CSR

What makes an offshore oil & gas project ‘sustainable’?

In search of sustainability risk indicators for offshore oil & gas development projects

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Preface

This thesis is the final piece that had to be delivered for a successful completion of the Executive Program on Corporate Social Responsibility (CSR Management) at the Erasmus School of Accounting & Assurance, a partnership between the Erasmus School of Economics and the Erasmus University.

For this thesis I have carried out a research project within my own organization, Dana Petroleum Netherlands B.V., which started in March 2013 and ended in November 2013.

It has been a busy period and sometimes a real challenge to combine the activities for this research with my day-to-day job responsibilities. On the other hand, it gave me the opportunity to put a great deal of the theory from the class room into practice, which was a real valuable and learning experience.

All in all I have to say that I am very pleased with the final result and hope you will enjoy reading it.

Frank Boelsma
Amersfoort, 5 November 2013

Abbreviations

ALARP	:	*As Low As Reasonably Practicable*
CAPEX	:	*CApital Expenses*
CSR	:	*Corporate Social Responsibility*
IFC	:	*International Finance Corporation*
GRI	:	*Global Reporting Initiative*
HSEQ	:	*Health, Safety, Environment and Quality*
IMS	:	*Integrated Management System*
IPIECA	:	*International Petroleum Industry Environmental Conservation Association*
SRI	:	*Sustainability Risk Indicator*
NGO	:	*Non-Governmental Organization*
NOGEPA	:	*Netherlands Oil and Gas Exploration and Production Association*
OPEX	:	*OPerating Expenses*
PDM	:	*Project Delivery Model*

Table of Contents

1 Introduction

This first chapter introduces Dana Petroleum, the relevant processes it has in place as well as its ambitions. This leads up to the formulation of the objective of this research project.

1.1 Introduction to Dana Petroleum

Dana Petroleum Netherlands B.V. (Dana) is an oil and gas exploration & production company operating in the Netherlands. Dana is a Limited company (in Dutch: Besloten Vennootschap) located in The Hague, as a fully owned subsidiary of Dana Petroleum Plc, headquartered in Aberdeen, UK. Dana Petroleum Plc is owned by the Korea National Oil Corporation (KNOC), a state-run oil company carrying out energy projects on behalf of the Korean government. Dana Petroleum Plc, being an operating subsidiary, has its own identity and can operate (to a great extent) independently from its parent KNOC.

Dana and its predecessors have been present in the Netherlands as from 1964, having operated production on the Dutch Continental Shelf since 2001. Nowadays Dana operates two offshore production platforms and has interests in a number of operated and non-operated exploration and production licenses in the Netherlands.

1.2 Risk management

Risk management
A ‘risk’ associated with an event can be defined as the potential consequence of the event times the probability of occurrence, or: *Risk = Severity x Probability*.

Risks can lead to 'losses' or undesirable effects, e.g. on the safety or health of people, on the environment, it may lead to damage to the assets and (high) additional costs, or it may affect the company reputation.

If companies wanted to eliminate *all* risks of loss, costs would increase disproportionately. Risk management enables companies, given the limited resources available, to make the right decisions and apply the most appropriate control measures. Risk management increases the chance of success and reduces the risk of 'failure'.

Management of risk usually takes place at different levels in an organization; there may be an enterprise-wide approach to risk management, i.e. enterprise risk management, and/or a risk management focused more on the operational processes, operational risk management. For risk management to be fully successful, risks should be managed at all the levels in a company.

Dana risk management policy
Dana has a Risk Management Policy in place in which Dana’s guiding principles are mentioned (see Appendix A). The main principles in this policy document (2013) are:

- *Dana will consider business, social and environmental interests in its decision making processes;*
- *Dana will strive for continual improvement of its work practices and performance;*

- *Providing a safe and healthy work environment, in which occupational and process health and safety get equal attention;*
- *Creating a working environment in which employees and contractors work on an equal basis in respect of health and safety, promoting intrinsic good behaviour towards managing risks;*
- *Recognising and taking responsibility to minimize environmental aspects and impacts related to our operations;*
- *Maintaining the integrity of the facilities preventing accidents, damage and loss of production;*
- *Optimizing the facilities' reliability and efficiency resulting in a stable production and cash flow.*

The protection of people, the environment and the assets is key in Dana's policy. This is also reflected by the 'Zero Harm' philosophy as promoted by Management. According to the Zero Harm philosophy damage to people, environment and assets is foreseeable and therefore can be prevented or minimized.

Integrated Management System

For managing its business processes Dana uses an Integrated Management System (IMS). This management system is based on three international standards, i.e. ISO 14001 (for Environmental Management systems), OHSAS 18001 (for Safety Management systems) and PAS 55 (for Asset Management).

The three pillars of the IMS are:

1. *The Risk Management Policy of Dana*
   This policy document contains the guiding principles to be upheld in everything Dana does.
2. *The requirements set by legislation, but also by the 'corporate' organization and the various industry standards*
   Regulatory requirements will always prioritise over the other requirements. In case the regulatory requirements provide for a 'lower level of protection' than, for example, international industry standards do, the latter will be applied.
3. *The business-related risks*
   Dana has analysed all its business processes, sub-processes and activities, and has identified the responsible functions (RACI matrix). For each (sub-) process or activity the responsible functions have identified the main risks involved, including the necessary control measures. These may be technical, organizational or procedural measures, or may relate to supervision. Risks and associated control measures are reassessed and reviewed on a regular basis and changes are made if required (for example based on learnings from incidents).
   The fact that risk assessment is applied in all Dana's business processes makes the IMS a 'risk-based' management system.

