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Z-SYSTEMS | CokingCom Canada 2012



SYSTEMS

MEMBER OF THE Z-GROUP

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**



+



+



Z-SAFETY SERVICES

Global references



ExxonMobil



INEOS

ConocoPhillips



Suez



e-on



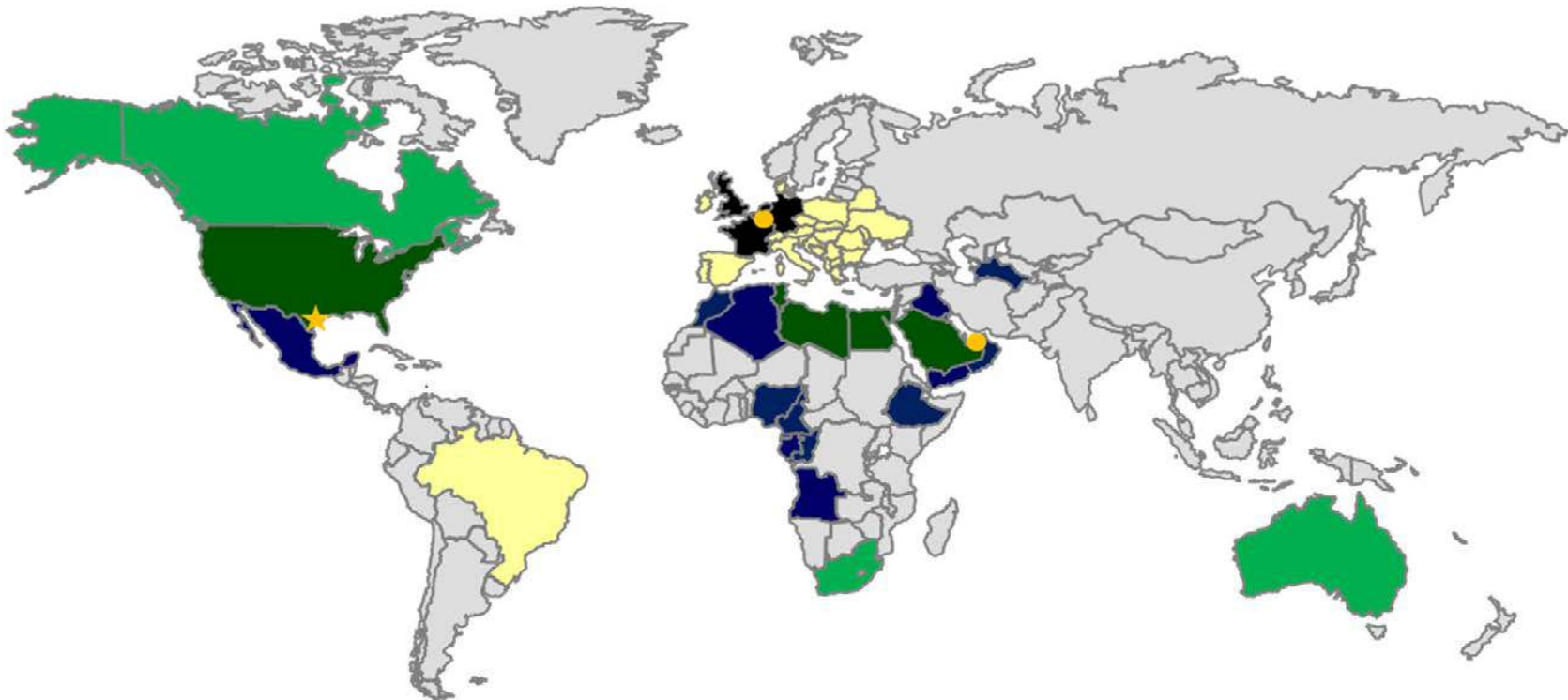
TOTAL SAFETY

Global presence



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

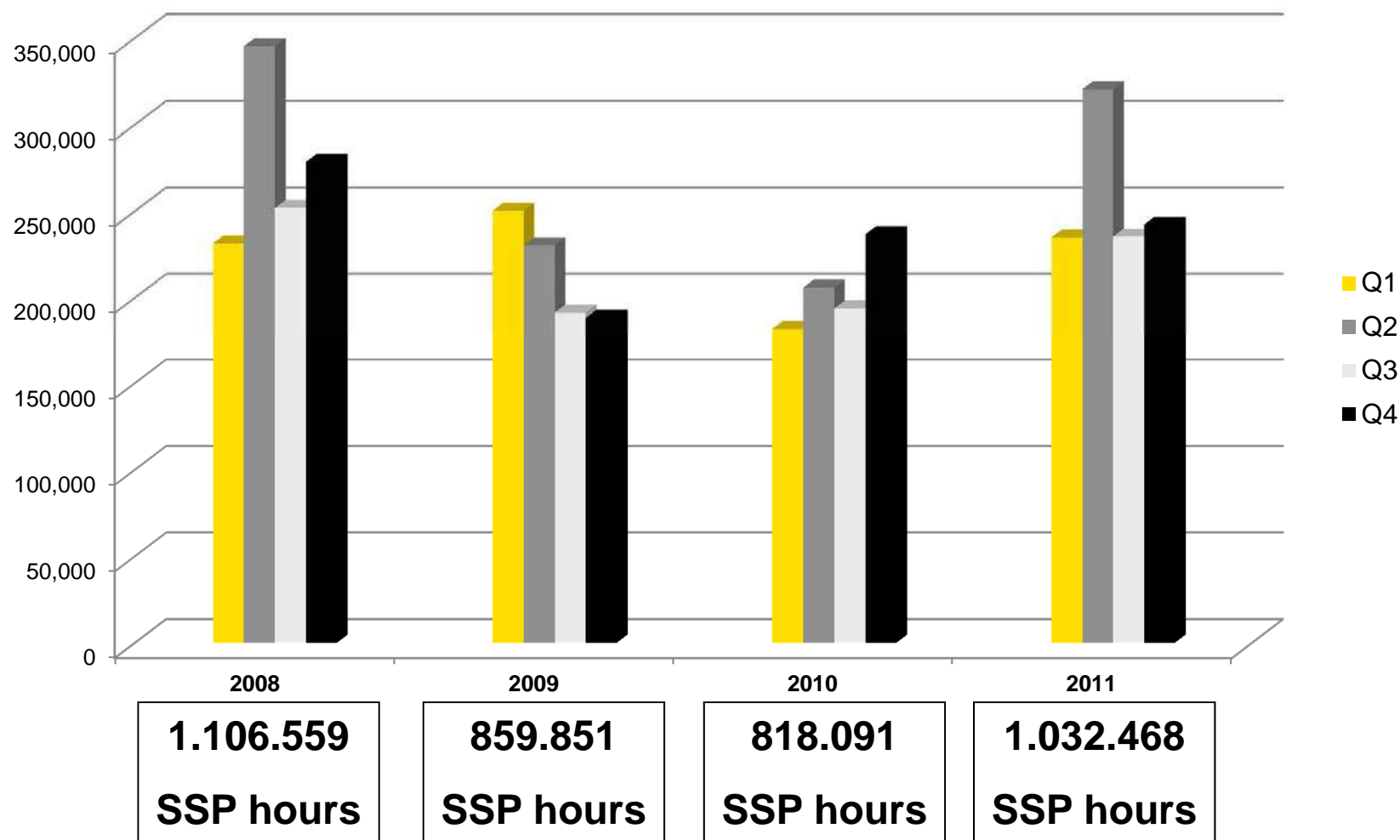


CokingCom Canada 2012

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

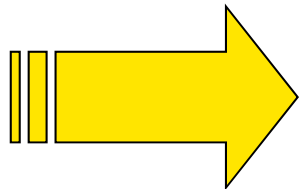


Trends in Safety Supervision

Daily maintenance, TARs & projects



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



...TECHNOLOGY as support

Z-MONITORING





Z-Monitoring Technology as support



SAFETY GUARDS

**OLD
SITUATION**



MONITORING SUPPORT

**NEW
SITUATION**



**RIGHT "BALANCE" BETWEEN MAN & TECHNOLOGY
HIGHER SAFETY LEVEL - MORE CONTROL**

Improved safety supervision through technology



Actual situation

Safety guards



MONITORING



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

COMMUNICATION
BEHAVIOUR
ATTENTION FOCUS
VISIBILITY
CULTURE LANGUAGE
STRESS RESPONSE TIME
DANGER ROUTINE

DANGER ROUTINE
