

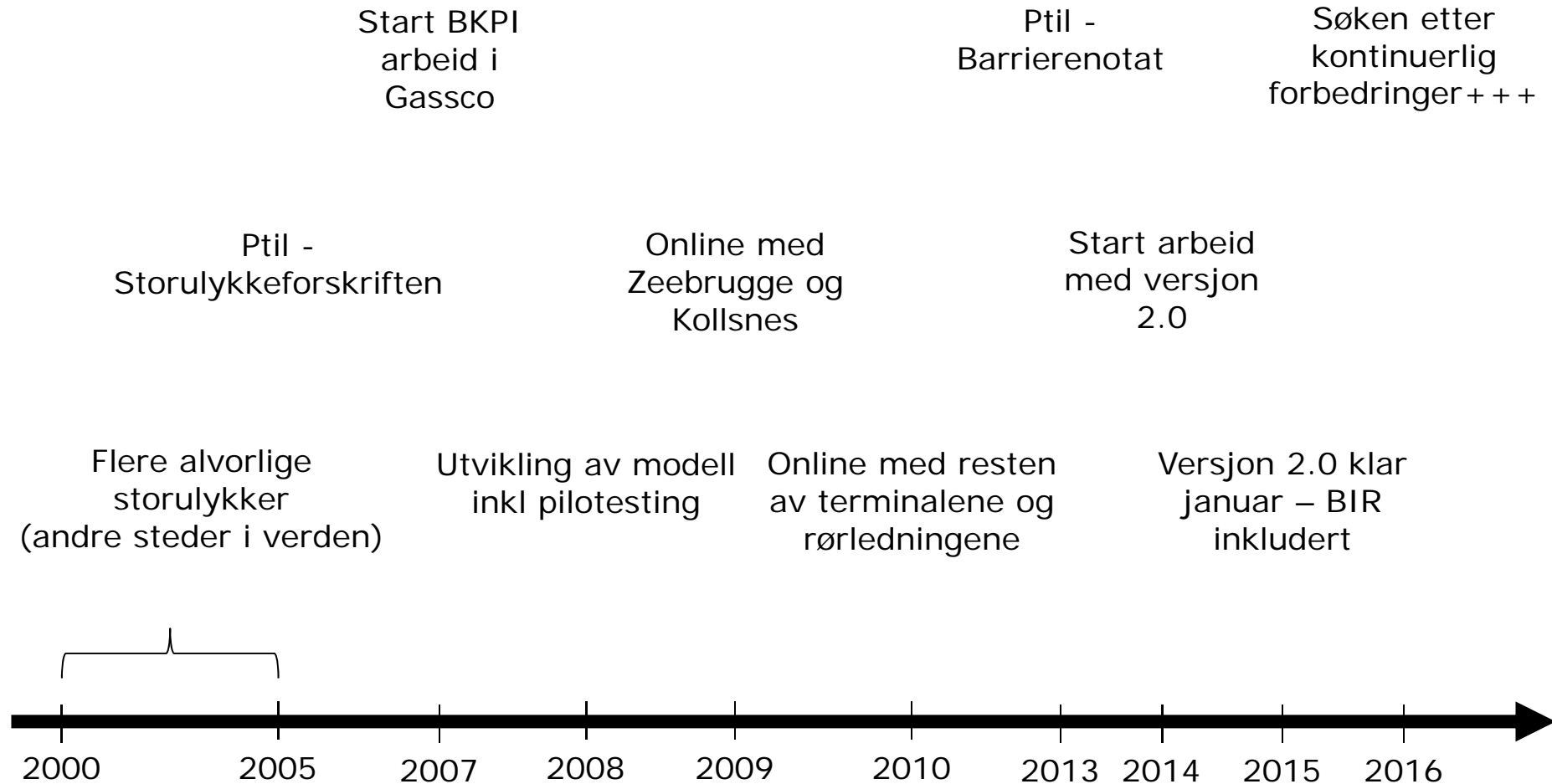


Barrier KPI modell

ESRA seminar 08.06.2016

Lars Bjarne Røvang – sr.rådgiver

Når – hvorfor og hvordan? Barriere KPI i Gassco



Gassco Barriere KPI hoved visning

PMG << March 2016 >> Gassled > Gassled 2016 Lars Bjarne Røvang Search...

Gassled 2016

Strategic Initiatives Risk assessments Reports Comments Barrier KPI

HSE&Q					
Name	Actual	Target	Status	Trend	Sh
Represent best practice in health, safety and the environment as well as quality					
KPI 1	2.40	1.60			
KPI 2	1.29	0.00			
KPI 3	1.00	0.00			
IT – security – user awareness and system robustness according to plan (%)					
Barrier Integrity Indicator Gassco					
KPI 4	40.20	24.90			