Risk assessment methodologies

The methodologies Dana uses for risk assessment are very diverse and depend on the specific goal of its application. However, the general approach is always the same and is done in the following steps (see figure 1.1):

1) Risk identification:
   a. Hazards identification (what are the sources of risk)
   b. Identification of possible -undesired- effects (scenario development)

2) Risk analysis: Determine the size of the risk ('severity x probability')

3) Risk evaluation: Compare outcome with accepted criteria
Followed by:
4) Risk treatment (identify control measures and determine residual risks)
6) Monitoring and review

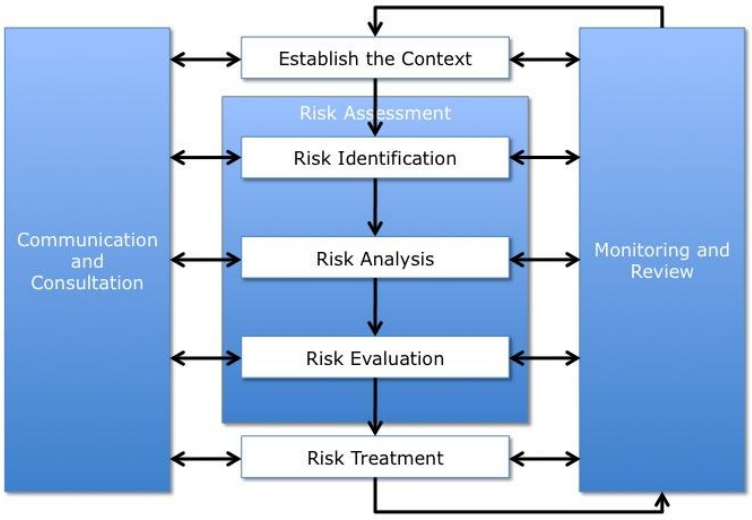

Figure 1.1: The risk management process (from: ISO 31000)

In case of a new project, the concerning Project Manager, assisted by the project HSEQ Adviser, is responsible for the coordination of risk assessments. On the initiative of the Project Manager or HSEQ Adviser one or more risk assessment team(s) will be composed to identify and assess the risks associated with the various business processes. The teams will be composed in such a way, that the following expertise is brought in:

- Knowledge of and experience with the concerning process(es) and/or installation(s)
- Management and organizational expertise
- HSE discipline expertise

Internal expertise will be provided by the concerning Department Managers. External expertise may also be brought in.

In order to determine the size of the risk, both quantitative and qualitative analytical methods can be used. The specific methods should be applied according to the level of detail required and the information available. Dana uses various methods, both quantitative and qualitative, although the (semi-) qualitative method using the 'risk matrix' is the most common. Figure 1.2 shows an example of a risk assessment matrix that is used by Dana to assess the risks in its business processes.

CONSEQUENCES					PROBABILITY OF OCCURRENCE				
					Probability level				
					1	*2*	*3*	*4*	*5*
Severity level	People	Assets	Environment	Reputation	Very Unlikely	Unlikely	Possible	Likely	Very Likely
					Never heard of in the E&P Industry	Has occurred in the E&P Industry	Incident occurs yearly in E&P Industry	Incident occurs yearly in Dutch E&P sector	Incident occurs more than once per year in Dutch E&P sector
5	Multiple fatalities	Extensive damage	Massive effect	International Impact				HIGH *Intolerable*	
4	Single fatality	Major Damage	Major Effect	National Impact			MEDIUM		
3	Major Health Effect / Injury	Local Damage	Localized Effect	Considerable Impact			*Incorporate Risk Reducing Measures to ALARP*		
2	Minor Health Effect / Injury	Minor Damage	Minor Effect	Limited Impact	LOW *Manage for Continuous Improvement*				
1	Slight Health Effect/ Injury	Slight Damage	Slight Effect	Slight Impact					
0	Zero Health Effect / Injury	Zero Damage	Zero Effect	Zero impact					

Figure 1.2: The Dana *Risk Assessment Matrix*

Dana has defined so-called *risk acceptance criteria* that reflect the extent in which risks are regarded as acceptable or not. The risk acceptance criteria are used as the baseline against which all risk assessments are performed by Dana.

A risk is usually categorized as 'low', 'medium' or 'high' (usually represented by the colours green, orange or yellow and red). Based on the risk, control measures are required (for red) or not (for green). In case of medium risk (orange/yellow) measures must be taken to reduce the risk *As Low As Reasonably Practicable* (ALARP). The overall objective of applying risk assessment is therefore to ensure that the risks in the business are reduced as much as possible (ALARP) and to also point the way for continual improvement.

Project Delivery Model

Dana applies risk assessment already in an early stage during the development of new projects. Reason for that is that in such early stages it is still possible to influence the design; risk control measures can thus be taken at the lowest cost.

According to the Dana Project Delivery Model (PDM, figure 1.3) Dana carries out a preliminary risk assessment already during the first phase of 'Opportunity Identification'. A risk assessment should then be done in more detail in the subsequent 'Concept Screening & Selection' phase of the proposed project.