STRESS RESPONSE TIME

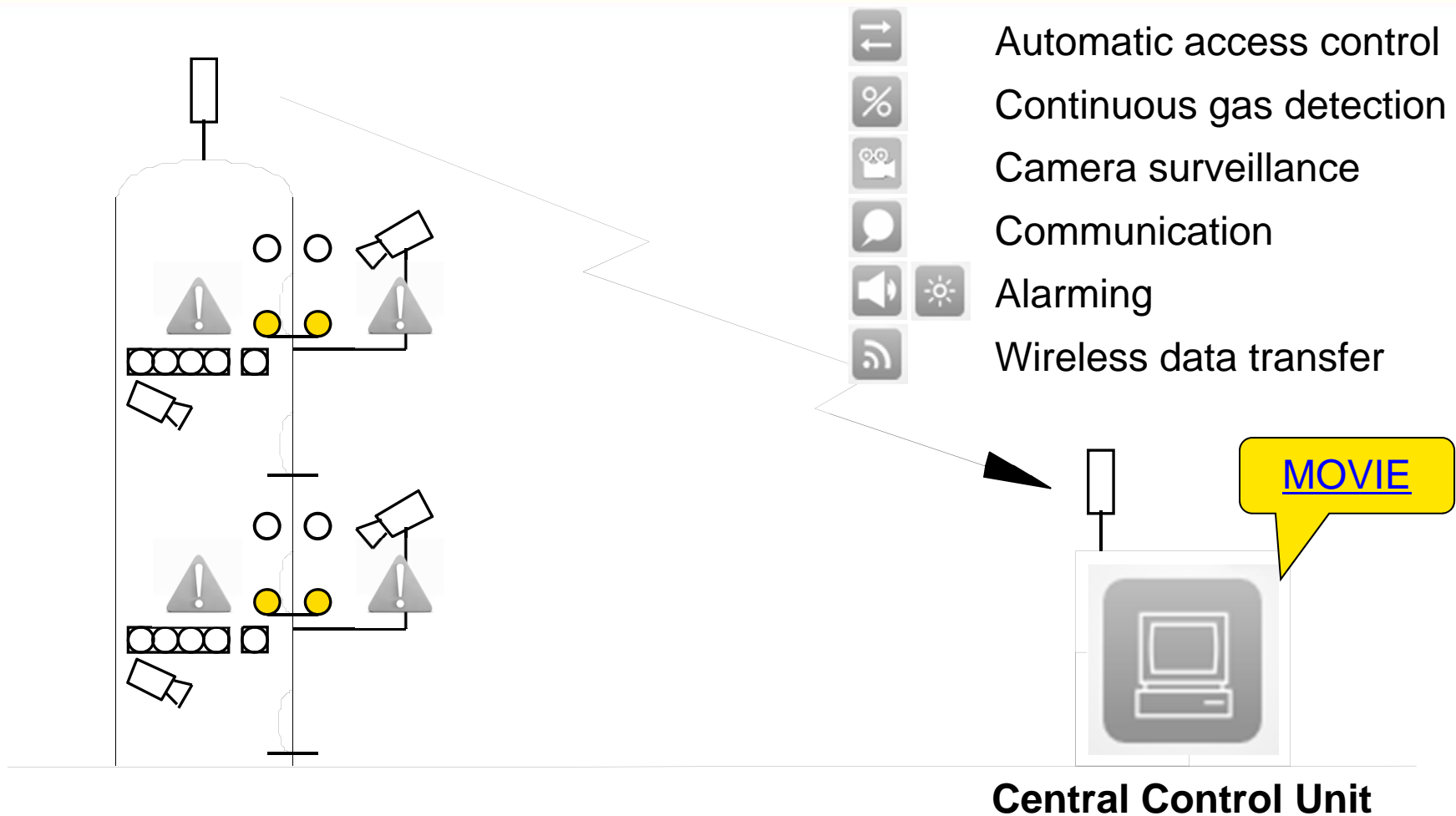


*** For Belgium: incl. first line intervention**



Z-Monitoring

Man versus technology





Standard configuration Safety equipment



PER WORK SPOT	Standard
2x access control	1x outside conf. space 1x inside conf. space
4 + 1 gas detection	O ₂ , LEL, H ₂ S, CO + 1 optional (PID, ...)
2x camera monitoring	1x outside manhole 1x on the work spot
2x antennas	Dependent on the location/plant
2x communication & alarming	2 intercom boxes 2 alarms + flashlights
1x Central Control Unit	Configuration & setting per 12 work spots



BALANCE BETWEEN MAN & TECHNOLOGY

Technical features

Access control

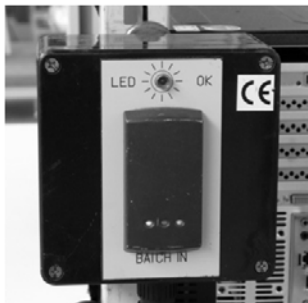


MONITORING

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



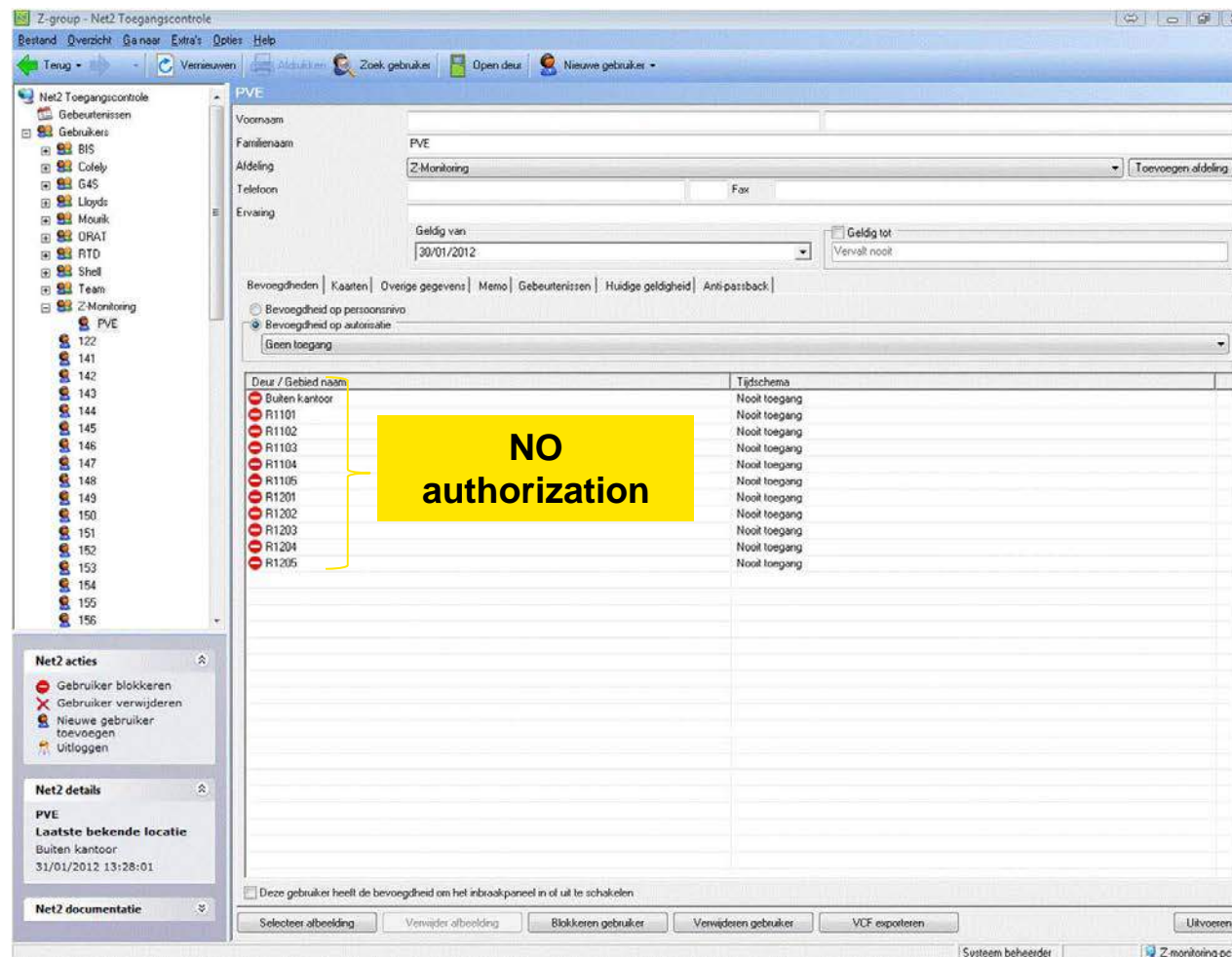
- Personalized active RFID tokens
- Max reader/tag distance:
 - *standard: 1m*
 - *long range: up to 5m (upon request)*
- Data transmission between badge readers on different levels is ensured by RS485/ETH network
- Possibility to create different zones, access levels and user profiles up to 10.000 users
- Roll call and head count information within a mouse click in case of emergency



