attendees registered before 31 August 2019.
The programme could be subject to change at the discretion of Cilliers Kruger or *RESOLVE* and in the event of illness the date or presenter could be altered.

HOST

This excellent opportunity for development of Process Engineers is proudly enabled and hosted by UNLOCK AND ALIGN FACILITATION CC. trading as *RESOLVE.* Andries Burger (Pr. Chem. Engr. 930289) has 30 years' experience in the petrochemical industry including process optimisation; concept development; production optimisation and scheduling; operation; maintenance and project management; personnel development, change management; coaching and mentoring. He focuses on technical process training coordination; management and leadership training facilitation; business process review and optimisation and personal coaching and mentoring.

Refer to www.resolvekzn.co.za for more information on this or other exciting opportunities hosted and presented by *RESOLVE*

RESOLVE
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REGISTRATION *(Note late booking supplement after 31 August 2019)*

2019 PROCESS DESIGN PRACTICES COURSE *for design, optimisation and troubleshooting*

4 to 8 November 2019 at the Kopanong Hotel and Conference Centre, Benoni, GAUTENG

Download and complete registration form and e-mail to andries@resolvekzn.co.za

Find herewith a request for the following reservation for the above training course:

REGISTRAR DETAIL:

Name: _____ e-mail: _____ Tel: _____

INVOICE DETAIL:

Company Name: _____ VAT Nr. _____ Quotation Required? (Yes / No): _____

Company Invoice Address: _____ Order Nr. _____

Invoice Contact Name: _____ Invoice Contact e-mail: _____ Invoice Contact Tel: _____

ATTENDEE DETAILS:

	Name	Surname	ID Nr	e-mail	ECSA Nr	Dietary Limitations
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Course Fee:.

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