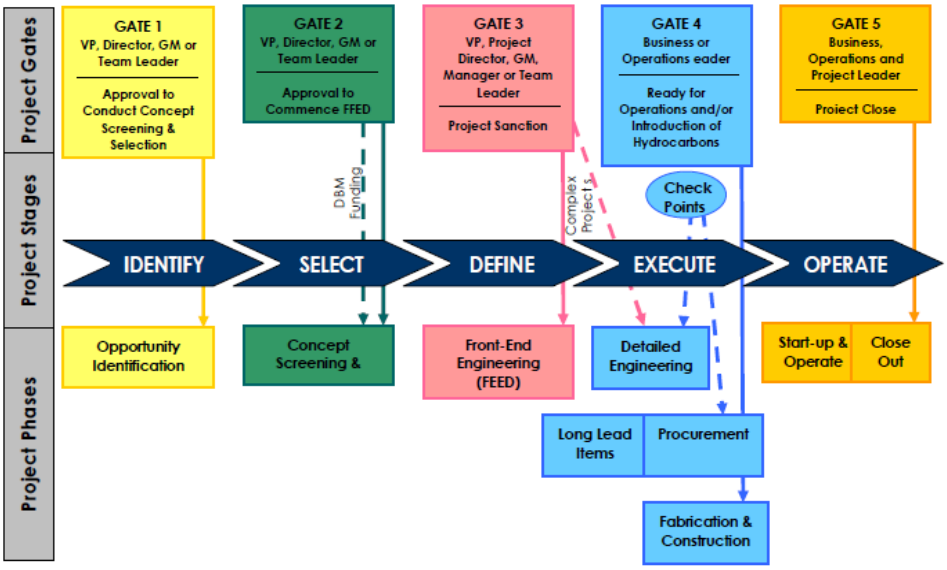

Figure 1.3: The Dana *Project Delivery Model*

References: (3), (4), (5), (6), (7), (8), (12), (13), (20), (28), (29), (30), (46)

1.3 Dana sustainability initiative

Sustainability framework
Dana defines 'Sustainable Development' as:
"*Developing an economically healthy business in a responsible way by maximising value for our stakeholders and for society at large and by minimising any adverse effects to the environment*".

Key to the concept of sustainability is striking the right balance between the social, environmental and economic dimensions. For Dana these dimensions have been defined as the care for people, minimal impact to the environment and (development and operation of) economic viable assets. The net result of the effect that the company has in these three dimensions, needs to be positive at all times and should improve in time.

This viewpoint of Dana is in line with the so called "Triple Bottom Line" thinking. According to the Triple Bottom Line, economic growth and social progress should go hand in hand with environmental stewardship (figure 1.4).

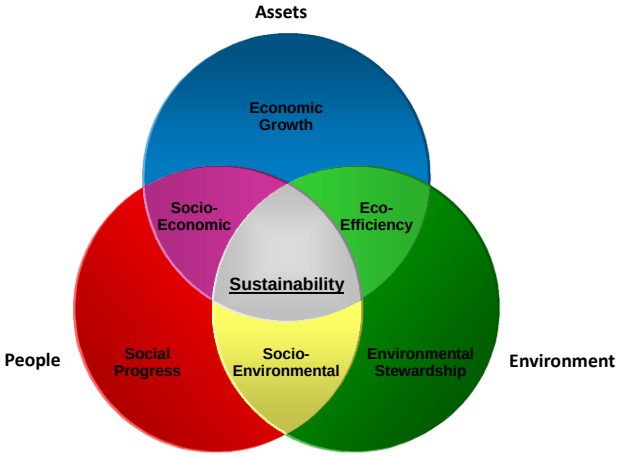

Figure 1.4: The Triple Bottom Line

'Corporate social responsibility' (CSR) is about the accountability a company takes for the impact of its decisions on the stakeholders and on the environment. CSR entails doing business in an ethical way, taking a pro-active attitude towards stakeholders and being transparent on business principles and performance, both internally and externally. In this sense, CSR can make a strong contribution to the sustainable development of the company, as stipulated by the Triple Bottom Line. Dana believes that adopting CSR in its management systems and business practices will eventually bring the company further.

For a socially responsible business, the stakeholders are the focal point, meaning that all those affected by the company should somehow be involved in the business process.

KNOC as the single 'shareholder' has business principles and core values for itself, which reflect their commitment to social responsibility and to sustainable development. Dana Petroleum, although being an independently operating subsidiary, recognises itself in the expectations set out by these principles and values.

Besides KNOC, Dana's other stakeholders consist of a variety of different groups like employees, contractors, authorities, customers, joint venture partners, interest groups, etc.

Rationale

The rationale for the Dana sustainability initiative is founded upon several company and corporate beliefs.

As already stated in section 1.2, the Risk Management Policy of Dana mentions fundamental business principles that reflect a drive for sustainable development:

- *Dana will ensure compliance with all relevant regulatory requirements and strives for meeting stakeholders' expectations whenever possible;*
- *Dana will ensure an ethical and transparent way of doing business, being a trustworthy business partner;*
- *Dana will consider business, social and environmental interests in its decision making processes, contributing to a more sustainable society;*

- *Dana will strive for continual improvement of its work practices and performance, maintaining a recognized top quartile position.*

Additionally, more specific commitments are mentioned in its policy for people, the environment and the assets. Dana believes that adhering to these principles is essential in order to achieve a sustainable development of its business.