Automatic access control Standard NO authorization



MONITORING



Automatic access control

Access rights per reactor



MONITORING

Z-group - Net2 Toegangscontrole

Bestand Overzicht Ga naar Extra's Opties Help

Terug Vernieuwen Alsdrukken Zoek gebruiker Open deur Nieuwe gebruiker

Net2 Toegangscontrole

- Gebeurtenissen
- Gebruikers
 - BIS
 - Cofely
 - G4S
 - Lloyds
 - Mouk
 - ORAT
 - RTD
 - Shell
 - Team
 - Z-Monitoring
 - 122
 - 141
 - 142
 - 143
 - 144
 - 145
 - 146
 - 147
 - 148
 - 149
 - 150
 - 151
 - 152
 - 153
 - 154
 - 155
 - 156

PVE

Voornaam: PVE

Familienaam: PVE

Afdeling: Z-Monitoring [Toevoegen afdeling]

Telefoon: Fax:

Ervaring:

Geldig van: 30/01/2012 Geldig tot: Vervalt nooit

Bevoegdheden Kaarten Overige gegevens Memo Gebeurtenissen Huidige geldigheid Anti-passback

☐ Bevoegdheid op persoonsniveau

☒ Bevoegdheid op autoisatie

R1205

Deur / Gebied naam	Tijdschema
Buiten kantoor	24 uur / 7 dagen
R1101	Nooit toegang
R1102	Nooit toegang
R1103	Nooit toegang
R1104	Nooit toegang
R1105	Nooit toegang
R1201	Nooit toegang
R1202	Nooit toegang
R1203	Nooit toegang
R1204	Nooit toegang
R1205	24 uur / 7 dagen

Net2 acties

- Gebruiker blokkeren
- Gebruiker verwijderen
- Nieuwe gebruiker toevoegen
- Uitloggen

Net2 details

PVE

Laatste bekende locatie

Buiten kantoor

31/01/2012 13:28:01

Net2 documentatie

Deze gebruiker heeft de bevoegdheid om het inbraakpaneel in of uit te schakelen

Selecteer afbeelding Verwijder afbeelding Blokkeren gebruiker Verwijderen gebruiker VCF exporteren Uitvoeren

System beheerder Z-monitoring pc

Authorization for
Reactor 1205



Automatic access control

Access rights per person



MONITORING

Every IN event is visible to the operator.

GREEN = Authorized acces

RED = Unauthorized acces ->
Operator intervention required

RED = Unauthorized access for
R1204

GREEN: Access allowed for R
1205

Z-Group event monitor						
Event Time	Peripheral Name	First Na...	Surname	Department Name	Event Type Descrip	
31-01 12:53	R1101 Set 27* (In)	231	R.Rojer	Cofely	Toegang verlee	
31-01 12:53	R1101 Set 27* (In)	223	N.Santos	Cofely	Toegang verlee	
31-01 12:52	R1101 Set 27* (In)	250	A.Silva	Cofely	Toegang verlee	
31-01 12:52	R1101 Set 27* (In)	231	R.Rojer	Cofely	Toegang verlee	
31-01 12:51	R1101 Set 27* (In)	248	A.Pereira	Cofely	Toegang verlee	
31-01 12:51	R1104 Set 5* (In)	5	Harms	Mourik	Toegang verlee	
31-01 12:50	R1101 Set 27* (In)	231	R.Rojer	Cofely	Toegang verlee	
31-01 12:50	R1104 Set 5* (In)	5	Harms	Mourik	Toegang verlee	
31-01 12:48	R1104 Set 5* (In)	5	Harms	Mourik	Toegang verlee	
31-01 12:47	R1104 Set 5* (In)	5	Harms	Mourik	Toegang verlee	
31-01 12:47	R1104 Set 5* (In)	5	Harms	Mourik	Toegang verlee	
31-01 12:44	R1102 Set 9* (In)	66	F.Koch	Cofely	Toegang verlee	
31-01 12:39	R1102 Set 9* (In)	66	F.Koch	Cofely	Toegang verlee	
31-01 12:39	R1104 Set 5* (In)	58	A.Saltani	BIS	Toegang verlee	
31-01 12:39	R1101 Set 27* (In)	231	R.Rojer	Cofely	Toegang verlee	
31-01 12:38	R1101 Set 27* (In)	231	R.Rojer	Cofely	Toegang verlee	
31-01 12:36	R1102 Set 9* (In)	66	F.Koch	Cofely	Toegang verlee	
31-01 12:31	R1204 Set 2* (In)		PVE	Z-Monitoring	Toegang gewe	
31-01 12:31	R1205 Set 3* (In)		PVE	Z-Monitoring	Toegang verlee	
31-01 12:30	R1105 Set 8* (In)	88	M.Ruth	Cofely	Toegang verlee	
31-01 12:30	R1105 Set 8* (In)		PVE	Z-Monitoring	Toegang gewe	
31-01 12:30	R1104 Set 5* (In)	63	H.Koch	Cofely	Toegang verlee	
31-01 12:30	R1101 Set 27* (In)	231	R.Rojer	Cofely	Toegang verlee	
31-01 12:30	R1104 Set 5* (In)		PVE	Z-Monitoring	Toegang gewe	
31-01 12:29	R1205 Set 3* (In)		PVE	Z-Monitoring	Toegang verlee	
31-01 12:27	R1202 Set 10* (In)	45	G.Wollhem	Cofely	Toegang verlee	
31-01 12:26	R1202 Set 10* (In)	91	R.Aust	Cofely	Toegang verlee	
31-01 12:24	R1101 Set 27* (In)	138	Freita Semcto	Cofely	Toegang verlee	
31-01 12:20	R1101 Set 27* (In)	138	Freita Semcto	Cofely	Toegang verlee	
31-01 12:17	R1101 Set 27* (In)	138	Freita Semcto	Cofelv	Toegana verlee	



Automatic access control

Real time visualization of number of people



MONITORING

Z-Group monitor

Laatste update: 14:17:41

Per Pagina:

R1101	1		<input type="checkbox"/>
R1102	0		<input type="checkbox"/>
R1103	2		<input type="checkbox"/>
R1104	0		<input type="checkbox"/>
R1105	0		<input type="checkbox"/>
R1201	0		<input type="checkbox"/>
R1202	0		<input type="checkbox"/>
R1203	2		<input type="checkbox"/>
R1204	2		<input type="checkbox"/>
R1205	0		<input type="checkbox"/>
	0		<input type="checkbox"/>
Totaal:	7		<input type="checkbox"/>

Reactor numbers

Number of people per reactor

Total number of people per area

Overzicht aanwezigen: Alles

Datum aanmaak: 24/01/2012 18:36:59

Totaal aantal aanwezigen: 12

Page 1 of 1



R1101

Aantal: 3

Naam:

Subcontractor:

Area clock-in:

COFELY 190

Cofely

24/01/2012 18:35:34

COFELY 205

Cofely

24/01/2012 18:32:50

COFELY 206

Cofely

24/01/2012 18:36:35

R1105

Aantal: 3

Naam:

Subcontractor:

Area clock-in:

COFELY 52

Cofely

24/01/2012 17:54:43

COFELY 92

Cofely

24/01/2012 17:52:27

COFELY 95

Cofely

24/01/2012 17:52:46

R1201

Aantal: 4

Naam:

Subcontractor:

Area clock-in:

325

(geen)

24/01/2012 18:34:48

COFELY 137

Cofely

24/01/2012 18:35:54

COFELY 49

Cofely

24/01/2012 18:32:44

COFELY 77

Cofely

24/01/2012 18:34:01

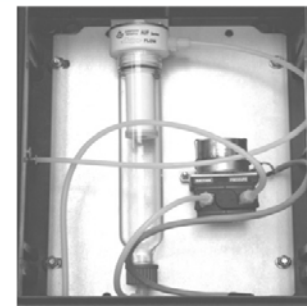


Technical features

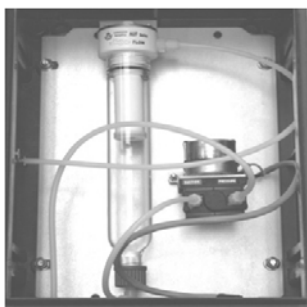
Gas detection



- **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



MONITORING

Siren ☐ OFF T101 M6 Set26

Outside

Take Screenshot

Z-Monitoring Sat Mar 17 11:58:54 2012

Inside

Take Screenshot

Z-Monitoring Sat Mar 17 11:58:59 2012

external recorder

O ₂	CO	H ₂ S	CH ₄
20.90	0.00	0.00	0.00

Menu Logged on as: Admin

Siren ☐ OFF T402 M1 Set23

Outside

Take Screenshot

Z-Monitoring Sat Mar 17 11:51:17 2012

Inside

Take Screenshot

Z-Monitoring Sat Mar 17 11:51:30 2012

external recorder

O ₂	CO	H ₂ S	CH ₄
20.90	0.00	0.00	0.00

raise alarm 1.3.1.11 TEST

Real time gas measurements



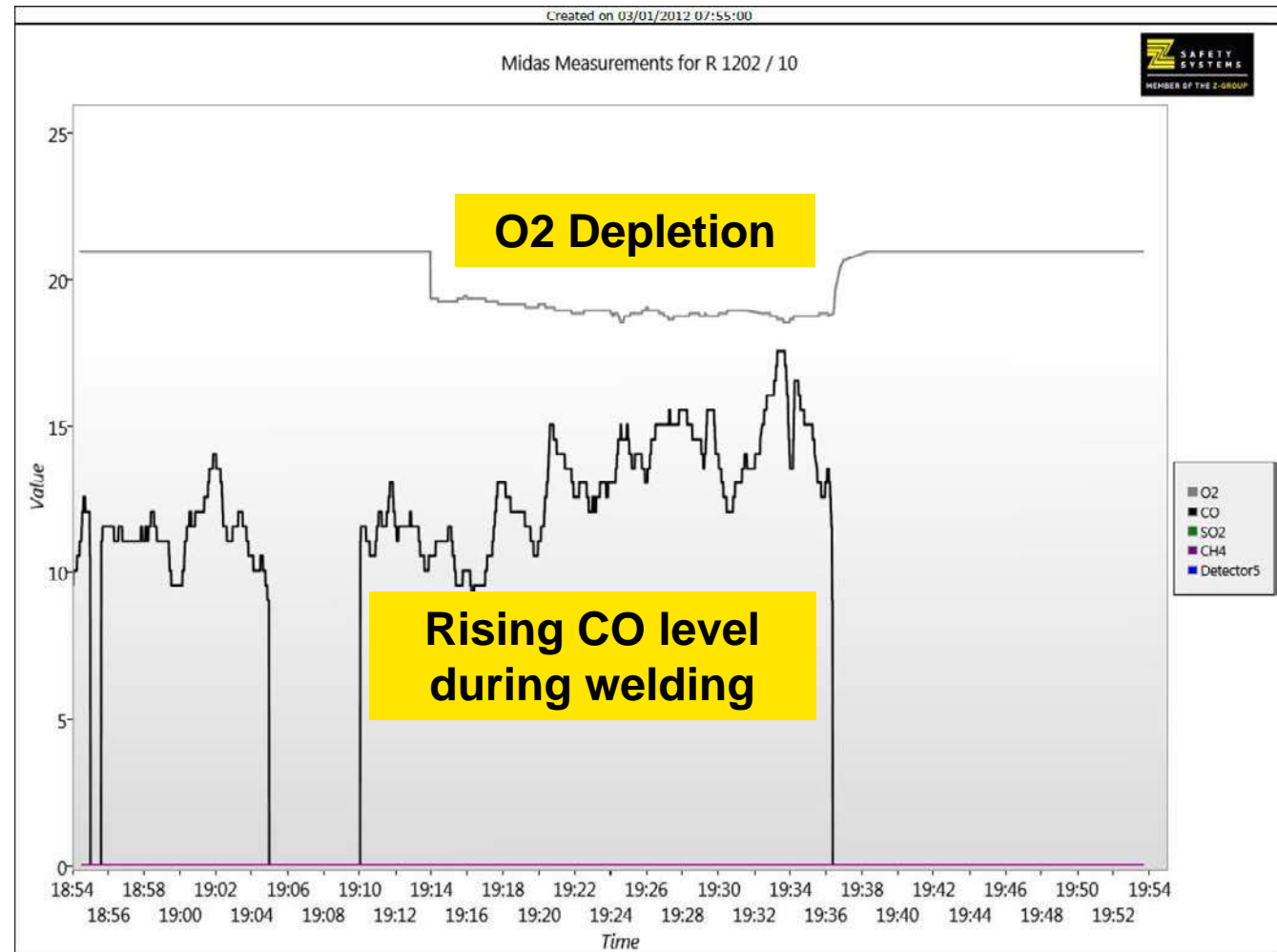
Gas detection

Permanent real time



MONITORING

**Gas detection
trend
(measurement in
reactor 1202 dd 3
January 2012 at
07.55)**





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 backlight
- 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



MONITORING

Registration when
motion detected.
Images can be
reviewed



The operator can
take screenshots
when dangerous
situations occur.



