Coking & CatCracking Conference
19 - 21 October Düsseldorf

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History
1999-2011

Phase 1: 1999-2003
BENELUX
- Focus on core Safety Management Services in TA’s & projects:
  - Safety Personnel
    - Fire & Safety Guards to Project Coordinators
    - Gas analysts
    - Safety Supervisors
    - Planning
  - Safety Equipment
    - Rental
    - Shop
    - On-site logistics
    - Maintenance

Phase 2: 2004-2006
WEST-EUROPE
- Launch of new complementary activities initially as in-house suppliers:
  - Logistics
    - Materials Management
    - Warehouse & transport
    - Maintenance
    - Vendor Management
  - Monitoring
    - Confined space monitoring
    - Gas detection
  - Staffing
    - Temporary staffing services

Phase 3: 2007-2009
WEST-EUROPE
- Project-based expansion into new geographies UK, Spain
- Development new technology activities:
  - Z-Tracker
  - Z-Matic
  - ...
Z-Group
3 Business Units

ONE TOTAL SAFETY SERVICE PROVIDER

SAFETY SERVICES
MEMBER OF THE Z-GROUP

TECHNOLOGY SYSTEMS
MEMBER OF THE Z-GROUP

INTERIM STAFFING
MEMBER OF THE Z-GROUP

Coking & CatCracking Conference Düsseldorf October 2011 - Matty Zadnikar, Z-Group, CEO & Owner
Figures

Turnover | Personnel

Z-Group revenue | M€ | consolidated

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue</th>
<th>Personnel</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>0.5</td>
<td>31</td>
</tr>
<tr>
<td>2000</td>
<td>10.3</td>
<td>181</td>
</tr>
<tr>
<td>2001</td>
<td>17.2</td>
<td>247</td>
</tr>
<tr>
<td>2002</td>
<td>21.4</td>
<td>303</td>
</tr>
<tr>
<td>2003</td>
<td>33.7</td>
<td>385</td>
</tr>
<tr>
<td>2004</td>
<td>48.4</td>
<td>563</td>
</tr>
<tr>
<td>2005</td>
<td>56.8</td>
<td>680</td>
</tr>
<tr>
<td>2006</td>
<td>49.4</td>
<td>620</td>
</tr>
<tr>
<td>2007</td>
<td>56.4</td>
<td>660</td>
</tr>
<tr>
<td>2008</td>
<td></td>
<td>730</td>
</tr>
<tr>
<td>2009</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>65.0</td>
<td></td>
</tr>
</tbody>
</table>

Z-Employees

- 1999: 31
- 2000: 181
- 2001: 247
- 2002: 303
- 2003: 385
- 2004: 563
- 2005: 680
- 2006: 620
- 2007: 660
- 2008: 730

YoY growth %

- 1999: 68%
- 2000: 24%
- 2001: 57%
- 2002: 43%
- 2003: 17%
- 2004: -13%
- 2005: 13%
- 2006: 15%

Phases:

- Phase 1 1999-2003
- Phase 2 2004-2006
- Phase 3 2007-2009
- Phase 4 2010-2013
West-European presence

4 countries | 12 offices

- **Belgium**
  - Dilsen-Stokkem (HQ)
  - Antwerp
  - Z-Project Staffing (5)

- **The Netherlands**
  - Rotterdam

- **Germany**
  - Gelsenkirchen
  - Leuna

- **France**
  - Martigues
  - Le Havre
West-European references

Z-Safety Services | Z-Safety Systems
Safety supervision in confined spaces: …a challenge?

- TA & project trends
- New solutions in technology
- Added value in safety output & cost effectiveness
Trends in safety supervision
In daily maintenance, turnarounds & projects

↑ workload & ↓ working time

1.106.559 hrs. 859.851 hrs. 818.091 hrs.
Trends in safety supervision
In daily maintenance, turnarounds & projects

• ↑ workload & ↓ working time
• ↑ job requirements concerning safety
• ↓ job appreciation & valuation
• Experience (>11 years) & lessons learned

...TECHNOLOGY as support
Z-Monitoring
Man versus technology

SAFETY GUARDS

SUPERVISION + TECHNOLOGY

OLD SITUATION

NEW SITUATION

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*
Z-Monitoring
Man versus technology

Automatic access control
Continuous gas detection
Camera surveillance
Communication
Alarming
Wireless data transfer

Central Control Unit

MOVIE
# 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 manhole</td>
</tr>
<tr>
<td></td>
<td>1x inside manhole</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 manhole
- 1 badge reader OUTSIDE the manhole

- 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
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
Technical features
Camera monitoring

- 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

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
Technical features
Central Control Unit

- 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)
Standard configuration

Safety supervision

<table>
<thead>
<tr>
<th>Number of work spots</th>
<th>Monitoring Operators INSIDE in the CCU</th>
<th>Monitoring Operators 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>
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<tr>
<td>24-36</td>
<td>3</td>
<td>3</td>
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<tr>
<td>36-48</td>
<td>4</td>
<td>4</td>
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<tr>
<td>48-60</td>
<td>5</td>
<td>5</td>
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</tbody>
</table>

“RIGHT” BALANCE BETWEEN MAN & TECHNOLOGY
Z-Monitoring
Added value

↑ SAFETY ↑ EFFICIENCY

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
Z-Monitoring

Added value

↑ SAFETY ↑ EFFICIENCY

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