The Dana Petroleum Group as a whole also has values that provide guidance for the businesses within the Group (2012):

- People
  We respect and trust each other, take accountability for our actions and work as a team to deliver great results.
- Performance
  We expect high levels of performance from the business, ourselves and each other.
- Environment
  We understand the environment and work to minimise the impact of our operations.
- Safety
  We place the highest standards of safety above everything else we do.
- Mutual advantage
  We aim to meet the needs of society through education, employment and enterprise.
- Integrity
  We are always professional, fair and honest, acting responsibly in everything we do.

As said earlier, KNOC has embraced sustainable management and social responsibility already since 2009 and considers it as 'key' to the corporate management and a goal of the business. This is instilled in its business principles and core values. Besides, KNOC is also committed to the UN Global Compact, a United Nations initiative to encourage businesses worldwide to adopt sustainable and socially responsible policies and to report on their implementation.

From the above it can be concluded that not only within Dana Petroleum Netherlands B.V., but in the Group as a whole, there is the intention to grow the business in a responsible and sustainable way.

References: (7), (11), (16)

1.4 Dana's growth ambitions

The Dana Petroleum Group as a whole, and Dana Petroleum Netherlands B.V. as part of the group, has the ambition to grow considerably in the coming years, to become 'a leading oil and gas company with operations in Europe, Africa and Middle East'. The goal is to grow, not only in terms of increasing turnover and reserves, but also to set an example in terms of doing socially responsible business.

To live up to the ambitions for growth, new projects will be executed at an increasing pace. Such projects can be extensions of existing installations or entirely new developments such as a production platform, subsea installation, with or without construction of new pipelines to transport the hydrocarbons. Typically, the Dana projects are realized in an offshore environment.

The future production of oil or gas on a specific offshore location can take place in various ways. For the selection of one, or more, of these alternatives, an integrated assessment of the project alternatives is desirable. Besides financial and economic motives other criteria must also be included. Ideally, only the most sustainable alternatives are considered for further development.

Taking sustainability criteria into account in an early stage of the project cycle (during the project identification and selection phase) could prevent high costs and delays for mitigating or corrective measures of the adverse effects in a later stage of the project.

At present, there are risk assessment tools available, but Dana does not have a methodology in place to make an *integrated* assessment in an early project phase with the aim of selecting the 'most sustainable' project option. This hampers a well-informed and objective decision by the Project Manager in the early stages of project identification and option selection.

1.5 Research objective and questions

Objective

The objective of this research project is to contribute to the development of an integrated assessment methodology, as described in the previous section. This will be done by selecting specific parameters that are indicative of or decisive in the 'sustainability potential' of a project alternative. By giving a value to each of these parameters or indicators and embedding it into the existing project evaluation, the most sustainable project option can be selected.

As a result, it will be possible to apply the identified 'sustainability indicators' in every new Dana project, which will save considerable time and add to the consistency of the selection and decision-making process.

Research questions

Based on the research objective, the following specific research questions were formulated:

1. What are, for Dana projects, the most significant issues regarding sustainability?
2. Which parameters or indicators affect the sustainability of projects done by Dana the most?
3. What methodology is most suitable for Dana, considering the processes and systems Dana currently has in place?

1.6 Report contents

After the introduction and research objective in this first chapter, chapter 2 describes the approach and the consecutive steps taken in this research project.

Chapter 3 presents the results of the research, followed by the conclusions and recommendations in chapter 4.

2 Research approach and methods

In order to answer the research questions mentioned in chapter 1, I have decided to divide the research in several consecutive steps, i.e.:

1. Determine suitable reference or guiding principles for sustainability
- **2**. Derive relevant and significant sustainability issues for Dana
  - **3**. Determine risk indicators or contributing factors for these issues
    - **4**. Select the most important indicators for 'typical' Dana projects
      - **5**. Determine a suitable methodology and potential instrument for implementation
        - **6**. Ensure integration in the Dana (project) management system

In the following sections, the different steps are elaborated in more detail.

2.1 Find a reference for sustainability

As mentioned in section 1.3 Dana chose to adopt the Triple Bottom Line approach of John Elkington for its sustainability framework. This means that for Dana it is important to rightly balance the social, environmental and economic effects of its business decisions.

To be able to come to a set of relevant issues that are significant for the 'sustainability' of Dana (projects), a suitable reference was needed. Such a reference should provide sufficient detailed guidance in order to derive applicable issues and, -preferably-, there should be some (international) support or agreement on its contents. The latter would ease the acceptance of the methodology within the company.

For this first step a literature search was done looking at the different international standards and initiatives related to sustainability and corporate responsibility.

The literature search was done using several keywords, both in Dutch and in English. These included (amongst others): sustainability initiative, - framework, - instrument, - principles, corporate responsibility, social -, CSR, business ethics, transparency, code of conduct, stewardship.
Besides this also websites were visited of organisations known to be involved in sustainable development and business, e.g.: CSR Europe, EBEN, EITI, GRI, IFC, ILO, IPIECA, MVO Nederland, OECD, UNEP, UN Global Compact, WBCSD.

