

Alarmmanagement = datamanagement



Inzicht in de alarmenberg

● ● ● Productie Proces Automatisering

● ● ● 25 januari 2024 | Van der Valk Hotel, Vianen



Even voorstellen



- Léon Verhaegen
- Waterschapsbedrijf Limburg



- Peter Withagen
- Croonwolter&dros B.V.





Waterschapsbedrijf Limburg

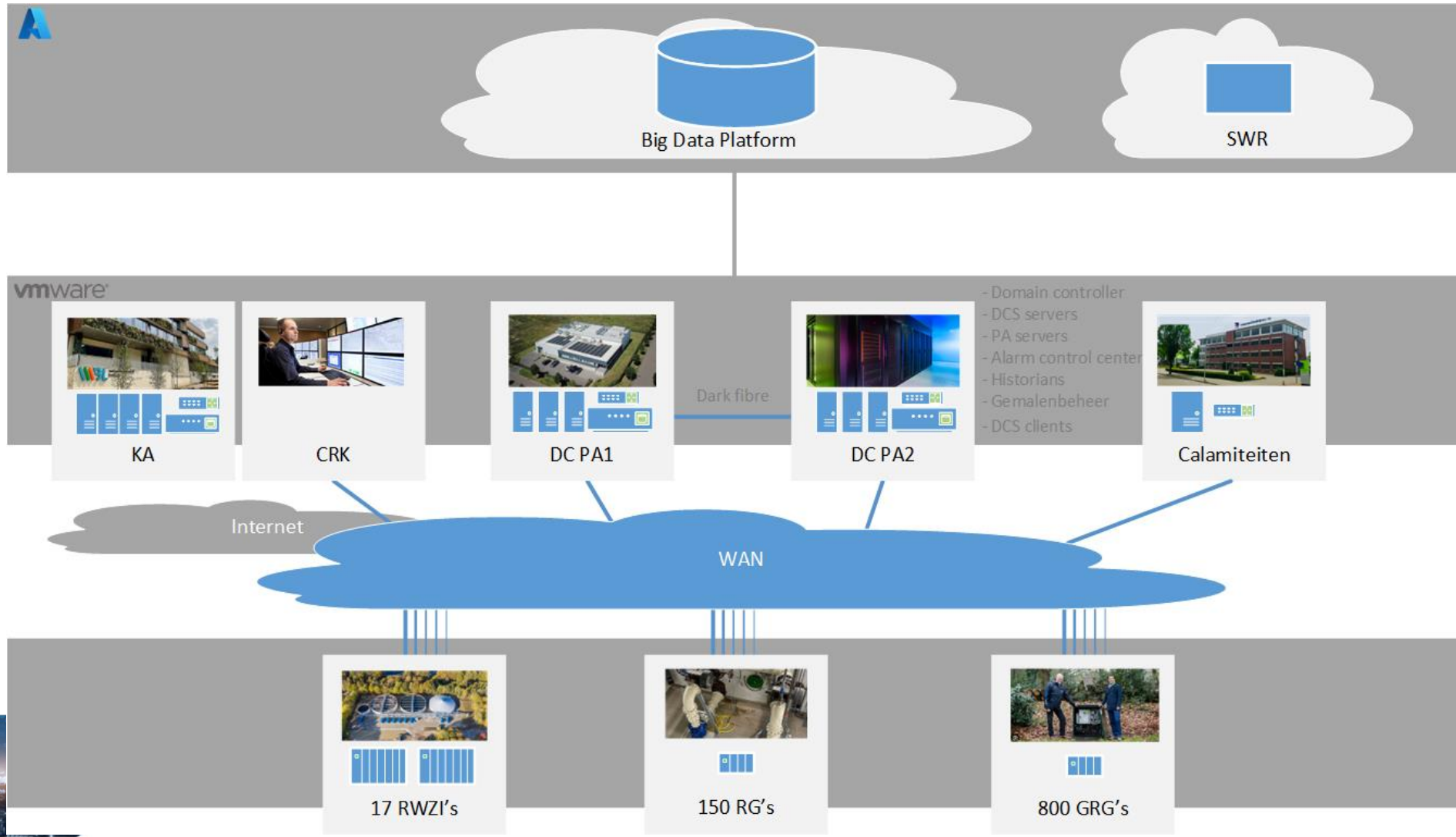
- 100% dochter van Waterschap Limburg
- Verantwoordelijk voor het zuiveren van afvalwater
- 17 rioolwaterzuiveringen, circa 150 waterschapsgemalen
- Voor 10 gemeenten in Limburg gemalenbeheer



