



Risk management

as part of an asset
management process

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- Risk Management Cycle
- Business Values
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- Examples and reports
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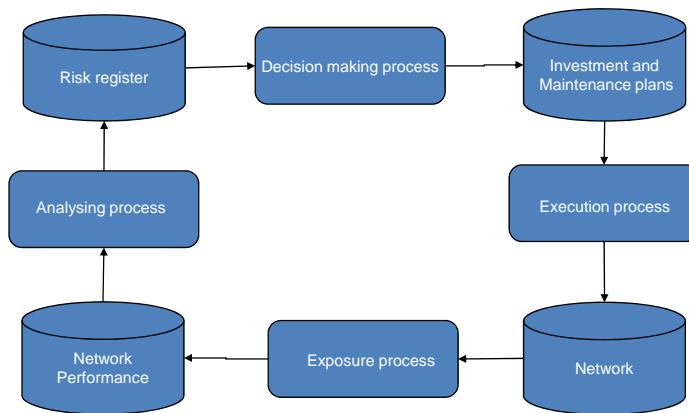


■ Electricity and gas
■ Electricity
■ Gas



Customers	electricity	2.8 million
	gas	2.1 million
Outage	electricity	24 minutes
	gas	21 seconds
Transported	electricity	32.950 GWh
	gas	6.232 million m3
Switches		450.000 #
Net turnover		€ 1.336 million

Asset management process

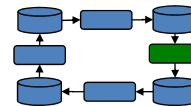




Execution process



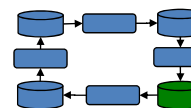
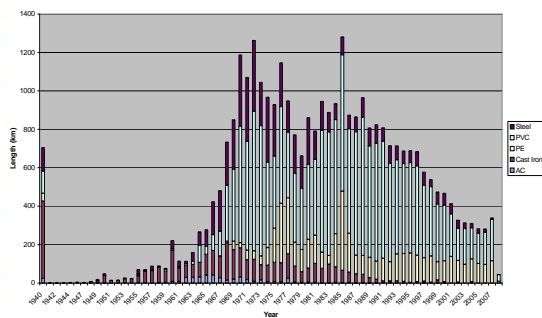
New mains	200 km	replacement 135 km
Service line	21.000 #	replacement 15.000 #
Maintenance regulator stations	5.000 #	
Leak survey	7.500 km	
Repairs	20.000 #	
Cathodic protection	13.000 measurements	



Network



Mains	36.000 km
High Pressure stations	17.500 #
Service lines	2,1 million #

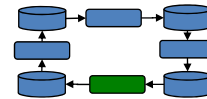




Exposure process



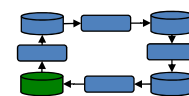
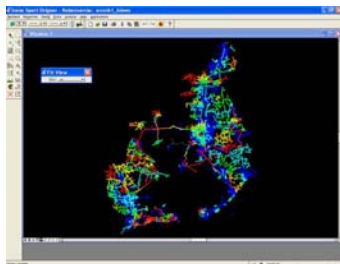
Digging, decline of surface
Ageing, corrosion
Operating failures
Grow in capacity



Network Performance

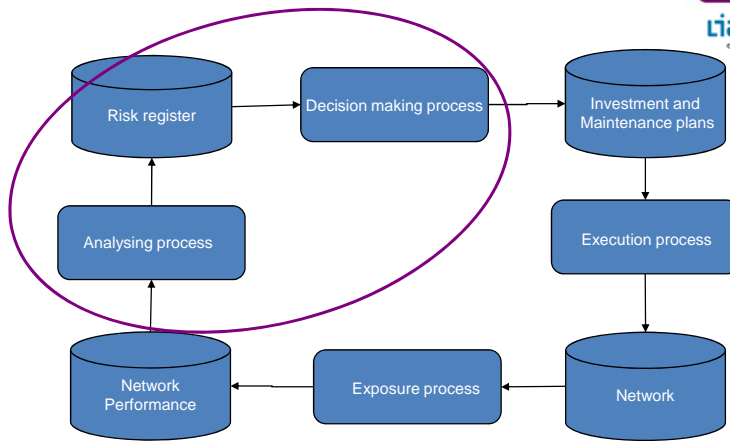


- Safety
 - # leakages
 - Safety indicator
- Quality of supply
 - Customers minutes lost
 - Capacity and pressure

