MANAGING RISK

DNV – Managing Risk

Environmental Risk Management

GIS based oil spill response operation tool

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DNV – an independent foundation

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"Safeguarding life, property, and the environment"

More than 140 years of managing risk

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- Det Norske Veritas (DNV) was established in 1864 in Norway
- The main scope of work was to identify, assess and manage risk – initially for maritime insurance companies

300 offices in 100 countries

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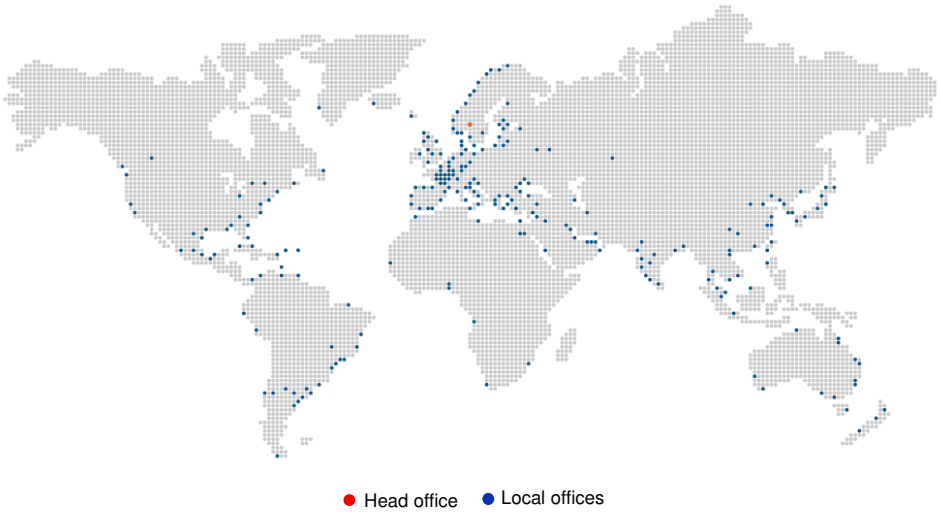

New risk reality

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- Nations, public authorities and ompanies today are operating in an increasingly more global, complex and demanding risk environment

- Society at large is gradually adopting a “zero tolerance” for failure
- Increased demands for transparency and business sustainability
- Stricter regulatory requirements

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Detailed Analysis and Planning

Classification of shorelines

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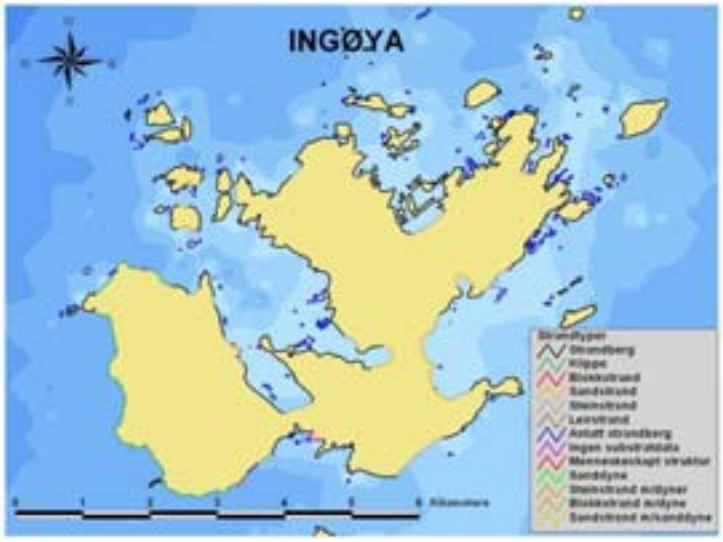