The literature search resulted in a huge number of documents. Most were available via the internet, some were found in (company) library or were already in my possession. All documentation that turned out to be relevant for this research was included in the bibliography at the end of this report.

2.2 Assess issues for relevance and significance

Once the sustainability reference was known, the issues that 'constitute' a sustainable development within this reference, needed to be filtered on relevance and significance for the activities of Dana.

For this I have applied a systematic and comparative method, using the following consecutive questions.

For relevance:
- Is the issue directly related to the Dana activities?
- Is it directly related to the Dana supply chain or partners?

For significance:
- What is the extent of impact of the issue on the stakeholders and on sustainable development?
- What is the potential effect of taking action (or not taking action) on the issue?
- What is the level of stakeholder concern on the issue?
- What are the expectations of society regarding responsible behavior on the issue?

The answers to the different questions (expressed as a 'score'), were determined using expert judgment and input from interviews with several key persons in the organization (see next section). The scores given varied between 1 (=none), 2 (=some) and 3 (=extensive). The final significance was expressed as a percentage.

The decision was made to directly involve all internal stakeholders, as well as the interests of external stakeholders. The latter was done by an independent consultant.

Only the relevant and significant issues (having scores 50% or more) were taken to the next step.

2.3 Determine sustainability risk indicators

In this third step the aim was to focus on the sustainability issues that are significant for Dana and determine the factors that have a potential negative (or positive) influence on these issues.

To be able to do this, insight was required into the potential risks that are involved in the realization of new developments at Dana. This information was gained in three ways:

1. From internal documentation
An internal document search was done in order to make use of past experience. The risk-related documents of some of the major projects of Dana were identified and analysed. All elements that turned out to be (potential) risk indicators were selected.

The following documents have been reviewed (table 2.1).

Table 2.1: Reviewed project documents

Project	Document type
F2-A-Hanze	Safety & Health Document
F2-A-Hanze	Risk Inventory and Evaluation
P11-B-De Ruyter	Safety & Health Document
P11-B-De Ruyter	Risk Inventory and Evaluation
Medway	Project Risk Assessment
Medway	Economic Screening
Dana NL	Environmental Aspects Register

2. From interviews
In order to get input from some 'key' persons within the Dana organization, interviews were done. For this purpose interviews were more preferred than a questionnaire, because of the interactive nature of an interview; any questions could be easily resolved during the interview itself.

In my choice for certain interviewees I have tried to select those who are, in their position, often 'risk owner' and who will also benefit from the result of this research project. Because of the fact that sustainability requires an integrated approach, the interviewees were -by definition- people from different departments, each of them having extensive experience in the 'managing of risks' in the processes for which they are responsible. Interviews were done with representatives of the following departments:

- Production Operations and Projects
- Supply Chain Management
- Finance
- Business Planning & Economics
- Health, Safety & Environment and Quality
- Human Resources
- Managing Director

In preparing the interviews, a number of questions were developed upfront, in order to give structure to the interview. These were mainly 'open' questions, which should invite the interviewee to display any ideas or requirements as seen from their own perspective. During the interviews, where required, further clarification or more detailed information was obtained.
On average the duration of the interviews was kept limited to one and a half hours.

Appendix B includes summaries of the interviews that were done.

3. From industry (association)
To gather information on risk-defining elements that apply to Dana, I have also looked at checklists available within the Netherlands Oil and Gas Exploration and Production Association (NOGEPA), e.g. the NOGEPA Checklist *Gevaren Mijnbouwwerk*.

In addition, existing standards and guidelines, relevant to the oil and gas industry, were also searched for sustainability risk indicators. All the used documentation is included in the bibliography at the end of the report. Table 2.2 gives a list of the main standards and guidelines that were used.

Table 2.2: (Non exhaustive) list of relevant international standards and guidelines

Standard	Subject
GRI G3	Sustainability Reporting Guidelines v3.1
IFC	Environmental, Health and Safety guidelines for Offshore Oil and Gas Development IFC Performance Standards on Environmental and Social Sustainability
IPIECA	Oil and Gas Industry Guidance on Voluntary Sustainability Reporting Guide to Social Impact Assessment in the Oil and Gas Industry Guide to Operating in Areas of Conflict Voluntary Principles on Security and Human Rights
ISO 14001 and 14004	Environmental management systems
ISO 14031	Environmental performance evaluation
ISO 17776	Methods and techniques for identification of hazards and risk assessment for petroleum and natural gas industries (offshore production facilities)
ISO26000	Social responsibility
ISO 31000	Risk management
OHSAS 18001 and 18002	Occupational health and safety management systems
PAS 55	Asset management

2.4 Select the key indicators for Dana projects

Of all the sustainability 'risk indicators' as identified in step three, a further evaluation was done in order to select only the most important indicators for 'typical' Dana projects.

For this exercise information was used from the performed interviews.

It is acknowledged that these 'key' indicators may change, depending on the planned activities and on the localities. Still, many of the indicators will be applicable for most of the projects of Dana, because of the similarities in project activities and local circumstances.

For this step the sustainability risk indicators were put on a scale reflecting the potential risk, the relevance for typical Dana projects, and the effect it will most likely have on the option selection. This is illustrated in figure 2.1. The indicators within the highlighted segment were identified as potential *Key* Sustainability Risk Indicators.