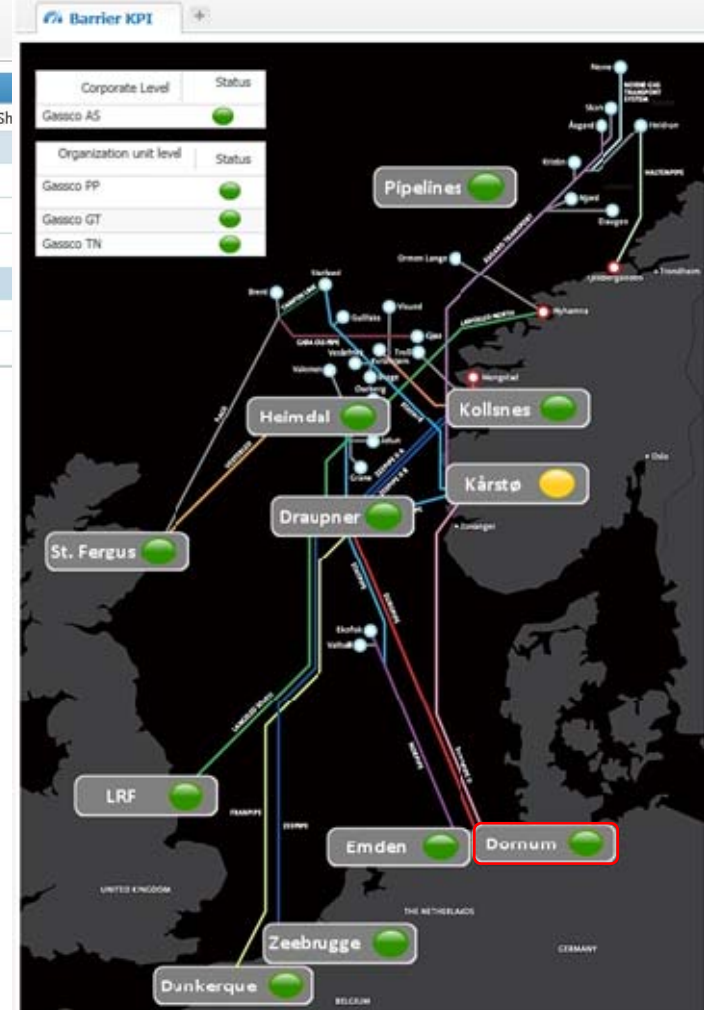
Barrier Integrity Indicator Gassco

The barrier integrity is acceptable based on operational measures and conditions combined with long-term mitigating actions.

Key findings:

- Implementation of mitigation measures is ongoing and design review of piping, vessels and valves. Several mitigating actions are ongoing.
- Development of mitigation measures is ongoing and design review of piping, vessels and valves. Several mitigating actions are ongoing.
- Implementation of mitigation measures is ongoing and design review of piping, vessels and valves. Several mitigating actions are ongoing.

Overall Status: **Acceptable**



Barriere KPI gassterminal view

Barrier KPI V2 - Dornum

Barrier functions Performance standards QA

Dornum

Status Trend



Name Status
Asset assessment status:

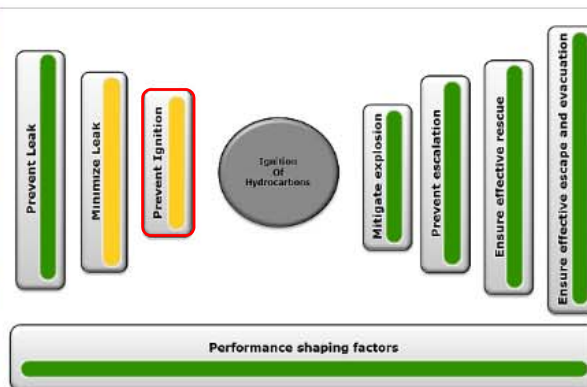
Comment for the installation + Add Comment

The barrier integrity is acceptable.
Posted by: Uwe Dannehl March 2016

All comments made for Barrier Elements

Sort by
One safety critical valve failed during the ESD-test EP1 in September 2014. The failure has been repaired and the valve has been tested successfully.
Location: Safety critical ESD valves Posted by: Olav Rasmussen Mar 1, 2016

Bow-tie model



All Performance shaping factors

Name	# this month	Status	Trend
PM backlog on safety critical equipment	0	Green	Yellow arrow
CM backlog on safety critical equipment	0	Green	Yellow arrow
Critical audit findings	0	Green	Yellow arrow
Overdue actions on critical audit findings	0	Green	Yellow arrow
Override indicator	0	Green	Yellow arrow
Open notifications related to safety critical failure modes	0	Green	Yellow arrow

Barrier Elements

Name	Failures this month #	Tests this month #	AFR last 24m %	S	Trend
Safety critical corrosion findin...				Green	Yellow arrow
HIPPS valve	0	0	0.00	Green	Green arrow
Safety critical process sensors	0	2	0.00	Green	Green arrow
Safety critical PSD valves	0	2	0.00	Green	Green arrow
PSV	0	0	0.00	Green	Green arrow
HC gas detectors	0	0	0.00	Green	Green arrow
ESD push button	0	0	0.00	Green	Green arrow
ESD Valves, function test only	0	0	0.00	Green	Green arrow
Safety critical ESD valves	0	0	4.17	Red	Red arrow
Blowdown valves	0	0	0.00	Green	Green arrow
HVAC dampers	0	0	0.00	Green	Green arrow
Fire monitors	0	56	0.32	Green	Green arrow
Fire water pumps	0	2	0.00	Green	Green arrow
Manual call points	0	0	0.00	Green	Green arrow
Smoke detectors	0	0	0.00	Green	Green arrow
Flame detectors	0	0	0.00	Green	Green arrow
Heat detectors	0	0	0.00	Green	Green arrow
PA system	0	0	0.00	Green	Green arrow
Emergency lightening	0	0	0.00	Green	Green arrow
Emergency power generator	0	1	0.00	Green	Green arrow
UPS capacity	0	1	0.00	Green	Green arrow