●
● Productie Proces Automatisering

○
○ 25 januari 2024 | Van der Valk Hotel, Vianen

Automatiseringslandschap bij WBL



Probleemstelling

- Meer meten
- Meer systemen
- Meer centralisatie
- Meer, meer, meer...

| Event | Area | Quantity | Average Time | Average Time Before ACK | Total duration | Priority | |
|--------------------|---|--------------|--------------|-------------------------|----------------|-------------|----|
| LCS12IPid | Column Reboiler Temperature PV - Low alarm limit viol | Distillation | 3 | 2510.000 | 1:01:53 | 1:44:40.000 | 0 |
| T851Men | Column Temperature Limit value (high) for the positive | Distillation | 4 | 1.790 | 45.750 | 7.000 | 0 |
| T851Men | Column Temperature Limit value (high) for the negativ | Distillation | 3 | 5.323 | 1:00.669 | 16.000 | 0 |
| T853Men | Column Temperature Limit value (high) for the positive | Distillation | 3 | 1.696 | 1:01.333 | 8.000 | 0 |
| T853Men | Column Temperature Limit value (high) for the positive | Distillation | 3 | 1.696 | 1:01.333 | 8.000 | 0 |
| LIT-402Men | Reactor level PV - Low alarm limit violated | Reactor1 | 3 | 1:35:25.000 | 0,000 | 1:35:25.000 | 0 |
| TIC-401IPid | Reactor Temperature Control PV - Low alarm limit violat | Reactor1 | 3 | 1:35:25.000 | 0,000 | 1:35:25.000 | 0 |
| Ti-2104Men | Storage Tank Temperature PV - Low alarm limit violate | Storage | 3 | 1:35:25.000 | 0,000 | 1:35:25.000 | 0 |
| LIT-2102Men | Storage Tank Level PV - Low alarm limit violated | Storage | 3 | 1:35:25.000 | 0,000 | 1:35:25.000 | 0 |
| TIC-1019PID | RX_A Steam Flow External error has occurred | Reactor_A | 3 | 1:50,0 | 0,000 | 3,000 | 14 |
| FL-312MenAnalog | Product Flow PV:?? - Low alarm limit violated | Reactor_A | 3 | 1:35:25.000 | 0,000 | 1:35:25.000 | 15 |
| TIC-3019PID | RX_C Steam Flow External error has occurred | Reactor_C | 3 | 0.696 | 0,000 | 2,000 | 14 |
| FL-312MenAnalog | Product Flow PV:?? - Low alarm limit violated | Reactor_C | 3 | 1:35:25.000 | 0,000 | 1:35:25.000 | 15 |
| FL-312MenAnalog | Product Flow PV:?? - Low alarm limit violated | Plant | 3 | 1:35:25.000 | 0,000 | 1:35:25.000 | 15 |
| TIC-2019PID | RX_B Steam Flow External error has occurred | Plant | 3 | 1:35:25.000 | 0,000 | 1:35:25.000 | 14 |
