Z-GROUP | 3 Business Units
Until end 2011

81 million $ Revenue
812 Employees

- Total operational shutdown safety management
- Coordination and supply of trained & certified safety experts
- Safety equipment rental, maintenance and distribution of (turnaround) safety equipment
- Materials management and maintenance technical work equipment
- Vendor contract management (brand independent procurement & replenishment of safety & technical work equipment)

- Z-Monitoring: technology based solution for confined space entry:
  - Mobile & wireless data link to central control room
  - Continuous gas-detection
  - Camera surveillance
  - Access control
  - Bidirectional communication
  - Alarm functionalities
- Z-Spider: area gas detection solution
- Z-Tracker: track & tracing solution
- Z-Matic: automatic dispense technology of safety/tools merchandise

- Temporary staffing service provider
- Strong focus on project related staffing
- Active in safety, security, cleaning, energy, logistics, automotive & food
- Supplier of all temporary project-related resources for Z-Safety Services
Z-Safety Services
West-European presence

5 countries | 16 offices

- Belgium
  - Limburg
  - Antwerp
  - Z-Project Staffing (6)
- The Netherlands
  - Rotterdam
- Germany
  - Gelsenkirchen
  - Köln
  - Leuna
- France
  - Martigues
  - Le Havre
- UK
  - Leeds
  - Aberdeen

On project basis also active in Spain
Total Safety & Z-Group in 2012
Global Integrated Safety Service providers

Merger 19/12/2011

SAFETY MANAGEMENT

TECHNOLOGY SYSTEMS

INTERIM STAFFING

Confidential – the content of this presentation is intellectual property of Z-Systems
CokingCom 2012 | Bart Peetermans
Including Z-Safety Services, Total Safety has 134 facilities in 18 countries.

- Industry-leading reach provides significant competitive advantage
- 134 facilities in 18 countries, including 69 IPSCs co-located at client facilities
- Operating presence in 14 additional countries
Safety supervision in confined spaces: …a challenge?

- TA & project trends in Europe
- Solutions in technology
- Added value in safety output & cost effectiveness
Specialized Safety Personnel (SSP) Period 2008-2011

<table>
<thead>
<tr>
<th>Year</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>818,091</td>
<td>1,106,559</td>
<td>859,851</td>
<td>818,091</td>
</tr>
<tr>
<td>2009</td>
<td>818,091</td>
<td>1,106,559</td>
<td>859,851</td>
<td>818,091</td>
</tr>
<tr>
<td>2010</td>
<td>818,091</td>
<td>1,106,559</td>
<td>859,851</td>
<td>818,091</td>
</tr>
<tr>
<td>2011</td>
<td>818,091</td>
<td>1,106,559</td>
<td>859,851</td>
<td>818,091</td>
</tr>
</tbody>
</table>

SSP hours
Trends in Safety Supervision
Daily maintenance, TARs & projects

- ↑ workload & ↓ working time
- ↑ job requirements concerning safety
- ↓ job appreciation & valuation
- Experience (13 years) & lessons learned

...TECHNOLOGY as support
Z-Monitoring
Technology as support

RIGHT “BALANCE” BETWEEN MAN & TECHNOLOGY
HIGHER SAFETY LEVEL - MORE CONTROL

Improved safety supervision through technology
Actual situation
Safety guards

1. PERMIT CHECK
2. ACCESS REGISTRATION
3. LOCAL GAS DETECTION
4. SAFETY OBSERVATION
5. COMMUNICATION WITH ENTRANTS
6. ALARMING*

* For Belgium: incl. first line intervention
Automatic access control
Continuous gas detection
Camera surveillance
Communication
Alarming
Wireless data transfer

Central Control Unit
## Standard configuration

### Safety equipment

<table>
<thead>
<tr>
<th>PER WORK SPOT</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>2x access control</td>
<td>1x outside conf. space</td>
</tr>
<tr>
<td></td>
<td>1x inside conf. space</td>
</tr>
<tr>
<td>4 + 1 gas detection</td>
<td>$O_2$, LEL, $H_2S$, CO</td>
</tr>
<tr>
<td></td>
<td>+ 1 optional (PID, …)</td>
</tr>
<tr>
<td>2x camera monitoring</td>
<td>1x outside manhole</td>
</tr>
<tr>
<td></td>
<td>1x on the work spot</td>
</tr>
<tr>
<td>2x antennas</td>
<td>Dependent on the location/plant</td>
</tr>
<tr>
<td>2x communication &amp; alarming</td>
<td>2 intercom boxes</td>
</tr>
<tr>
<td></td>
<td>2 alarms + flashlights</td>
</tr>
<tr>
<td>1x Central Control Unit</td>
<td>Configuration &amp; setting per 12 work spots</td>
</tr>
</tbody>
</table>

### Balance between man & technology
Technical features
Access control

- 1 badge reader INSIDE the conf. space
- 1 badge reader OUTSIDE the conf. space

- Personalized active RFID tokens
- Max reader/tag distance:
  - standard: 1m
  - long range: up to 5m (upon request)
- Data transmission between badge readers on different levels is ensured by RS485/ETH network
- Possibility to create different zones, access levels and user profiles up to 10,000 users
- Roll call and head count information within a mouse click in case of emergency
Automatic access control
Standard NO authorization
Automatic access control
Access rights per reactor

Authorization for Reactor 1205
Every IN event is visible to the operator.