Dornum Prevent Ignition view

Prevent ignition

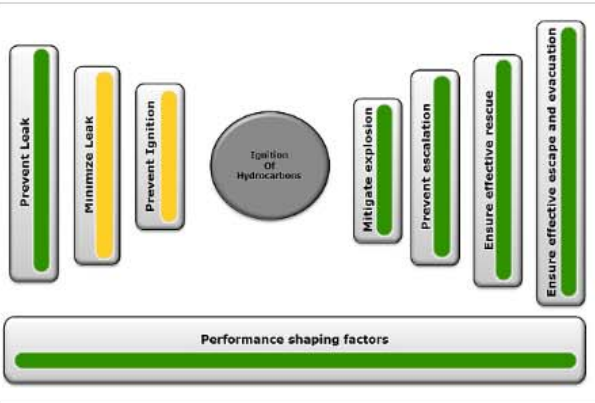
Barrier functions

Dornum

Back to map



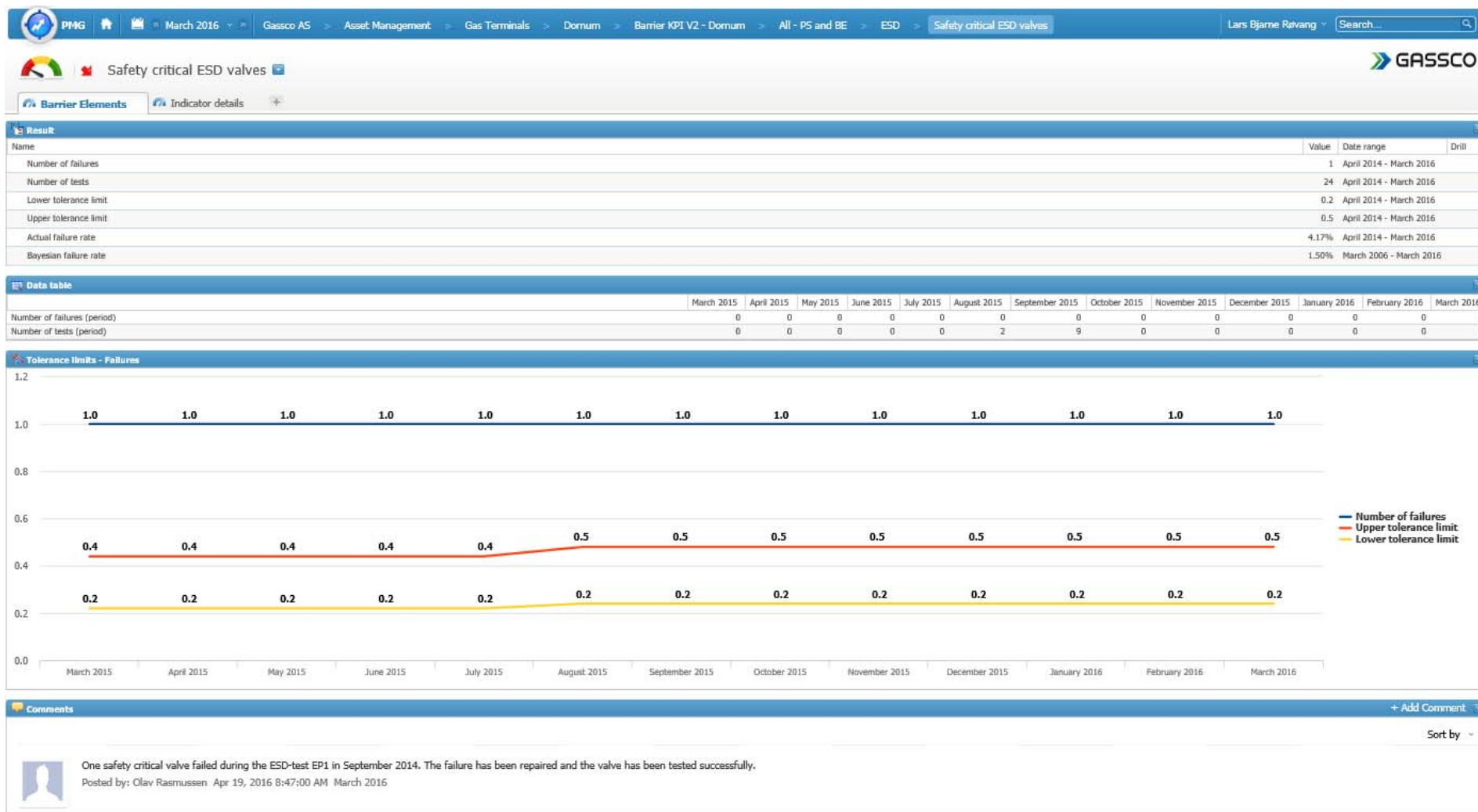
Bow-tie model



Barrier Elements to Prevent ignition

Name	Status	Trend
ESD Valves, function test only		
ESD push button		
HC gas detectors		
HVAC dampers		
Safety critical ESD valves		