| LIT-402Men | Reactor level PV - Low warning limit violated | Reactor1 | 3 | 1:35:25.000 | 0,000 | 1:35:25.000 | 0 |
| TIC-401IPid | Reactor Temperature Control PV - Low warning limit vi | Reactor1 | 3 | 1:35:25.000 | 0,000 | 1:35:25.000 | 0 |
| Ti-2104Men | Storage Tank Temperature PV - Low warning limit violat | Storage | 3 | 1:35:25.000 | 0,000 | 1:35:25.000 | 0 |
| LIT-2102Men | Storage Tank Level PV - Low warning limit violated | Storage | 3 | 1:35:25.000 | 0,000 | 1:35:25.000 | 0 |
| LCS12IPid | Column Reboiler Temperature PV - Low warning limit v | Distillation | 3 | 5218.500 | 1:22.500 | 1:46:37.000 | 0 |
| ESQHSFSDICause-AL1 | Causes ?? Trip Tag active | Plant | 3 | 1:35:25.000 | 0,000 | 1:35:25.000 | 0 |
| TIC-401IPid | Reactor Temperature Control PV - Low tolerance limit | Reactor1 | 3 | 1:35:25.000 | 0,000 | 1:35:25.000 | 0 |
| GenioSIRIUS | Low alarm | Storage | 3 | 6:35:09.000 | 2:07.000 | 6:35:09.000 | 0 |
| GenioCOSINUS | Low alarm | Storage | 2 | 1:35:25.000 | 0,000 | 1:35:25.000 | 0 |
| GenioSIRIUS | Low warning | Storage | 3 | 6:35:12.000 | 2:10.000 | 6:35:12.000 | 0 |
| GenioCOSINUS | Low warning | Storage | 3 | 1:35:25.000 | 0,000 | 1:35:25.000 | 0 |
| LALL_214MenDigital | Product Tank Level External error has occurred | Plant | 13 | 1:35:25.000 | 0,000 | 1:35:25.000 | 14 |
| GenioSIRIUS | High warning | Storage | 3 | 1:35:25.000 | 0,000 | 1:35:25.000 | 0 |
| GenioCOSINUS | High warning | Storage | 3 | 1:35:25.000 | 0,000 | 1:35:25.000 | 0 |
| PU-302MenAnalog | RX_B Pressure External error has occurred | Plant | 3 | 1:35:25.000 | 0,000 | 1:35:25.000 | 14 |
| GenioSIRIUS | High alarm | Storage | 3 | 1:35:25.000 | 0,000 | 1:35:25.000 | 0 |
| GenioCOSINUS | High alarm | Storage | 3 | 1:35:25.000 | 0,000 | 1:35:25.000 | 0 |
| PU-402Men | Circulation/Discharge Pump Motor feedback error | Storage | 3 | 1:35:25.000 | 0,000 | 1:35:25.000 | 0 |
| LS-2103Men | High Level Out - Binary value set | Storage | 2 | 1:35:25.000 | 0,000 | 1:35:25.000 | 0 |
| LS-403Men | High Level Out - Binary value set | Reactor1 | 3 | 1:35:25.000 | 0,000 | 1:35:25.000 | 0 |
| ESD_FAULTESD_FAULT | Out - Binary value set | Plant | 3 | 0,000 | 0,000 | 0,000 | 0 |
| ESD_FAULTESD_FAULT | Out - Binary value set | Plant | 3 | 0,000 | 0,000 | 0,000 | 0 |