**GREEN** = Authorized access

**RED** = Unauthorized access -> Operator intervention required

**RED** = Unauthorized access for R1204

**GREEN**: Access allowed for R1205
Automatic access control
Real time visualization of number of people

<table>
<thead>
<tr>
<th>Reactor numbers</th>
<th>Number of people per reactor</th>
<th>Total number of people per area</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1101</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>R1102</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>R1103</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>R1104</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>R1105</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>R1201</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>R1202</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>R1203</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>R1204</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>R1205</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td><strong>Totaal:</strong></td>
<td><strong>7</strong></td>
<td></td>
</tr>
</tbody>
</table>
### Overzicht aanwezigen: Alles

Datum aanmaak: 24/01/2012 18:36:59  
Totaal aantal aanwezigen: 12

<table>
<thead>
<tr>
<th>Naam</th>
<th>Subcontractor</th>
<th>Aantal</th>
<th>Area clock-in</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>R1101</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>COFELY</em> 190</td>
<td>Cofely</td>
<td>3</td>
<td>24/01/2012 18:35:34</td>
</tr>
<tr>
<td><em>COFELY</em> 205</td>
<td>Cofely</td>
<td></td>
<td>24/01/2012 18:32:50</td>
</tr>
<tr>
<td><em>COFELY</em> 206</td>
<td>Cofely</td>
<td></td>
<td>24/01/2012 18:36:35</td>
</tr>
<tr>
<td><strong>R1105</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>COFELY</em> 52</td>
<td>Cofely</td>
<td>3</td>
<td>24/01/2012 17:54:43</td>
</tr>
<tr>
<td><em>COFELY</em> 92</td>
<td>Cofely</td>
<td></td>
<td>24/01/2012 17:52:27</td>
</tr>
<tr>
<td><em>COFELY</em> 95</td>
<td>Cofely</td>
<td></td>
<td>24/01/2012 17:52:46</td>
</tr>
<tr>
<td><strong>R1201</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>325</td>
<td>(geen)</td>
<td>4</td>
<td>24/01/2012 18:34:48</td>
</tr>
<tr>
<td><em>COFELY</em> 137</td>
<td>Cofely</td>
<td></td>
<td>24/01/2012 18:35:54</td>
</tr>
<tr>
<td><em>COFELY</em> 49</td>
<td>Cofely</td>
<td></td>
<td>24/01/2012 18:32:44</td>
</tr>
<tr>
<td><em>COFELY</em> 77</td>
<td>Cofely</td>
<td></td>
<td>24/01/2012 18:34:01</td>
</tr>
</tbody>
</table>
Technical features
Gas detection

- **STANDARD** configuration: O₂ - LEL - H₂S – CO (up to 40 different gasses possible – upon request)
- **1 OPTIONAL** sensor possible: PID - dust - temperature - humidity
- Gas detection through a sampling system, minimizing the disturbance of sensors in the confined space

- Continuous flow control in the sampling system (2 l/min)
- Continuous monitoring of sensor condition through “heartbeat”
- Full event logging (calibration-bump test-gas out-breaks-temperature…)
- Sampled gas is conditioned and filtered (dust & watering filter)
- Stand-alone alarming (no operator action or communication with CCR needed to alarm)
- CE and UL approved (from 07/2012)
Gas detection
Permanent real time

Real time gas measurements
Gas detection trend
(measurement in reactor 1202 dd 3 January 2012 at 07.55)

O2 Depletion

Rising CO level during welding
1 camera INSIDE the manhole on the work spot

1 camera OUTSIDE the manhole to control the entrance and the environment of the access to the manhole

- Dual lens HiRes cameras (up to 3 MP)
- Day & night vision by IR blacklight
- Full event and data logging in camera
- PoE (Power over Ethernet) – no extra power cables needed
- Storage interval fully configurable to customer wish
Technical features
CCTV

The operator can take screenshots when dangerous situations occur.