Dornum safety critical ESD valves



Barriere KPI gassterminal view

Dornum



Name: _____ Status: _____
 Asset assessment status: _____

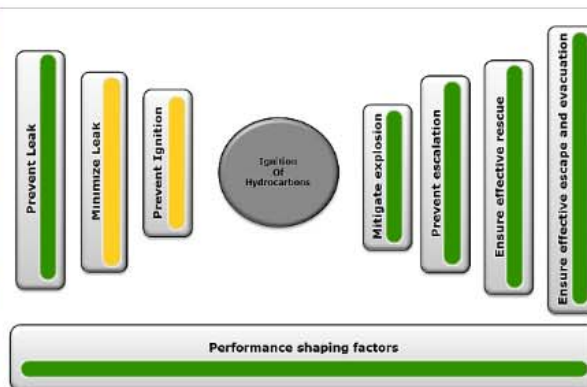
Comment for the installation + Add Comment

The barrier integrity is acceptable.
 Posted by: Uwe Dannehl March 2016

All comments made for Barrier Elements

Sort by
 One safety critical valve failed during the ESD-test EP1 in September 2014. The failure has been repaired and the valve has been tested successfully.
 Location: Safety critical ESD valves Posted by: Olav Rasmussen Mar 1, 2016

Bow-tie model



All Performance shaping factors

Name	# this month	Status	Trend
PM backlog on safety critical equipment	0	Green	Down
CM backlog on safety critical equipment	0	Green	Down
Critical audit findings	0	Green	Down
Overdue actions on critical audit findings	0	Green	Down
Override indicator	0	Green	Down
Open notifications related to safety critical failure modes	0	Green	Down

Barrier Elements

Name	Failures this month #	Tests this month #	AFR last 24m %	S	Trend
Safety critical corrosion findin...				Green	Down
HIPPS valve	0	0	0.00	Green	Down
Safety critical process sensors	0	2	0.00	Green	Down
Safety critical PSD valves	0	2	0.00	Green	Down
PSV	0	0	0.00	Green	Down
HC gas detectors	0	0	0.00	Green	Down
ESD push button	0	0	0.00	Green	Down
ESD Valves, function test only	0	0	0.00	Green	Down
Safety critical ESD valves	0	0	4.17	Red	Down
Blowdown valves	0	0	0.00	Green	Down
HVAC dampers	0	0	0.00	Green	Down
Fire monitors	0	56	0.32	Green	Down
Fire water pumps	0	2	0.00	Green	Down
Manual call points	0	0	0.00	Green	Down
Smoke detectors	0	0	0.00	Green	Down
Flame detectors	0	0	0.00	Green	Down
Heat detectors	0	0	0.00	Green	Down
PA system	0	0	0.00	Green	Down
Emergency lightening	0	0	0.00	Green	Down
Emergency power generator	0	1	0.00	Green	Down
UPS capacity	0	1	0.00	Green	Down



Performance standard view

Barrier KPI V2 - Dornum

Barrier functions Performance standards QA

Dornum



Name Asset assessment status: Status

Comment for the installation
Barrier integrity is acceptable. Deluge valves failures are repaired.
Posted by: Hans Mikal Bjørkhaug Mar 1, 2016

All comments made for Barrier Elements
Sort by
One safety critical valve failed during the ESD-test EP1 in September 2014. The failure has been repaired and the valve has been tested successfully.
Location: Safety critical ESD valves Posted by: Olav Rasmussen Mar 1, 2016

Performance Standards

Name	Status	Trend
Containment	●	↔
Process Safety	●	↔
Gas detection	●	↔
ESD	●	↔
Blowdown and vent system	●	↔
Natural ventilation and HVAC	●	↔
Active fire protection	●	↔
Fire detection	●	↔
Passive fire protection	●	↔
Alarm and communication	●	↔
Emergency power and lightening	●	↔

All Performance Shaping Factors

Name	Status	Trend
PH backlog on safety critical equipment	●	↔
CM backlog on safety critical equipment	●	↔
Critical audit findings	●	↔
Overdue actions on critical audit findings	●	↔
Override indicator	●	↔
Open notifications related to safety critical failure modes	●	↔

Barrier Elements

Name	AFR last 24m %	Status	Trend
Safety critical corrosion findings		●	↔
HIPPS valve	0.00	●	↔
Safety critical process sensors	0.00	●	↔
Safety critical PSD valves	0.00	●	↔
PSV	0.00	●	↔
HC gas detectors	0.00	●	↔
ESD push button	0.00	●	↔
ESD Valves, function test only	0.00	●	↔
Safety critical ESD valves	4.17	●	↔
Blowdown valves	0.00	●	↔
HVAC dampers	0.00	●	↔
Fire monitors	0.32	●	↔
Fire water pumps	0.00	●	↔
Manual call points	0.00	●	↔
Smoke detectors	0.00	●	↔
Flame detectors	0.00	●	↔
Heat detectors	0.00	●	↔
PA system	0.00	●	↔
Emergency lightening	0.00	●	↔
Emergency power generator	0.00	●	↔
UPS capacity	0.00	●	↔

Barriere elementer for ESD funksjon på Dornum





ESD

Performance standards

Dornum

 Status


 Trend



[Back to map](#)