Boiler Operator Jeff Craigie sits in the Boiler Room and monitors flows, temperatures and pressures of the boilers and feed-water system. Photo by Ryan Solomon



Productie Proces Automatisering

25 januari 2024 | Van der Valk Hotel, Vianen



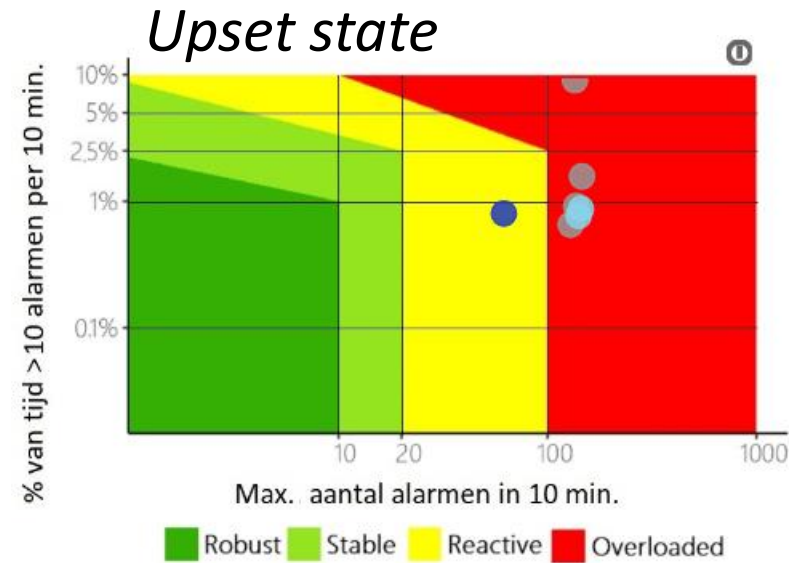
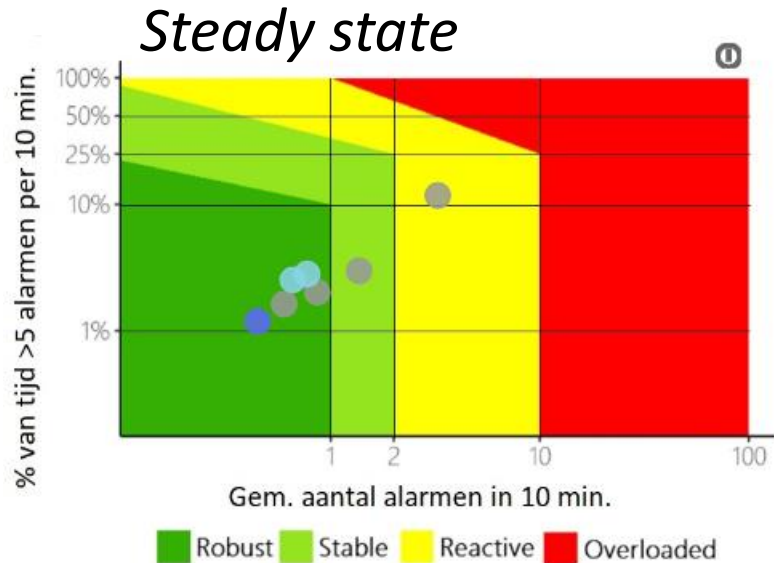
Normen

- Operator centraal: wat kan een mens overzien?
- EEMUA 191 richtlijn
Engineering Equipment and Materials Users Association
- IEC 62682
- ISA-18.2