Siren ☐ OFF T001 M7 Set21

Z-Monitoring Tue Mar 20 14:38:47 2012

Outside

Take Screenshot

Inside

Take Screenshot

O2	CO	SO2	CH4	H2S (PPM)
20.90	0.00	0.00	0.00	0.00

Menu Logged on as: Admin

raise alarm 1.3.1.11 TEST



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





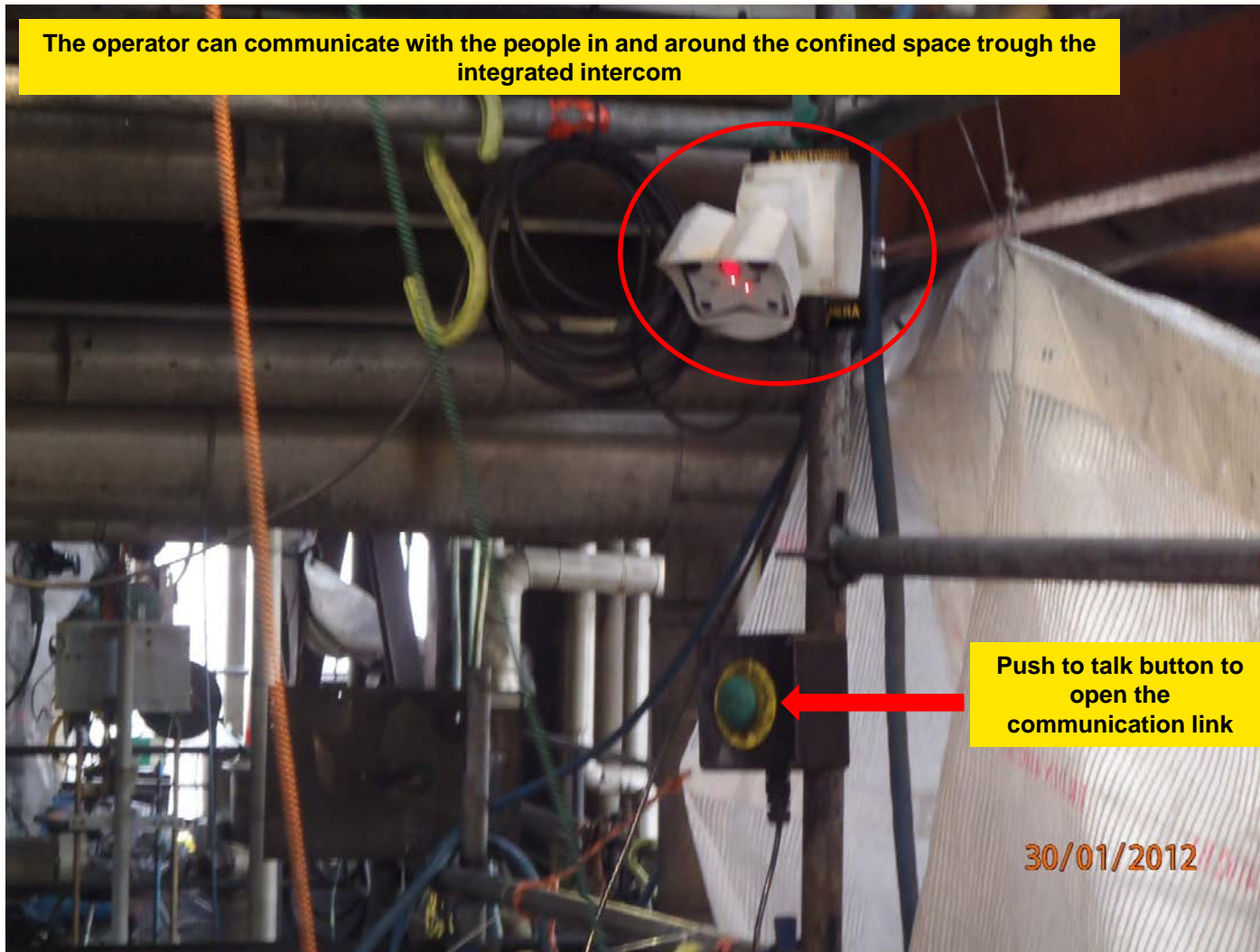
Technical features

Communication



MONITORING

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



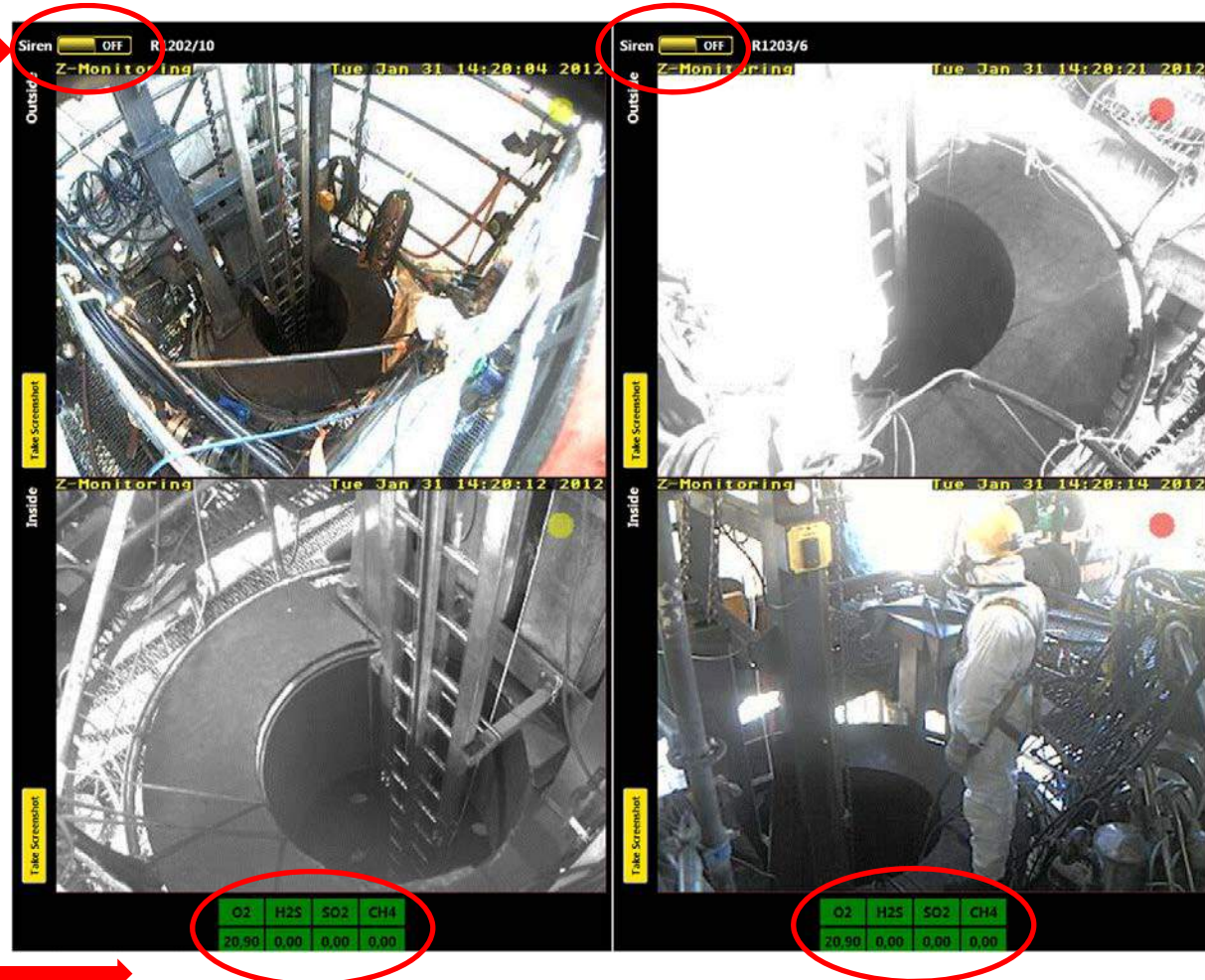
Technical features

Alarming



MONITORING

1. Manual activation of the alarms by operator in CCR



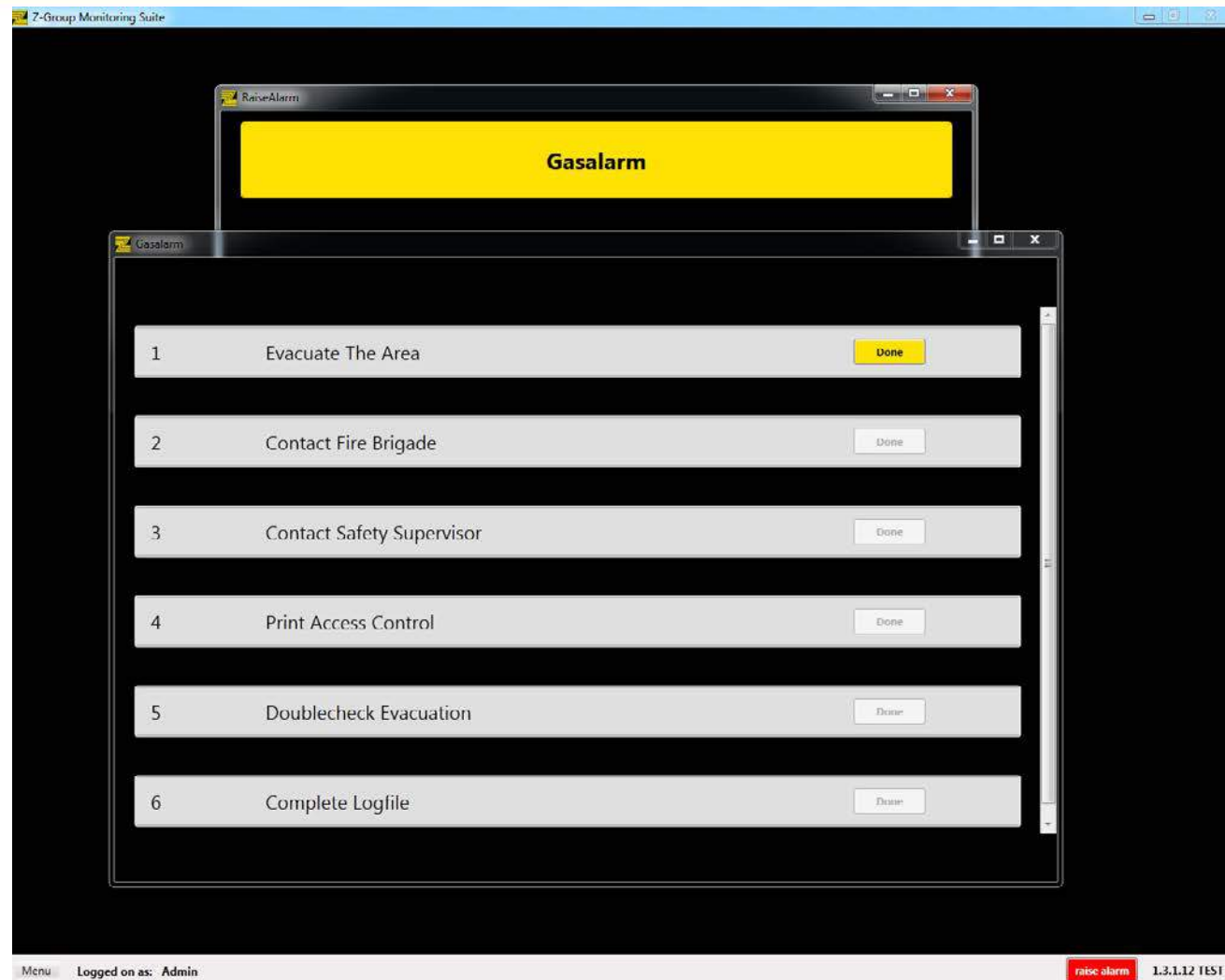
2. Automatic activation of the alarm by the gas detection system