Planning process flow chart

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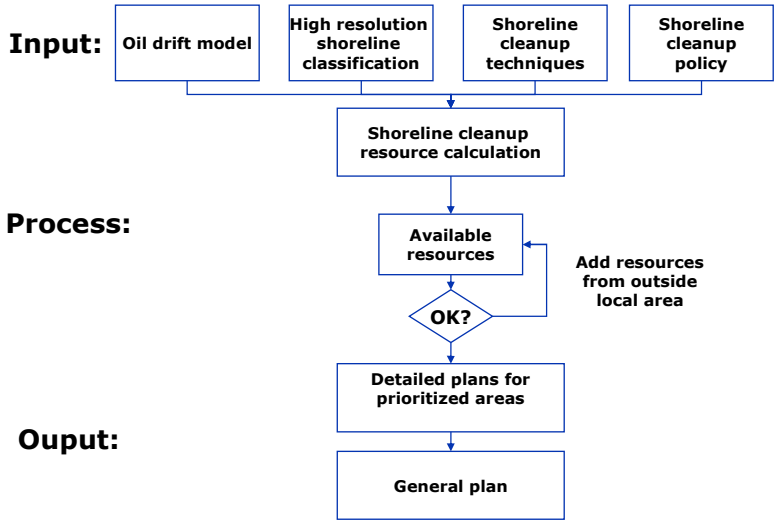

Services

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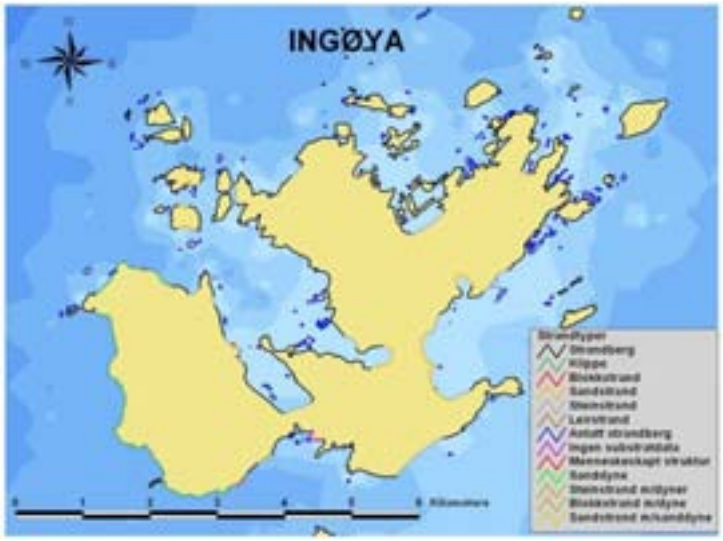
- Baseline survey and impact monitoring
- Oil drift modelling
- Resource and sensitivity mapping
- Environmental risk assessment
- Environmental impact assessment
- Environmental management systems
- Environmental information systems
- Pollution preparedness and response
- Remediation of soil and ground water
- Environmental Due Diligence Audit - EDDA
- Pollution modelling
- Inventory mapping
- Biodiversity Management
- SHE risk management
  (Safety, Health and Environment)
- Management of CSR
  (Corporate Social Responsibility)
- LCA (Life Cycle Assessment)

Classification of shorelines



Shoreline classification of Ingøy

Distribution of shoreline types:	Km:	% of total:
Rocky shores	99,6	83,8 %
Cliffs	7,5	6,3 %
Boulder shore	0,6	0,5 %
Sandy beach	3,9	3,3 %
Stony beach	4,9	4,1 %
Clay beach	0	0,0 %
No data	0,4	0,3 %
Manmade structures	1,9	1,6 %
Sum:	118,8	

Prioritization of shorelines

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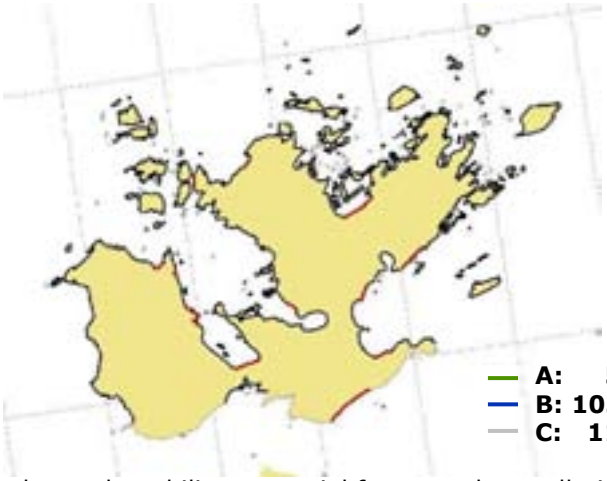