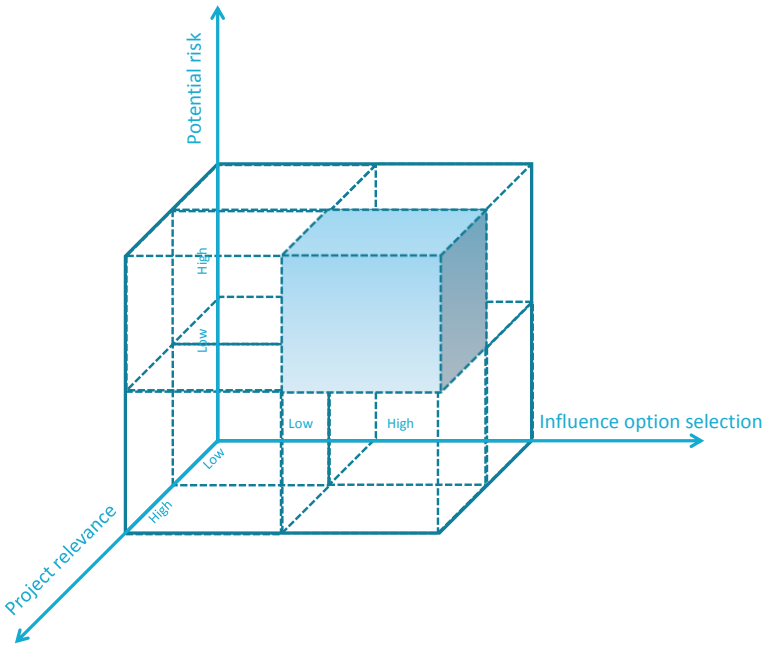

Figure 2.1: Selection of Key Sustainability Risk Indicators

2.5 Search for a suitable methodology and tool

Once the key sustainability risk indicators were known, a methodology was needed to be able to use these indicators to do a screening of potential project options and to select the most sustainable project option for Dana. The methodology should make use of, or be in line with, the existing systems of Dana. This would also improve the 'acceptance' of the methodology.

Literature search
In order to select a methodology that is suitable for this purpose and that is consistent with the current processes and systems that are already used by Dana, I did a review of current literature, which was available 'in house' and on the internet.

Literature was searched using various keywords, again both in Dutch and in English. These keywords included the following terms (not exhaustive): risk assessment, risk, operational risk, multi-criteria analysis, assessment methodology, decision support, project design, cost, ALARP.
General keywords were used in order not to miss potentially valuable information.

The literature search generated much information; most of it readily available on the internet. After screening, several useful documents remained. All literature that was useful is included in the bibliography in this report.

In addition to the literature search, I did enquiries using telephone or e-mail at several companies within the Dutch oil and gas industry and chemical industry.

I have approached the following companies:

- Wintershall Noordzee B.V.
- Chevron Exploration and Production Netherlands B.V.
- Nederlandse Aardolie Maatschappij B.V.
- AkzoNobel
- BASF

Testing and validation
The suitability of the methodology that I selected, following the above steps, was tested to determine whether the methodology met the criteria of Dana and the needs of the various stakeholders within the company.

On the basis of the information from the previous steps, a first draft of a decision support tool was built using Microsoft Excel.

The methodology and instrument was then tested and validated in a workshop with a group of experts. In the workshop, the methodology with the selected key sustainability risk indicators was applied to a fictitious project through the completion of a case study.

The advantage of a workshop is that it provides the ability to give and get feedback in an interactive way. In addition, the workshop provided a way for exchanging ideas regarding the design and functionality of the tool. The feedback from the workshop was used to adjust the list of key sustainability risk indicators and to give further shape to the methodology and tool.

Representatives of various departments participated in the workshop. Appendix C includes a description of the process steps that were taken during the workshop. This work flow will be applicable for future assessments as well.

2.6 Ensure integration in Dana management system

The Dana Integrated Management System (IMS) contains documents that prescribe how activities must be done, e.g. procedures, specifications, work instructions, manuals, forms etc.

In order to ensure that the new methodology will actually be used in future new projects, it needs to be integrated in the management system of Dana. As part of this step, I have determined which prescriptive document is most appropriate for this purpose.

The actual implementation is outside the scope of this thesis.

3 Research results

This chapter summarises the results of the research project. The first section aims to give an answer to the first of the research questions mentioned in section 1.5. The next two sections give answers to the other two questions posed at the start of the research.

3.1 Significant sustainability subjects and issues

This paragraph aims to answer the first research question, i.e. “what are, for Dana projects, the most significant issues regarding sustainability?”. The answer to this question is the result of steps 1 and 2, described in chapter 2.

3.1.1 ISO 26000 – sustainability issues

The literature search generated several possible references or ‘guiding principles’ for sustainability. Some of these are targeting specific areas like Human Rights or the Environment, others were more comprehensive in their approach.

Of all different guidances, the ISO 26000 ‘Guidance on social responsibility’ was selected to be used as reference for this project.

The ISO 26000 guidance document is the result of a multi-stakeholder project involving more than 90 states and 40 international and regional organizations. It takes account of both the ILO conventions and UN guidelines. Although this adds to its credibility, the consequence is also that the guidance is rather general sometimes and that more ‘politically controversial’ subjects were not (fully) included or less stringent.