Registration when motion detected. Images can be reviewed.
Technical features

Antennas

- Wireless data transmission PTO (point-to-point) or PTMP (point-to-multi-point)
- Fully secured and 128 bit encrypted data transmission
- In accordance with RFI standards & therefore immune for in plant data/control system
- Uses 5.4 ~ 5.8 GHz band (16 channels)
- Max distance:
  - line of sight: up to 10 km
  - no line of sight: site visit / plan

Required to determine the number of APs (Access Points)
Technical features
Communication & alarming

- Communication system integrated in the cameras: activation by push-to-talk button
- 2 intercom boxes: 1 INSIDE / 1 OUTSIDE the manhole
- 2 alarms with flashlights (visual & acoustic): 1 INSIDE / 1 OUTSIDE the manhole

- Full duplex communication
- Activation locally & automatically by the gas detection system or remotely by the operator
- First alarm level = flash light
  Second alarm level = siren
The operator can communicate with the people in and around the confined space through the integrated intercom.

Push to talk button to open the communication link.
Technical features

Alarming

1. Manual activation of the alarms by operator in CCR

2. Automatic activation of the alarm by the gas detection system
Technical features

Alarming

1. Evacuate The Area
2. Contact Fire Brigade
3. Contact Safety Supervisor
4. Print Access Control
5. DoubleCheck Evacuation
6. Complete Logfile
Technical features

Alarming

1. Evacuate The Area
2. Contact Fire Brigade
3. Contact Safety Supervisor
4. Print Access Control
5. Doublecheck Evacuation
6. Complete Logfile
Technical features

Alarming

1. Evacuate The Area
2. Contact Fire Brigade
3. Contact Safety Supervisor
4. Print Access Control
5. Doublecheck Evacuation
6. Complete Logfile

Alarm procedure completed!
Technical features
Central Control Room (CCR)

- Visualization software platform to centralize, analyse and report all incoming data
- Continuous supervision of the work spots/confined spaces by trained professionals
- Tick boxes to check/indicate the work permits, required PPE and atmosphere
- Clear visualization of alarm conditions and status (green/orange/red + sound)
- Visual & acoustic pop-ups in case of incoming call
- Continuous check of network condition and status
- Logging of operator by check-in each change (alternately active in control room and in the field – rotation every 2 hours)
Technical features
Central Control Room (CCR)

Camera images reactors R1101 - R1105

Gas measurements in reactors 1101 - 1105

Access control

Camera images reactors R1201 - R1205

Gas measurements in reactors 1201 - 1205
Standard configuration
Safety supervision

<table>
<thead>
<tr>
<th>Number of work spots</th>
<th>INSIDE in the CCU</th>
<th>OUTSIDE in the field</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – 12</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>12-24</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>24-36</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>36-48</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>48-60</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

“RIGHT” BALANCE BETWEEN MAN & TECHNOLOGY
Continuous gas detection

- Measurement directly on the work spot/in the confined space
- Reliable reporting & trending of all gas measurements

Automatic access control

- Complete & detailed data of all entrances of the confined spaces
- Support towards on-site rescue team
- Reliable registration of all entrances
Camera monitoring
- Faster response time
- Direct communication in case of emergency
- Support of the on-site rescue team with direct images from the confined spaces
- Reliable live-stream reporting

Communication & alarming
- Intercom, visual & acoustic alarm on the work spot

Central Control Unit (CCR)
- Central follow-up & control room
SYSTEMS MANAGEMENT
Small device, huge performance

- 3D localization: width, length and altitude via satellite
- ATEX certification
- (In)voluntary alarm
- Vigilance system on reliable data system (no sms)
- Sector monitoring via geo-fencing
- Monitoring of walkways
- Hands-free calling with automatic answering

Software as the heart of the system

- Self-developed software, supported by a GPS system visualizes in detail the customer’s floor plan or any other location
Z-Tracker
Areas of application

Your employee works here. But where?

Industrial protection
- Finds workers who have had accidents or are missing
- Ideal for people working alone

TAR management & control rooms
- Detects the presence of people, e.g. in high-risk areas

Fire brigades
- Automatically alarms & informs emergency response organizations, control centers and monitoring centers
- Enables rapid and precise head count checks
Transition slide Z-MATIC
Z-Matic
Manned vs. unmanned

ON-SITE SAFETY SHOP

MANNED SYSTEM

Reduce missing items and damages thanks to high traceability of means and registration of users

ON-SITE Z-MATIC

UNMANNED SYSTEM

Permanent availability of work equipment thanks to an automated, controlled distribution and return platform

Combination of manned & unmanned possible
- Modular unmanned automatic control system
- 24/7 issue & return registration on individual & item level
- Increased availability of goods
- Management of:
  - rental equipment,
  - customer equipment,
  - sales goods & consumables
  - tools
- Lower administration & purchase costs (one issuing point)
- Easy to install | Stand-alone or network (multi-location)
- Z-tailor made controlling software