Name	Status

Performance Standards for Dornum

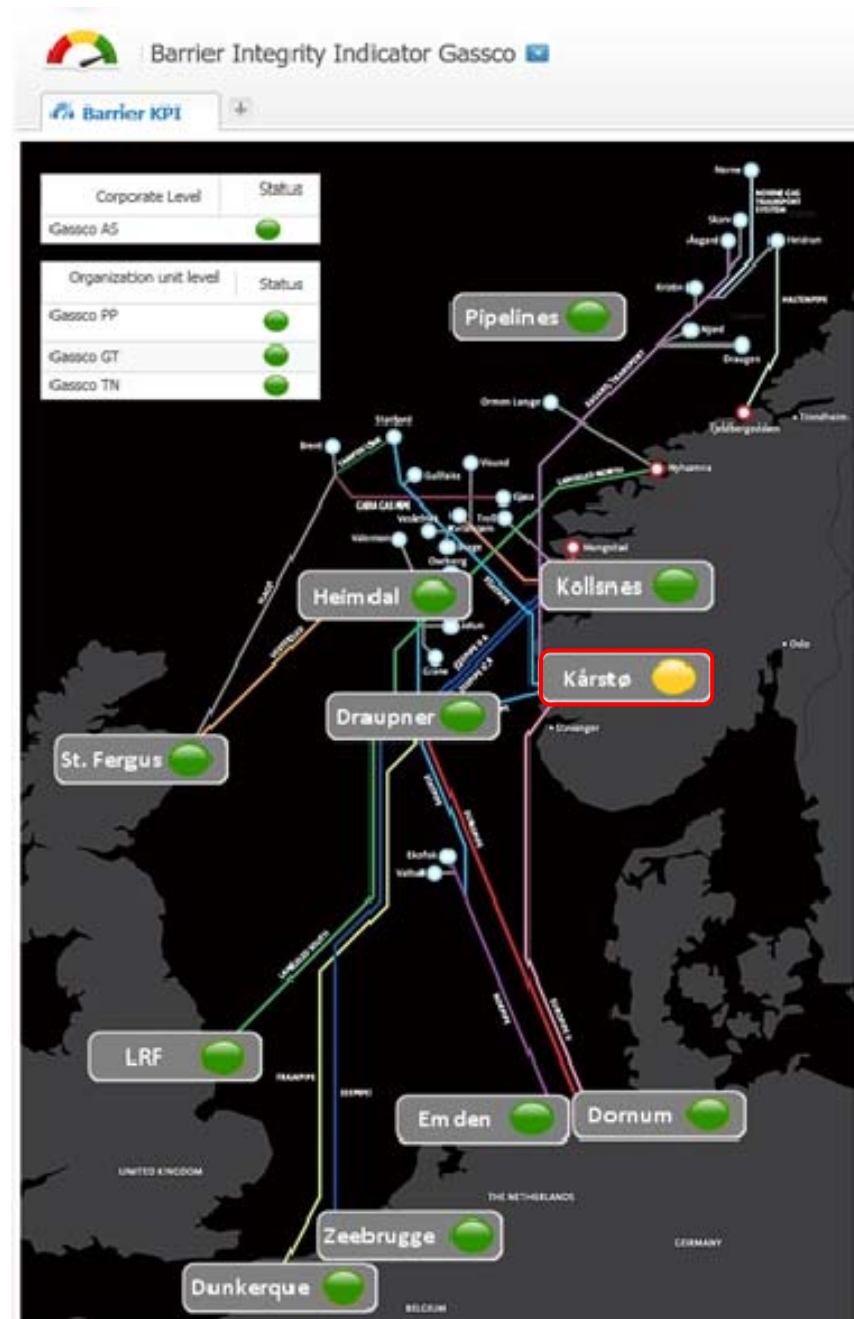
Name	Status	Trend
Containment		
Process Safety		
Gas detection		
ESD		
Blowdown and vent system		
Natural ventilation and HVAC		
Active fire protection		
Fire detection		
Passive fire protection		
Alarm and communication		
Emergency power and lightening		

Barrier Elements for ESD

Name	AFR last 24m %	Status	Trend
ESD Valves, function test only	0.00		
ESD push button	0.00		
Safety critical ESD valves	4.17		



Gassco Barriere KPI hovedvisning






Eksempel på Kårstø view (fra TIMP)

PMG | March 2016 | Gassco AS > Asset Management > Processing Plants > Kårstø > Barrier KPI V2 - Kårstø | Lars Bjarne Revang | Search...

Barrier KPI V2 - Kårstø


Status

Back to map



TIMP Status

TIMP anleggsvurdering Q1 2016



The diagram illustrates the TIMP anleggsvurdering Q1 2016, showing performance standards across various systems. It is divided into two main sections: 'Production related' and 'Operational related'. The 'Production related' section includes 'Core smart' (PS10), 'Inst. Safety Systems' (PS1, PS2, PS3), and 'Injection Control' (PS4, PS5). The 'Operational related' section includes 'Pollution Systems' (PS6, PS7, PS8), 'Power and Communication' (PS9), and 'Life saving' (PS14). A central 'Top event' is indicated by a blue circle.

Oppsummering:

Integritetsstatus: Integritet av tekniske barrierer har svekkelser og tiltak er iverksatt.