The ISO 26000 is not a standard as such that can be used for certification, but it does include the requirements laid down in ISO 14001 for Environmental management systems and OHSAS 18001 for Occupational health and safety. The latter two standards are well known to the Dana organization; in fact the Dana integrated management system is (together with PAS 55) founded on these standards. This will certainly contribute to its acceptance and integration within the Dana organization later on.

ISO 26000 provides a suitable foundation for assessing the current state of ‘sustainability performance’, because it gives descriptions of what can be expected of organizations when dealing with the various sustainability subjects and issues.

Compared to one of the other useful references that were studied, the ‘IFC Performance Standards on Environmental and Social Sustainability’, the ISO 26000 offers less guidance on some of the sustainability issues. The IFC Performance Standards, for example, offer more guidance on community issues and issues related to indigenous people. ISO 26000 however gives more direction when dealing with corruption or unethical business practices, which seem to be more relevant for Dana’s current business environment.

Although other references could be used for the purpose of this project as well, ISO 26000 currently seems to offer a suitable starting point to determine relevant and significant sustainability issues for Dana.

The ISO 26000 provides guidance on 7 so-called core subjects of social responsibility, i.e.:

1. Organizational governance
2. Human rights
3. Labour practices
4. The environment
5. Fair operating practices / ethical business
6. Consumer (or customer) issues
7. Community involvement and development

The core subjects are further detailed into 37 issues that give more tangible guidance on the relevant topics to be addressed. Many of these 37 issues are also covered by either ISO 14001, OHSAS 18001, or PAS 55. However ISO 26000 is broader in scope, also addressing human rights and ethical ways of doing business, valuing stakeholder dialogue and engagement.

Because ISO 26000 is meant to be used by all kinds of organizations, being private, public or non-profit, it does not specifically address issues like a company's assets or its profitability, although it does mention the issue of 'wealth and income creation', as part of the core subject 'community involvement and development'.

The guidance is not limited to a company or organization itself; ISO 26000 introduces the term 'sphere of influence', where the company can (and should) make a difference, e.g. when dealing with business partners or with suppliers and contractors.

Figure 3.1 gives a schematic overview of the ISO 26000 scope.

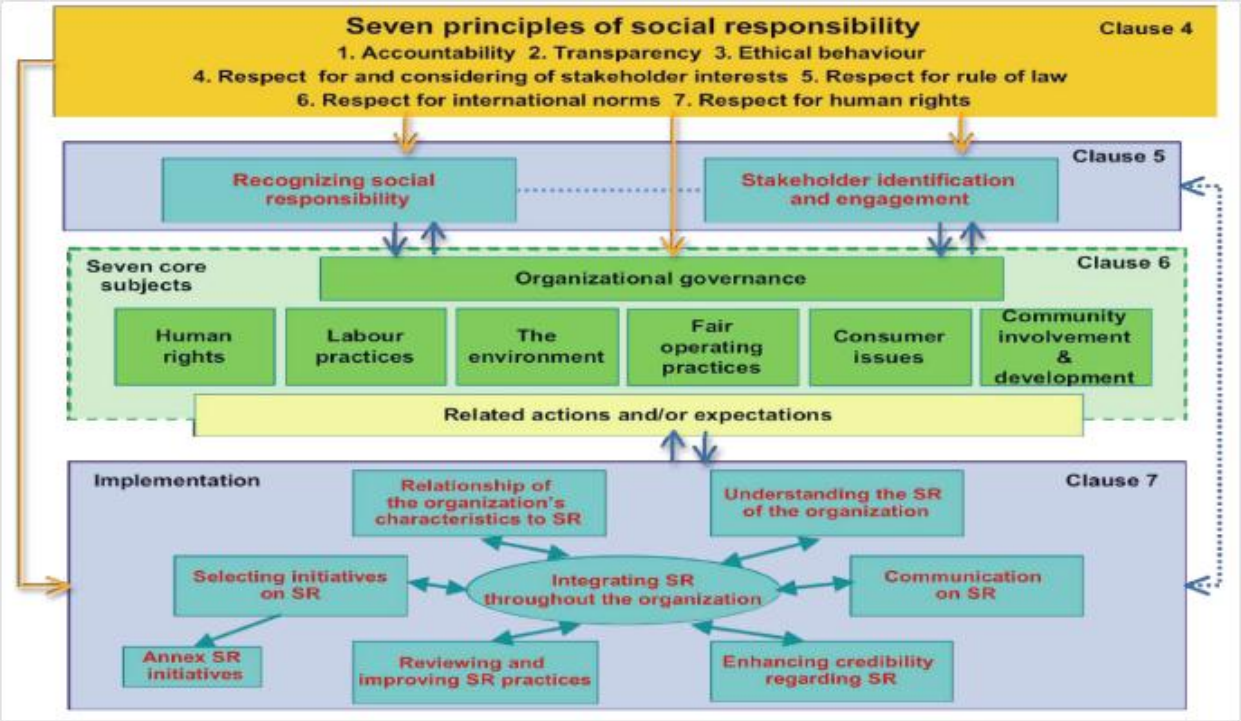

Figure 3.1: ISO 26000 schematic overview (from: ISO 26000)

3.1.2 Relevance and significance assessment

In order to determine which of the 7 subjects and 37 issues mentioned in ISO 26000 are actually relevant and significant for Dana, the questions were asked as stated in section 2.2 for each of these issues. The *relevance* of an issue is based on the activities of Dana and its supply chain, both in normal and in exceptional situations. The *significance* score includes the stakeholders' expectations and the possible impact when (not) taking action on the issue. The scores given varied between 1 (=none), 2 (=some) and 3 (=extensive). The final significance was expressed as a percentage.