Based on vulnerability, potential for secondary pollution and overlap with environmentally sensitive areas

Dimensioning incidents

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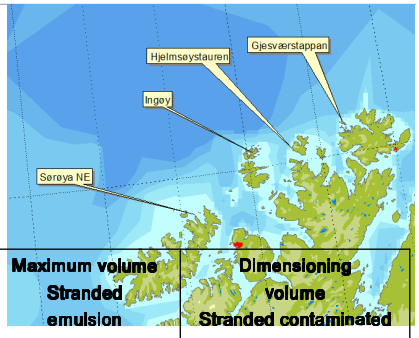
Results from the oil drift analysis:

- Dimensioning areas for detailed planning of contingency
  - High probability of oil exposure
  - High environmental sensitivity
  - A contingency challenge



Prioritized area:	Shortest drift time (hours)	Average drift time (hours)	Maximum volume Stranded emulsion (tons)	Dimensioning volume Stranded contaminated Mass (tons)
Sørøya Northwest	33-55	220-243	60	240
Ingøy	32-40	221	10	40
Hjelmsøystauren	53-57	241-258	1	4
Gjesværstappan	58	280	5	20

Estimates for cleanup operations

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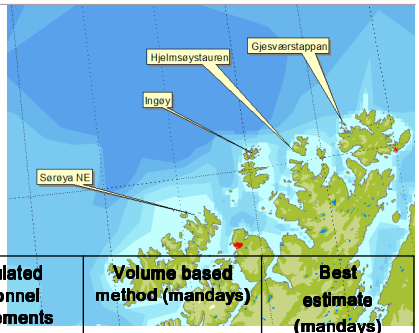
Based on previous experiences from cleanup operations following ship wrecking

- Oil amounts
- Type of shoreline
- Adjustments for arctic conditions



Prioritized area:	Dimensioning volume stranded emulsion (tons)	Calculated personnel requirements (mandays)	Volume based method (mandays)	Best estimate (mandays)
Sørøya Northwest	240	5.000	6.000	5.500
Ingøy	40	2.750	1.500	2.250
Hjelmsøystauren	4	400	200	300
Gjesværstappan	20	1.800	750	1.300

Action plan map for Ingøy

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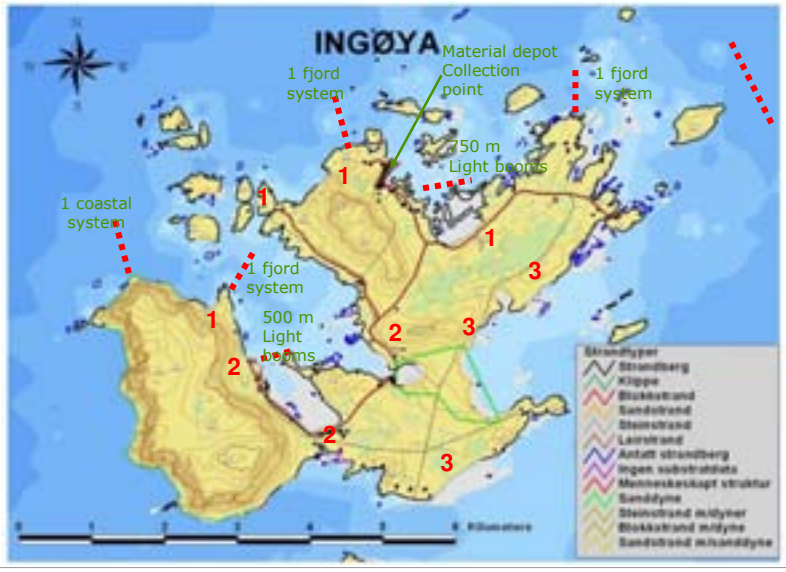