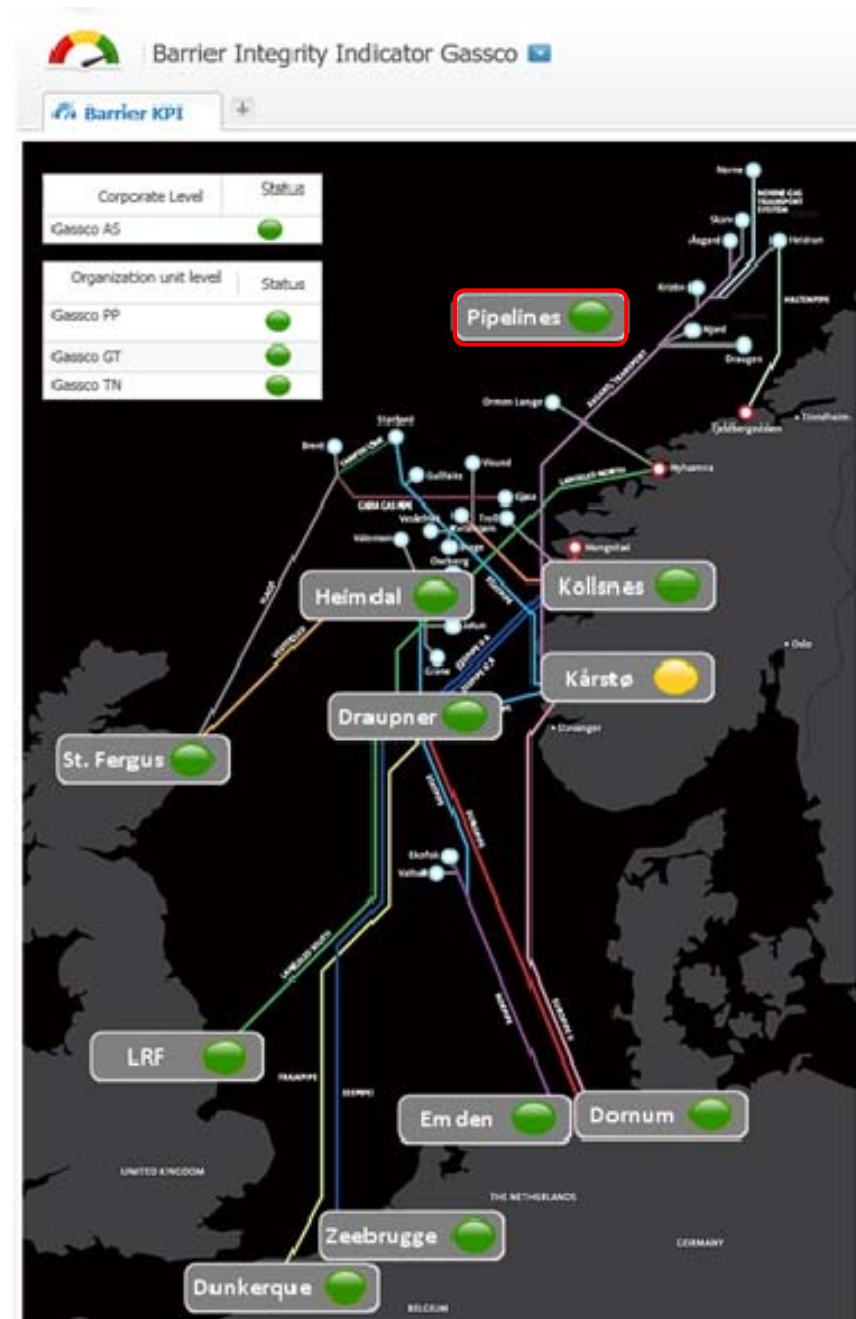
Til tross for at flere barrierer har karakter «D», anses risikoen for å være akseptabel med iverksatte operasjonelle/kortsiktige tiltak og begrensninger, i kombinasjon med langsiktige tiltak.

Det foreligger ingen endringer i PS karakterer siden forrige evaluering.

Comment for the Installation + Add Comment

The technical integrity is acceptable based on operational measures and restrictions combined with long-term
[Show more](#)
Posted by: Frank Marton Pedersen March 2016

Gassco Barriere KPI hovedvisning





Rørledninger - hovedvisning

PM4G March 2016 Gassco AS Pipelines Scorecard Lars Bjarne Revang Search...

Pipelines Scorecard

Result Barrier KPI Details

Collective Status Distribution

Current Month Previous Month

Month	Status
Current Month	100%
Previous Month	~95%

Installation/pipelines status

Name	Status	Trend
Aggregated Pipelines	●	▲

Pipelines

Name	Status	Trend
Inspection Findings		
Zeepipe 2B	●	▲
Europepe 1 Offshore	●	▲
Europepe 2	●	▲
Franpipe	●	▲
Haltenpipe	●	▲
Knarr FPSO to FLAGS	●	▲
Langed Pipeline North	●	▲
Langed Pipeline South	●	▲
Norne Gas Transport	●	▲
Norpipe (Norpipe Wye-B11)	●	▲
Norpipe (B11-H7 bypass)	●	▲
Norpipe (H7 bypass-NGT)	●	▲
Statpipe S31	●	▲
Statpipe S34	●	▲
Statpipe S35	●	▲
Statpipe S36	●	▲
Statpipe S37	●	▲
Statpipe S38	●	▲
Statpipe P39	●	▲
Tampen Link	●	▲
Utsira High Gas Pipe	●	▲
Zeepipe 1	●	▲
Zeepipe 1 (SLR-DRS)	●	▲
Zeepipe 2A	●	▲
Åsgard Transport	●	▲
Valemon	●	▲
Vesterled	●	▲
Kvitbjørn Gas Pipeline	●	▲
Europepe 1 Onshore	●	▲
Gjøa Gas Transport	●	▲
Oseberg Gas Transport	●	▲