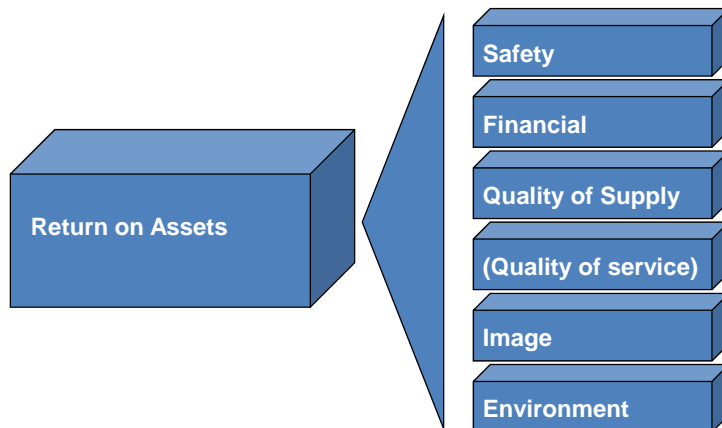




Asset management process



Business values





Risk Consequence Matrix (example) effect



Per incident	Financial "Damage"	Quality Customers minutes lost	Safety
Catastrophic	> 10M€	>10Mmin	several deaths
Severe	1-10M€	1-10 Mmin	1 death/heavy handicap
Serious	0,1-1M€	0,1-1 Mmin	1 disabled
Moderate	10-100 k€	10-100kMin	longlasting absenteeism
Small	<10k€	<10kMin	near accident, no or light injury



Risk Consequence Matrix (example) effect



Per incident	Image "attention in press"	Image "authorities"	Environment "clean-up-costs"
Catastrophic	> 1 month national	structural clashes	> 10M€
Severe	week national month regional	single conflict	1-10M€
Serious	TV-program, national artical, week regional	dozens of corrections	0,1-1M€
Moderate	regional article,complaint in newspaper	< 10 corrections	<100k€
Small	local news item	-	<10k€



Risk Evaluation Matrix

Risk = Probability x effect

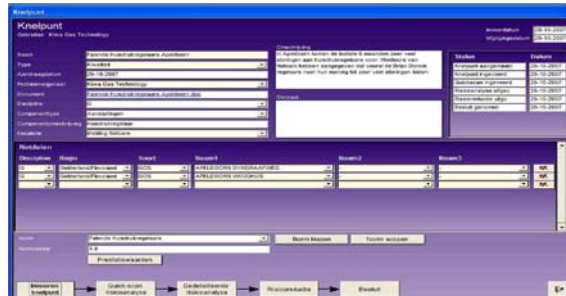


Probability/effect	# per year	Catastrophic	Severe	Serious	Moderate	Small
Permanent	>1000	VH	VH	VH	H	M
Daily	>100	VH	VH	H	M	L
Monthly	>10	VH	VH	H	M	L
Yearly	>1	VH	H	M	L	N
Frequently	>0,1	VH	H	M	L	N
Probable	>0,01	H	M	L	N	N
Possible	>0,001	H	M	L	N	N
Not likely	>0,0001	M	L	N	N	N
Almost impossible	>0,00001	L	L	N	N	N

VH Very high risk, immediate action
M Medium risk, attention for the coming years
N Negligible risk, can be neglected
H High risk, to be treated according normal procedure
L Low risk, can be put aside at this moment

Support tool

- Step by step
- Linked with internal and external norms
- Management reports



Input event

Quick scan

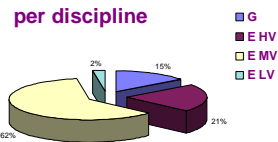
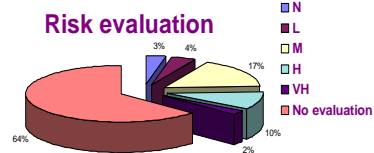
Detailed scan

Risk reduction

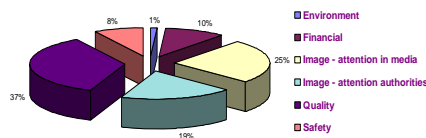
Decision



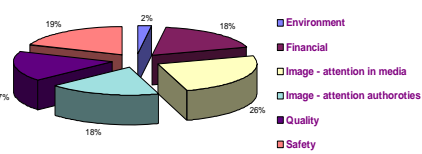
Reports



Business Values at risk E and G



Business values at risk Gas



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Conclusions

- Transparent
- Comparable and Clear for all employees
- Manageable
- Well founded arguments towards external parties

- Auditable (for example BSI PAS 55)

- Still under construction



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24th World Gas Conference
ARGENTINA | 2009
5-9 October

The Global Energy Challenge:
Reviewing the Strategies
for Natural Gas

Questions?



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