Alarmmanagement KPI's: aantal alarmen

Aantal alarmen per 10 minuten

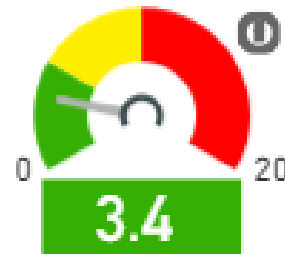


KPI's: Openstaande alarmen

- Alarmen die te lang open staan vertroebelen de aandacht voor nieuwe alarmen

| Source | Event | Area | Quantity | Average Time | Average Time Before ACH | Total duration | Priority |
|---------|---|--------------|----------|--------------|-------------------------|----------------|----------|
| 180304M | Column Reboiler Temperature PV - Low alarm limit violated | Distillation | 1 | 0.000 | 0.000 | 0.000 | 0 |
| 180304M | Column Temperature Limit value (high) for the positive Distillation | Distillation | 4 | 1.700 | 48.790 | 7.000 | 0 |
| 180304M | Column Temperature Limit value (high) for the negative Distillation | Distillation | 3 | 1.200 | 100.000 | 0.000 | 0 |
| 180304M | Column Temperature Limit value (high) for the positive Distillation | Distillation | 3 | 1.668 | 101.333 | 0.000 | 0 |
| 180304M | Column Temperature Limit value (high) for the positive Distillation | Distillation | 3 | 1.668 | 101.333 | 0.000 | 0 |
| 180304M | Reactor level PV - Low alarm limit violated | Reactor1 | 3 | 1.000 | 0.000 | 0.000 | 0 |
| 180304M | Reactor Temperature Control PV - Low alarm limit violated | Reactor1 | 3 | 1.000 | 0.000 | 0.000 | 0 |
| 180304M | Reactor Temperature Control PV - Low alarm limit violated | Reactor1 | 3 | 1.000 | 0.000 | 0.000 | 0 |
| 180304M | Storage Tank Temperature PV - Low alarm limit violated | Storage | 3 | 1.000 | 0.000 | 0.000 | 0 |
| 180304M | Storage Tank Level PV - Low alarm limit violated | Storage | 3 | 1.000 | 0.000 | 0.000 | 0 |
| 180304M | Storage Tank Level PV - Low alarm limit violated | Storage | 3 | 1.000 | 0.000 | 0.000 | 0 |
| 180304M | IX-A Steam Flow External error has occurred | Reactor_A | 3 | 1.000 | 0.000 | 0.000 | 14 |
| 180304M | Product Flow PV PV - Low alarm limit violated | Reactor_A | 3 | 1.000 | 0.000 | 0.000 | 15 |
| 180304M | IX-C Steam Flow External error has occurred | Reactor_C | 3 | 0.000 | 0.000 | 0.000 | 14 |
| 180304M | Product Flow PV PV - Low alarm limit violated | Reactor_C | 3 | 1.000 | 0.000 | 0.000 | 15 |
| 180304M | Product Flow PV PV - Low alarm limit violated | Plant | 3 | 1.000 | 0.000 | 0.000 | 15 |
| 180304M | IX-B Steam Flow External error has occurred | Plant | 3 | 1.000 | 0.000 | 0.000 | 14 |
| 180304M | Reactor level PV - Low warning limit violated | Reactor1 | 3 | 1.000 | 0.000 | 0.000 | 0 |
| 180304M | Reactor Temperature Control PV - Low warning limit violated | Reactor1 | 3 | 1.000 | 0.000 | 0.000 | 0 |
| 180304M | Storage Tank Temperature PV - Low warning limit violated | Storage | 3 | 1.000 | 0.000 | 0.000 | 0 |
| 180304M | Storage Tank Level PV - Low warning limit violated | Storage | 3 | 1.000 | 0.000 | 0.000 | 0 |
| 180304M | Column Reboiler Temperature PV - Low warning limit v Distillation | Distillation | 3 | 83.800 | 100.000 | 1.667.000 | 0 |
| 180304M | Reactor Temperature Control PV - Low tolerance limit Reactor1 | Reactor1 | 3 | 1.000 | 0.000 | 0.000 | 0 |
| 180304M | Low alarm | Storage | 3 | 0.000 | 0.000 | 0.000 | 0 |
| 180304M | Low warning | Storage | 3 | 6.000 | 2.000.000 | 6.000.000 | 0 |
| 180304M | Low warning | Storage | 3 | 1.000 | 0.000 | 0.000 | 0 |
| 180304M | Product Tank Level External error has occurred | Plant | 3 | 1.000 | 0.000 | 0.000 | 14 |
| 180304M | High warning | Storage | 3 | 1.000 | 0.000 | 0.000 | 0 |
| 180304M | High warning | Storage | 3 | 1.000 | 0.000 | 0.000 | 0 |
| 180304M | High alarm | Storage | 3 | 1.000 | 0.000 | 0.000 | 0 |
| 180304M | High alarm | Storage | 3 | 1.000 | 0.000 | 0.000 | 0 |
| 180304M | High alarm | Storage | 3 | 1.000 | 0.000 | 0.000 | 0 |
| 180304M | High alarm | Storage | 3 | 1.000 | 0.000 | 0.000 | 0 |
| 180304M | High Level Out - Binary value set | Reactor1 | 3 | 1.000 | 0.000 | 0.000 | 0 |
| 180304M | High Level Out - Binary value set | Reactor1 | 3 | 1.000 | 0.000 | 0.000 | 0 |
| 180304M | High Level Out - Binary value set | Plant | 3 | 0.000 | 0.000 | 0.000 | 0 |