Comment for the installation



+ Add Comment



Sort by

The barrier integrity is acceptable.
Posted by: Johannes Larsen Apr 19, 2016 9:53:35 AM March 2016



Rørledninger - detaljvisning

 Knarr FPSO to FLAGS 

 Result 


Result


Name	Value	Date range	Drill
Actual	2.00	May 2016	

Pipeline details for Knarr FPSO to FLAGS

Pipeline Name	System	Responsible	TSP	From	To	Length (km)	Diameter (")
Knarr FPSO to FLAGS	PL-3039			Knarr FPSO	Hot tap facility of 36" FLAGS pipeline	105,5	12

Knarr FPSO to FLAGS


SYNERGI PIPELINE [Help](#)  GASSCO\br

Gassco  > PL-3039 / 12" Gas Export - Knarr FPSO to > PL-3039 / 12" RSP - Knarr FPSO to FLAG >

Home | Pipeline Data | Risk | Activities | Condition | Reporting | Documents | Data Viewer | GIS | Admin

Overview | Line | **Line Details** | Section Details | Data Check | Area Details | Incident | CP Module

Details

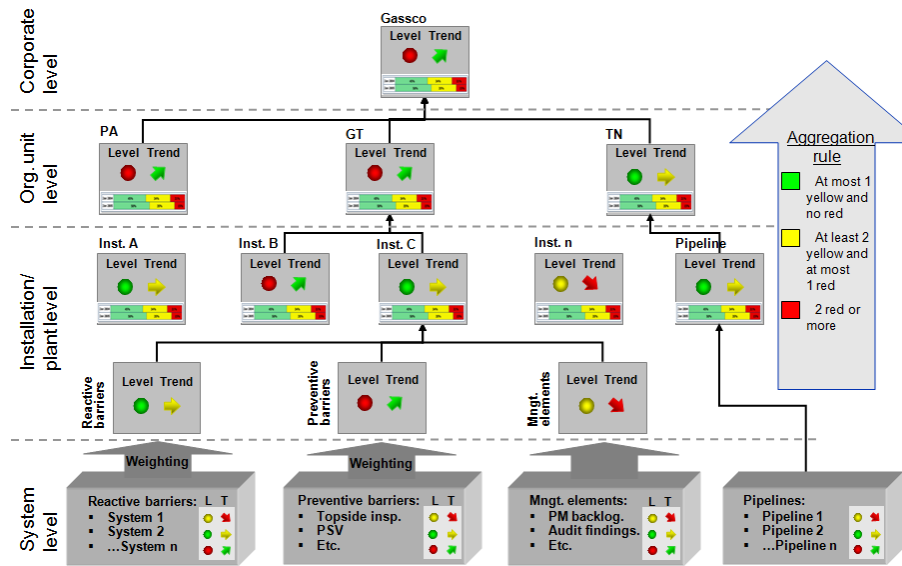
Versions: 16.12.2015 16:29 

Line ID: PL-3039 **Name:** 12" Gas Export - Knarr FPSO to FLAGS
Line group: Gassco **Risk matrix:** DNV-RP-F116
Line description: A 12" gas export pipeline from Knarr FPSO in Norwegian Sector (410 m water depth) to hot tap facility of 36" FLAGS pipeline in UK Sector (138.5 m water depth)

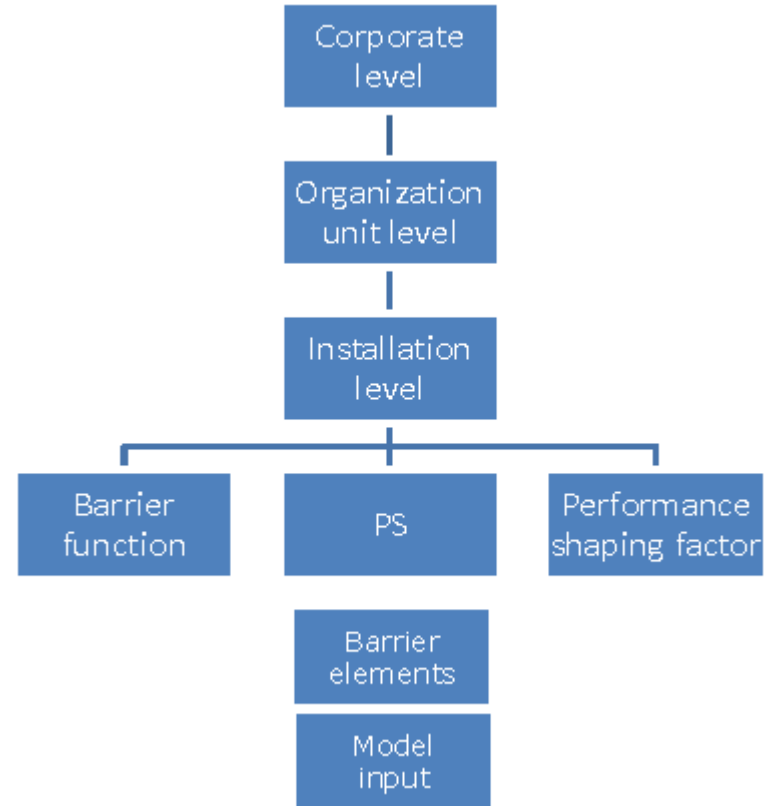
Location: Knarr FPSO From->To
FLAGS

Operating status: In service **Line function:** Export
Product: Gas **Product classification:** E
Product density: 200,00 **Design capacity:** 1320000,00