Incident specific web pages

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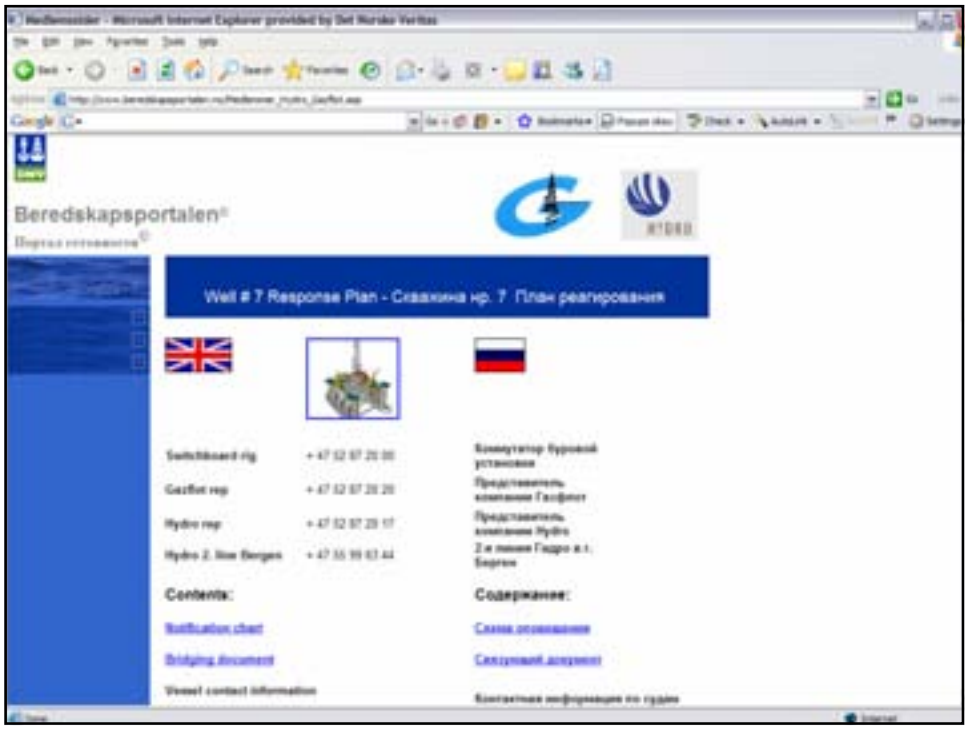
- Oil spill response plan – main document.
- Generic action and response plan for the area of influence.
- Detailed action and logistics plans for sites of high environmental sensitivity.
- Databases on available personnel, equipment and vessels.
- Templates for forms and checklists containing key information for the activity
  - Ordering oil drift simulations
  - Initial action plan with economic framework
  - Detailed action plans
  - Communication plan
  - Shoreline cleanup plan
  - Daily reports from on site group leaders
- Information flow



GIS tool in Operations Centre

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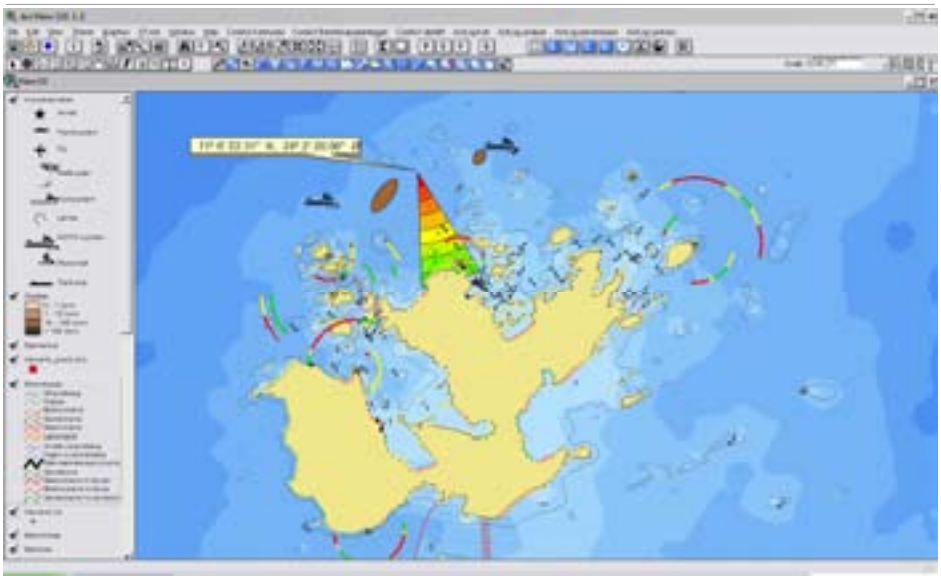