Technical features

Alarming



MONITORING

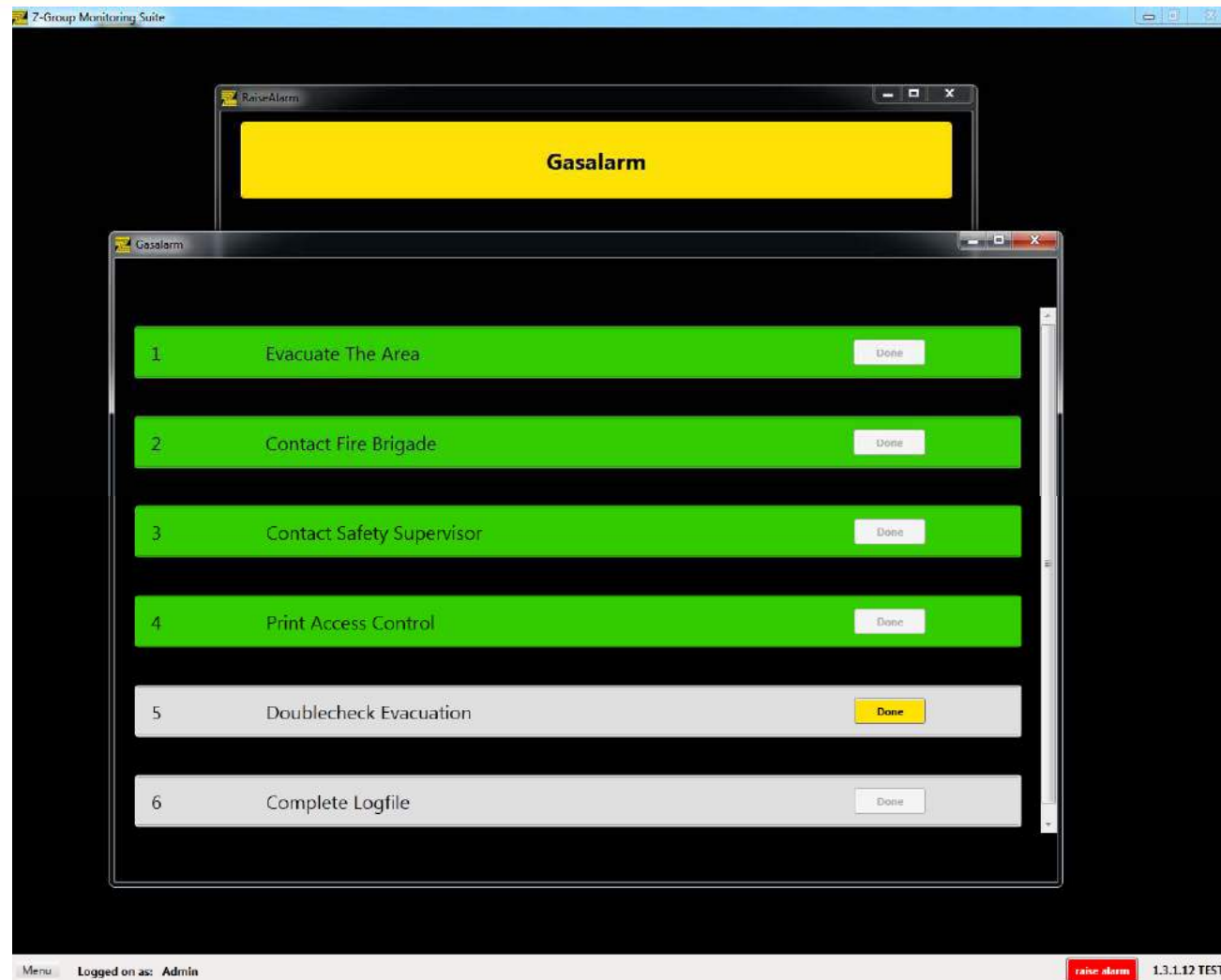


Technical features

Alarming



MONITORING

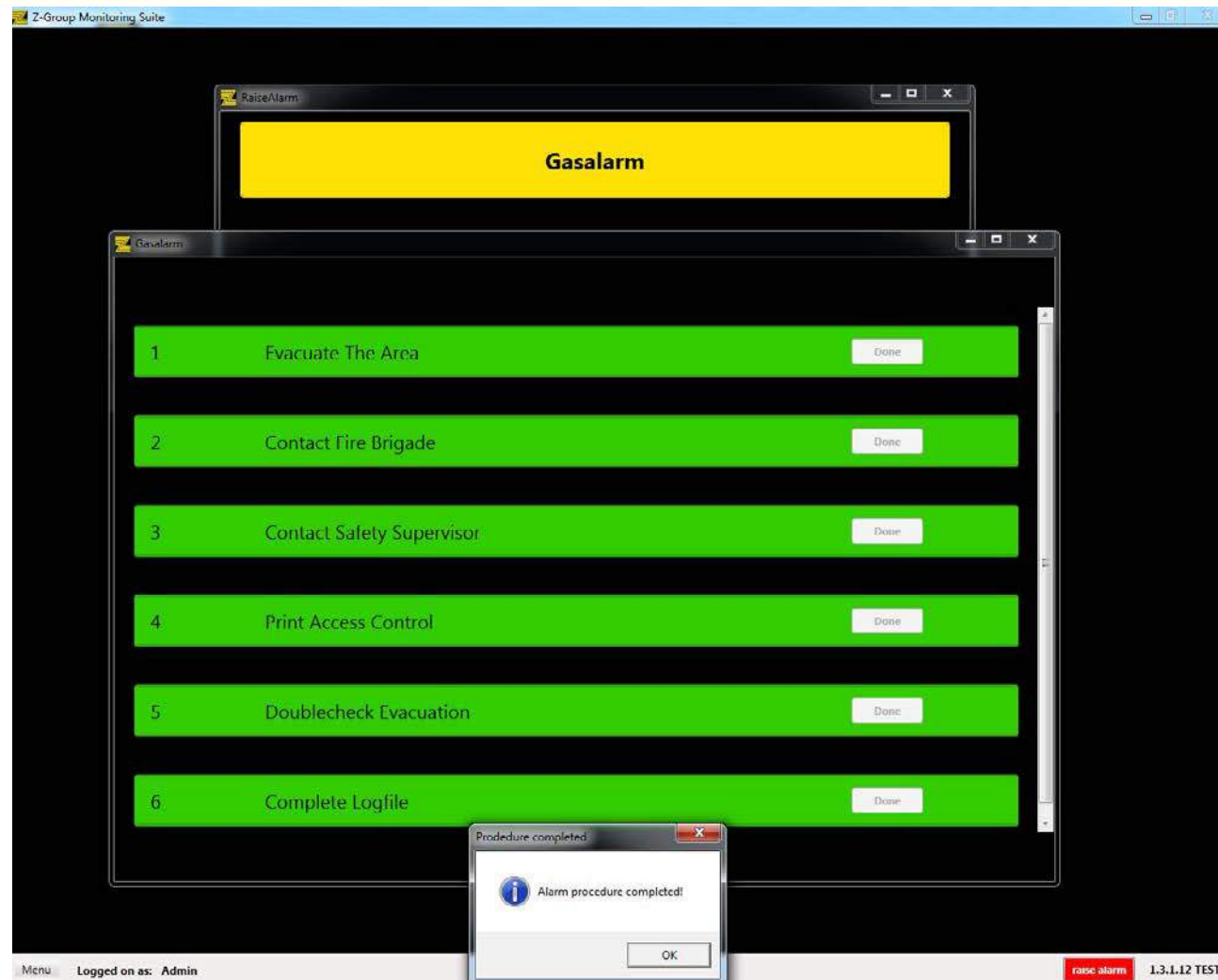


Technical features

Alarming



MONITORING



Technical features

Central Control Room (CCR)



MONITORING



- Visualization software platform to centralize, analyse and report all incoming data
- Continuous supervision of the work spots/ confined spaces by trained professionals



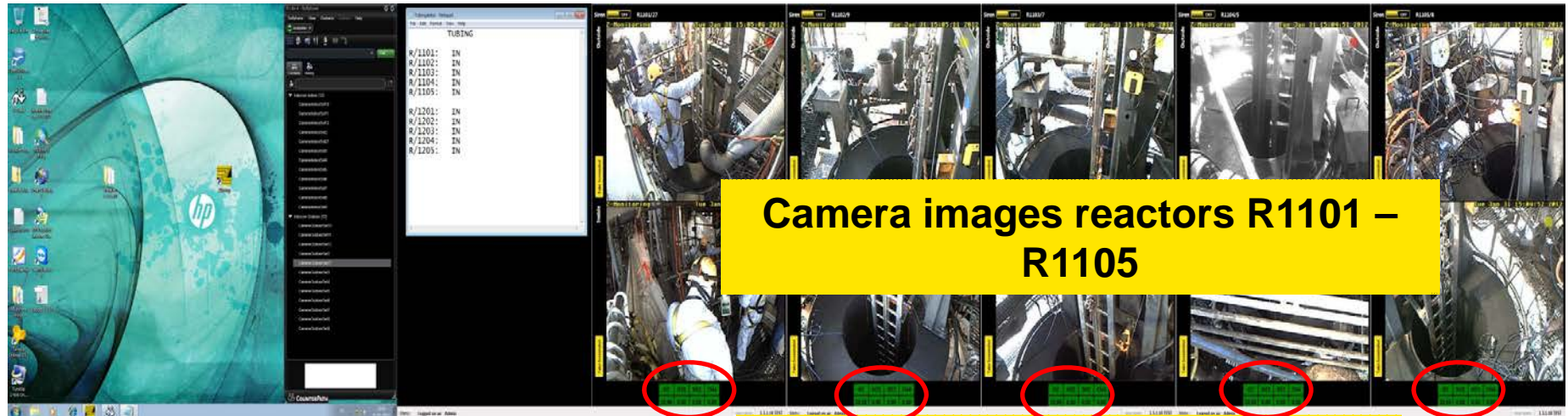