Gasscos modell struktur

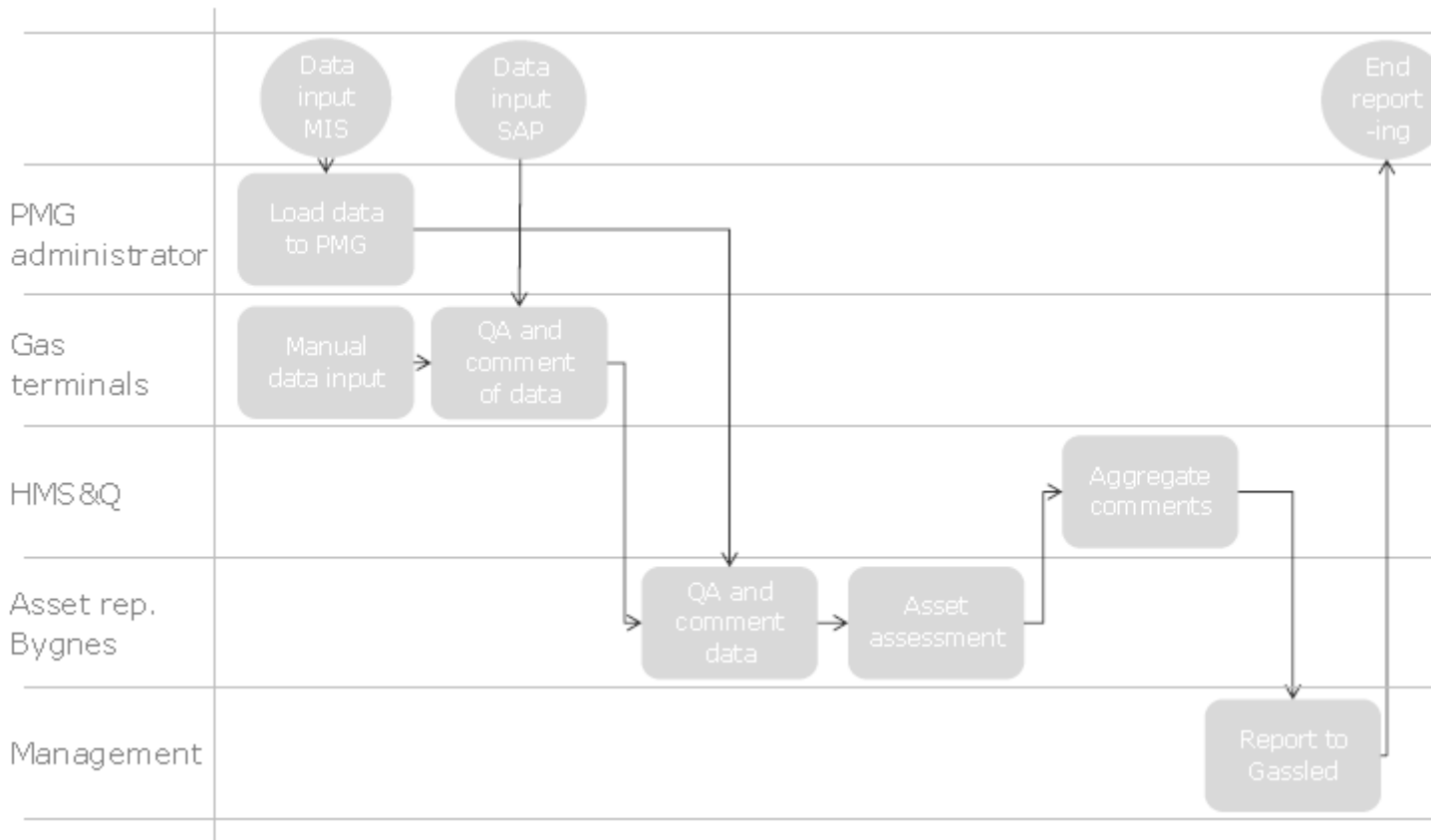


Versjon 1.0



Versjon 2.0

Arbeitsprozess



Erfaringer

«Versjon 1.0» - 2009-2014

- Modellen inndelt i 3 elementer:
 - Reaktive elementer
 - Proaktive elementer
 - Ledelses elementer
- Identifisere sikkerhetskritisk utsyr
- Økt oppmerksomhet
- Forenkling
- Rådata fra Statoil TIMP (fra 2011)
- Ulik status i TIMP vs BKPI
- Gir bare symptomene (ikke diagnose og medisin)
- Noen misforståelser på betydning av farger
- Feil ble «liggende» for lenge

«Versjon 2.0» - 2015-

- Ivaretar Ptil anbefalte inndeling
 - Barriefunksjon
 - Barriere element
 - Andre påvirkende faktorer
 - Ytelseskrav
- Kvartalsvis rapport fra TIMP som manuelt legges inn i BKPI
- Bow-tie visualisering
- Hensyntar resultatene fra BIR
- Justert statistisk grunnlag for status
- Forenkling
 - Visualisering
 - Vekting ut

Generelt

- Ytelseskrav riktige?
- Balansere historikk med dagens status
- Inkludere flere elementer (design, kompetanse, + +)
- Fin utvikling → økt fokus og læring -> får ting gjort