From Operations Centre to the www

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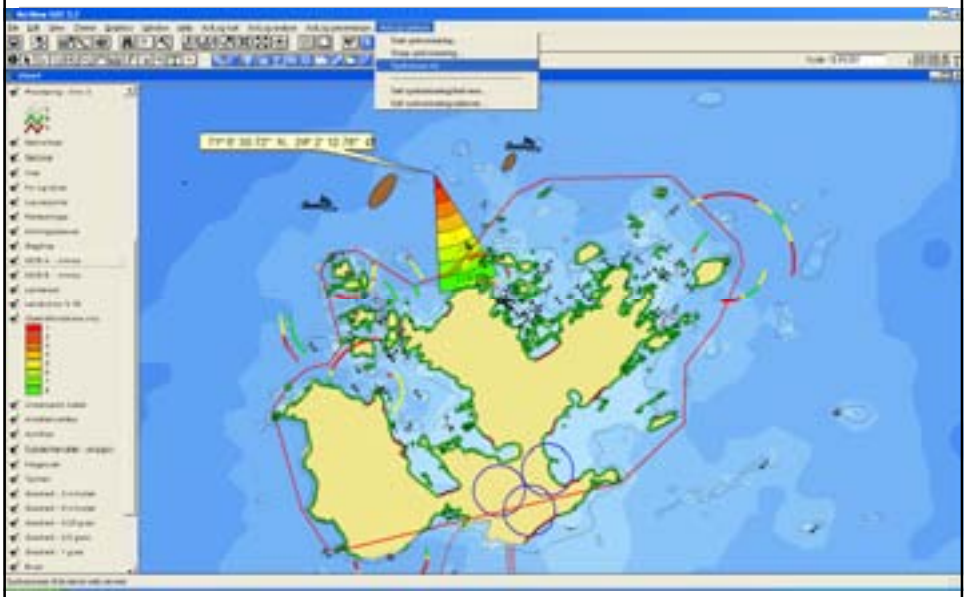

Incidents – information exported to the web

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- www.beredskapsportalen.no
- A specially set up internet portal
- Contains the information provided by the GIS in the operating room
- One web page providing all information on the status of the incident
  - Oil slicks
  - OR systems and resources deployed
  - Oil budget
  - Nature reserves and resources
  - Metocean data
  - Oil drift indicators
  - Log from all organisations involved
- Available for
  - Operator
  - Operation group
  - On-scene commanders
  - Authorities