- Tick boxes to check/indicate the work permits, required PPE and atmosphere
- Clear visualization of alarm conditions and status (green/orange/red + sound)
- Visual & acoustic pop-ups in case of incoming call
- Continuous check of network condition and status
- Logging of operator by check-in each change (alternately active in control room and in the field – rotation every 2 hours)



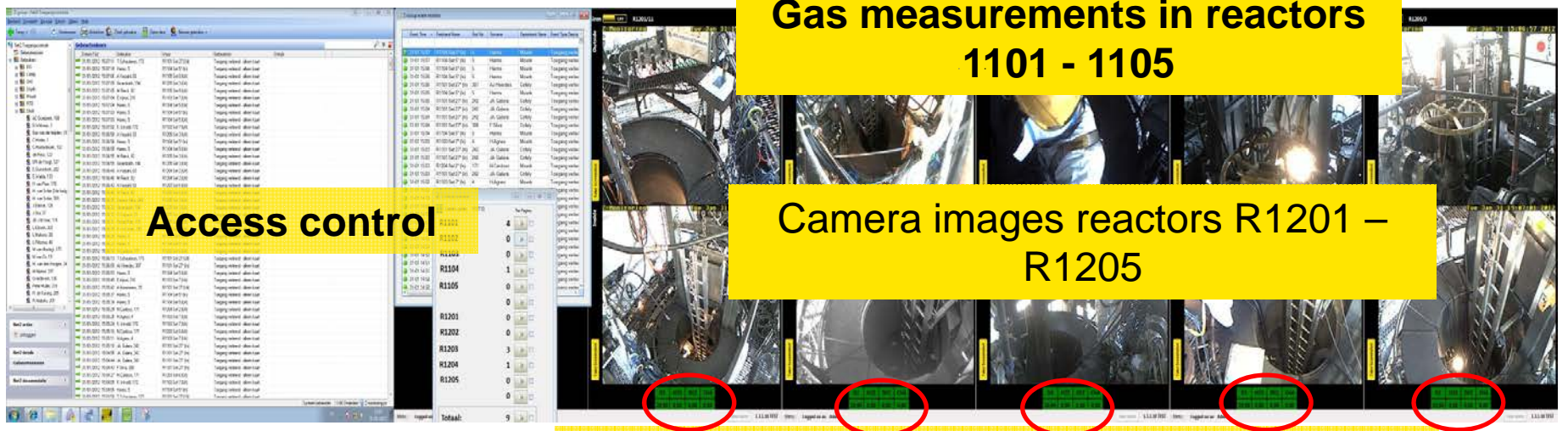
Technical features Central Control Room (CCR)