Openstaande alarmen



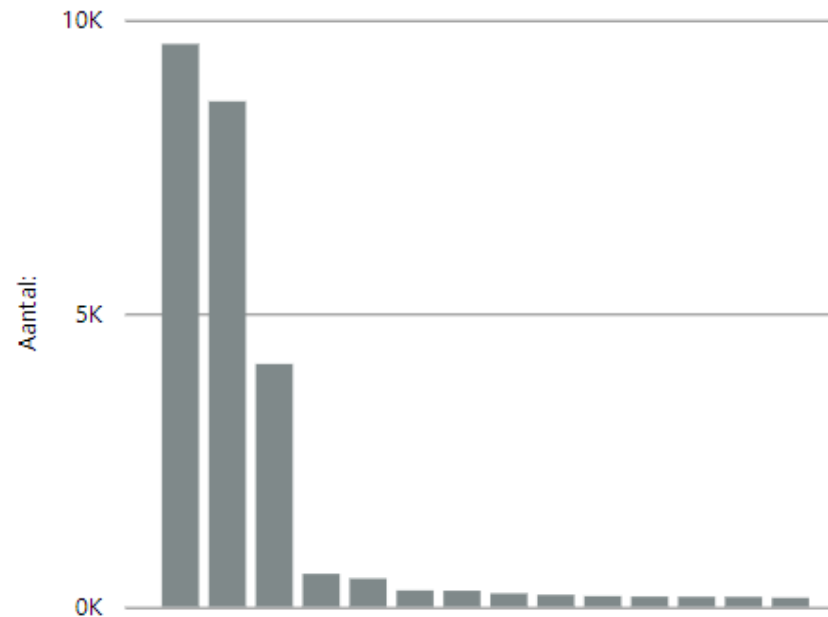
Productie Proces Automatisering

25 januari 2024 | Van der Valk Hotel, Vianen

KPI's: Meest voorkomende alarmen

- Percentage van alarmen dat veroorzaakt wordt door de top 10

Meest voorkomende alarmen:



Aanpak

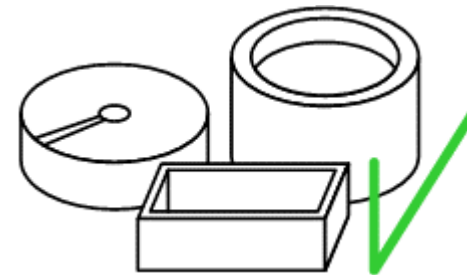
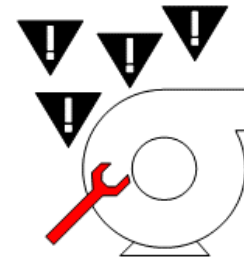
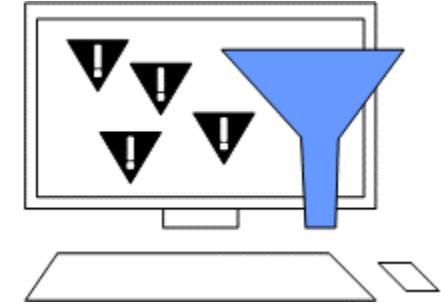
Uitvoeren van scan, interactieve analyse, verbeteren situatie

- Opvragen alarmen
- Cleaning, conversie en verrijking
- Dashboard tbv periodieke analyse
- Interactieve sessie
- Rapport, conclusie, acties



Acties

- Verbeteren inrichting alarmen (onnodige alarmen voorkomen)
- Veldproblemen oplossen – “stoorzenders”
- Slimmer alarmeren – aandacht voor proces