Status on the www.beredskapsportalen.no

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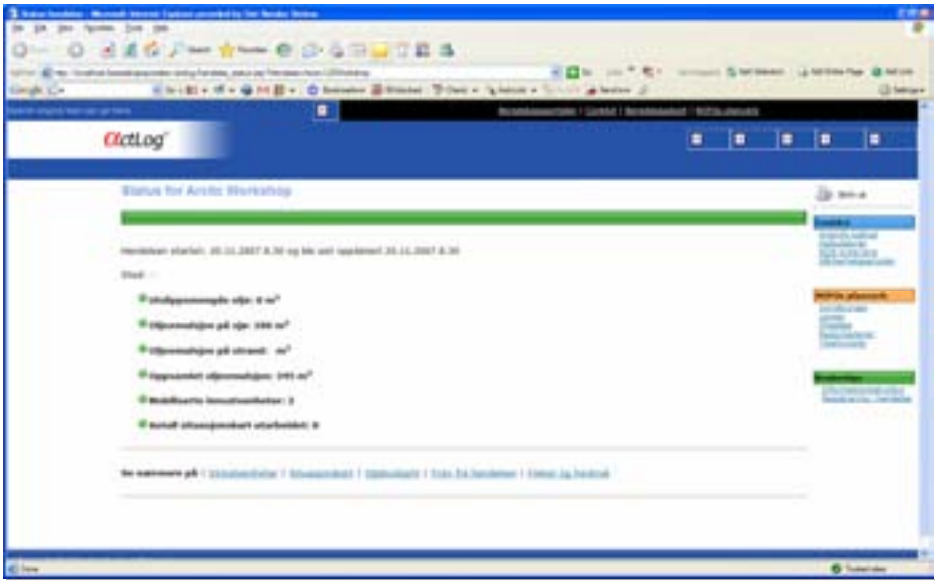
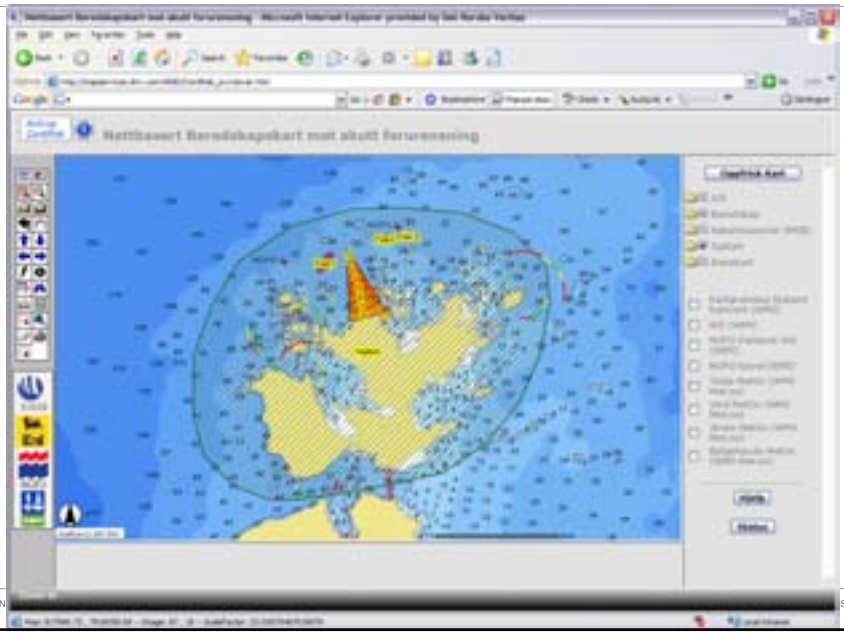
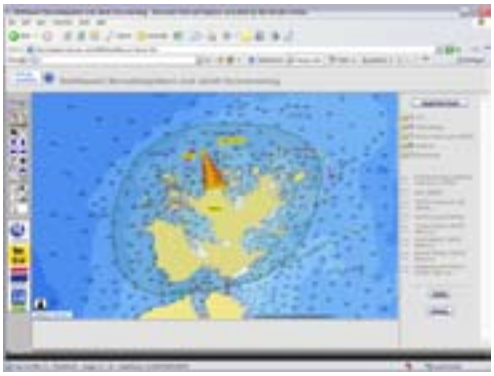


Interactive contingency map on the www



To conclude...

- The common situation map
  - Same information available at the same time
  - Detailed local information on the spill
  - Authorities can follow the situation
- Can provide all the status information in one place



Business Issue

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We offer a profound understanding of environmental issues both at a local, regional and global level.

We focus on providing risk-based decision support that targets the major risk drivers.

Value Proposition

MANAGING RISK

DnV provide tailor made solutions that enhance our customers environmental performance and reputation;
hereby adding value to their business

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www.dnv.com

Thanks for your kind attention……..

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