MONITORING



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



	Monitoring Operators Safety & Rescue Supervisors	Monitoring Operators Safety & Rescue Supervisors
Number of work spots	<u>INSIDE</u> in the CCU	<u>OUTSIDE</u> in the field
1 – 12	1	1
12-24	2	2
24-36	3	3
36-48	4	4
48-60	5	5



“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



SYSTEMS MANAGEMENT

Z SYSTEMS
MEMBER OF THE Z-GROUP

Z-TRACKER





Z-Tracker

Personal track & trace device



TRACKER

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



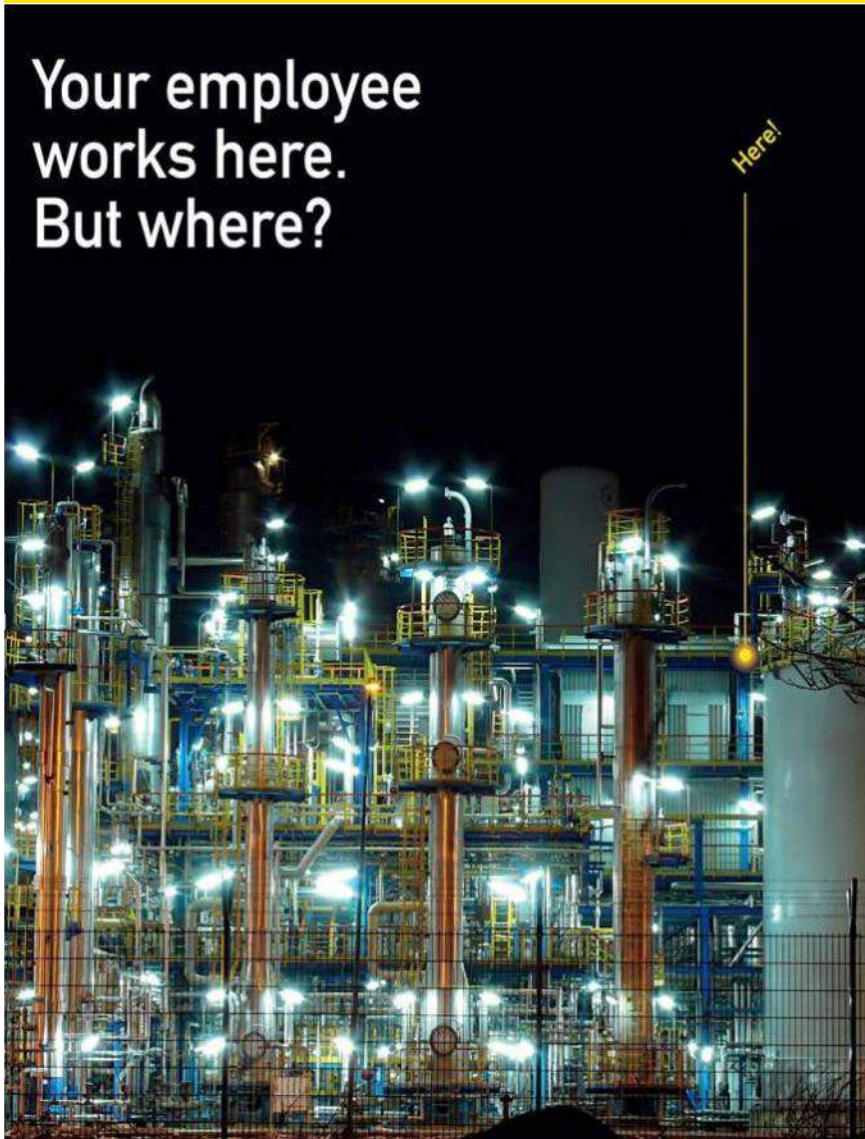
Z-Tracker

Areas of application



TRACKER

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

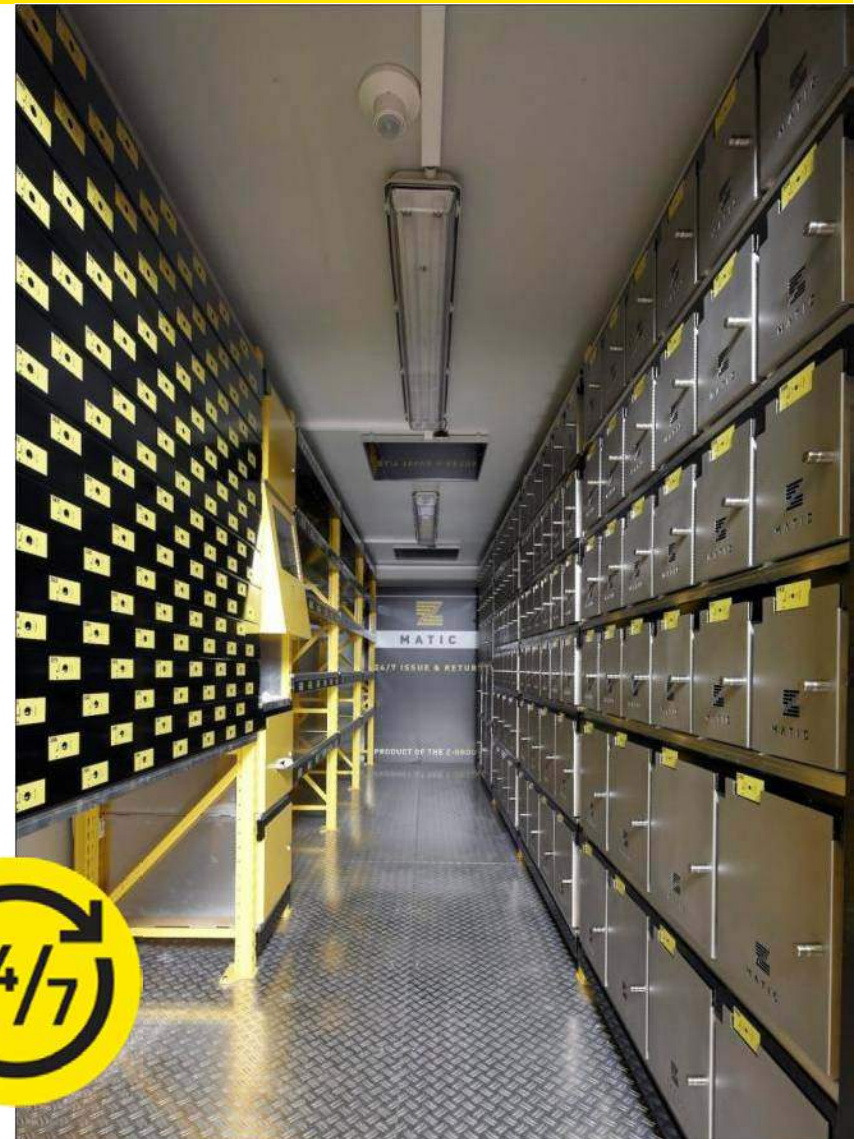


Z-Matic

24/7 issue & return



- 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





WWW.Z-SYSTEMS.BE

 **SYSTEMS**
MEMBER OF THE **Z-GROUP**