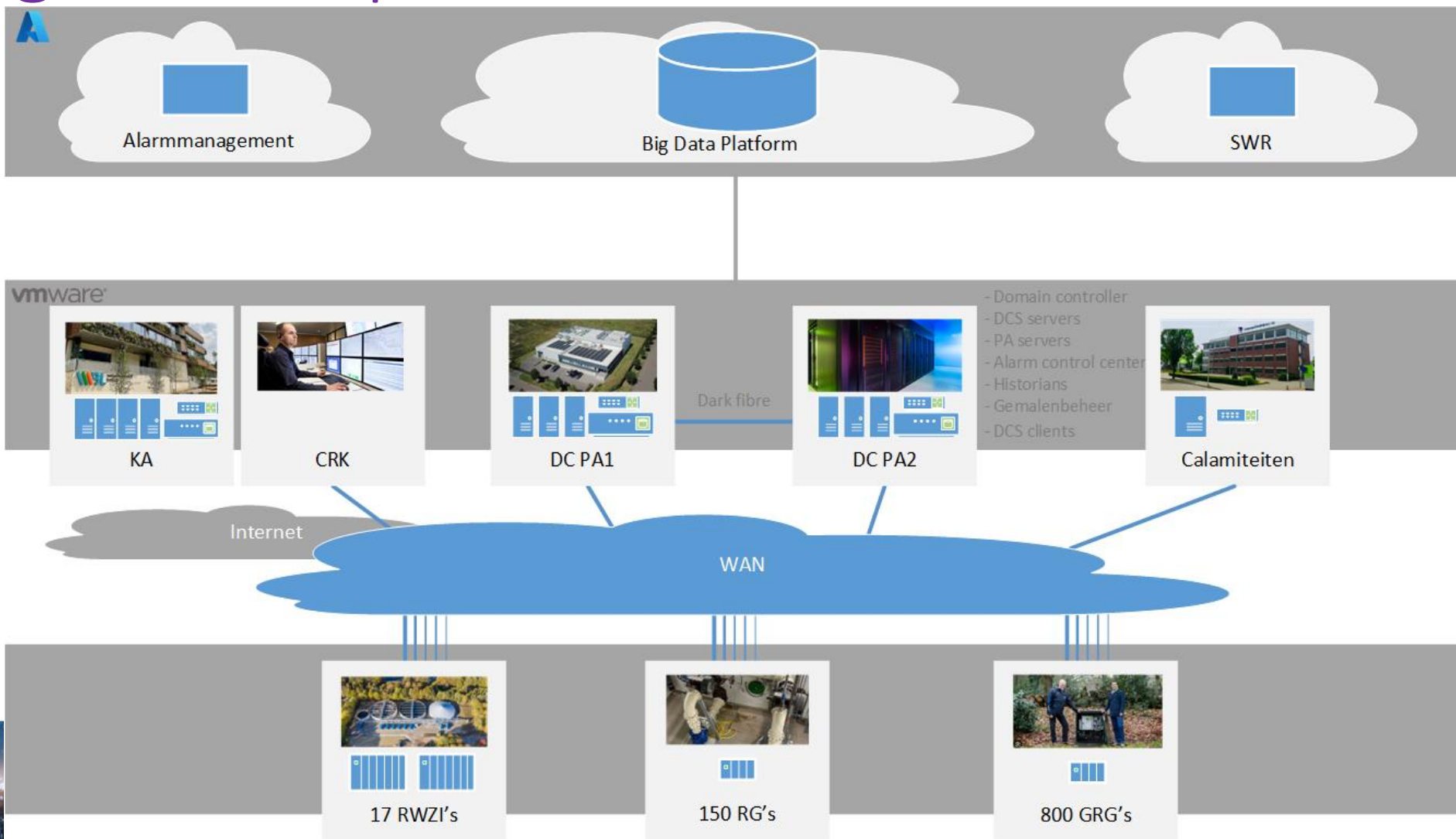


Alarmmanagement bij WBL

- Dashboard 'live' gekoppeld aan historian
- Direct inzicht geeft andere kijk op de data, en andere behoefte aan inzichten
- Op dit moment alle data van procesautomatisering 17 RWZI's, 550 gemalen, en indirect van 800 gemeentelijke gemalen



Volgende stap



Contact



Peter Withagen

Manager watermarkt

06-15078136 | peter.withagen@croonwolterendros.nl

Croonwolter&dros BV



Productie Proces Automatisering

25 januari 2024 | Van der Valk Hotel, Vianen