The overview of the assessment, showing the scores for each issue, is included in Appendix D.

Table 3.1 gives the consolidated significance scores for the 7 core subjects.

Table 3.1: Consolidated significance scores (for ISO 26000 core subjects)

ISO 26000 core subject	Significance score (%)
1. Organizational governance	83,00
2. Human rights	75,00
3. Labour practices	83,00
4. Environment	79,25
5. Fair operating practices	66,60
6. Consumer or customer issues	43,86
7. Community involvement and development	52,29

The above table shows the highest scores for Organizational governance and for Labour practices (both 83%), closely followed by the concern for the Environment. The lowest (consolidated) scores are for Consumer issues and Community involvement, which can be explained by the fact that Dana finds itself mostly in a business-to-business environment with (still) limited exposure to the broader public. This is enhanced by the fact that Dana has only offshore operations and no communities were impacted as yet.

The subject of Organizational governance (the system used by the organization to take decisions and implement those in order to reach its objectives) is in fact a prerequisite that a company must have in place to be able to improve (and monitor) its performance with regard to the other six core sustainability subjects. This overarching element will, for the sake of this research, be regarded as a 'given'. In section 3.3 the integration of the research results in the Dana management system will be briefly discussed.

It must be emphasized that the significance scores reflect the current situation, i.e. what is currently perceived as being significant or not. These scores may very well change when the type of activities or business environment changes.

All the significant subjects were taken to the next step; to determine so-called risk indicators for the applicable issues.

References: (2), (14), (18), (19), (31)

3.2 Key sustainability risk indicators

This paragraph aims to answer the second research question, i.e. "which parameters or indicators affect the sustainability of projects done by Dana the most?". The answer to this question is the result of steps 3 and 4 of the research project, as described in chapter 2.

3.2.1 Risk recipients

As described in section 1.3, Dana has adopted the Triple Bottom Line approach of John Elkington as its sustainability framework. The *People, Planet, Profit* in this approach were 'translated' by Dana to *People* (referring to health & safety on the workplace and communities), *Environment* (environmental issues, including biodiversity), *Asset* (technical & operational integrity, process safety) and *Reputation* (ethical, political and legal issues). For practical reasons, and for reasons of this research objective, I have introduced *Budget* as the pure financial-economic and commercial element, which also includes for example a time element (start-up time, production life, project delays etc). All these 5 categories can be regarded as 'risk recipients'; these five groups are all 'sensitive' to various risks.

The significant subjects and issues identified in the previous section can be related to one of these risk recipients, as shown in table 3.2.

Table 3.2: Relation risk recipients and ISO 26000 sustainability issues

Risk recipient	ISO 26000 core subject	Sustainability issues
People (occupational health and safety, communities)	Labor practices	• Employment and employment relations • Conditions of work and social protection • Social dialogue • Health and safety at work • Human development and training in the workplace
	Community involvement and development	• Community involvement • Employment creation and skills development
Environment (environment, biodiversity)	Environment	• Prevention of pollution • Sustainable resource use • Climate change mitigation and adaptation • Protection of the environment, biodiversity and restoration of natural habitats
Asset (technical and operational integrity)	Community involvement and development	• Wealth and income creation • Technology development and access to technology
Reputation (ethical, political, legal)	Human rights	• Due diligence • Human rights risk situations • Avoidance of complicity • Resolving grievances • Discrimination and vulnerable groups • Civil and political rights • Economic, social and cultural rights • Fundamental rights at work
	Fair operating practices / ethical business	• Anti-corruption • Responsible political involvement • Fair competition • Respect for property rights
Budget (financial, commercial)	Relates to all subjects / issues	

3.2.2 Key sustainability risk indicators

As described in section 2.3, sustainability risk indicators for Dana have been derived from different sources of information. Of all these potential risk indicators (approximately 70 in total) some were more qualitative and others more quantitative by nature.

To be able to select only the 'key' sustainability risk indicators (and keep the total number of indicators manageable), the indicators had to be:

a) Relevant for all, or at least most of, the typical Dana projects
b) Indicative of a potentially high sustainability risk

c) Important or preferably decisive in selecting project options

The sustainability risk indicators were therefore scaled as illustrated in figure 2.1. Appendix F gives an overview of the sustainability risk indicators that were assessed.

The total number of Key Sustainability Risk Indicators or K-SRI's to be selected also depends on the intended application; they should be sufficiently numerous to actually provide a representative sample of the total risk to the sustainability of the project. On the other hand, the number should not be too large in order to keep the methodology workable and transparent. In first instance it was decided to select around 30 K-SRI's in total, as this seems to be a reasonable number to assess within 1 hour (a project with an average number of 5-8 options would then be completed in one day time).

Figure 3.2 gives an overview of the selected K-SRI's, divided over the identified 'risk recipients' People, Environment, Asset, Reputation and Budget. Each of the K-SRI's is indicative of a potentially high sustainability risk, specifically for the risk recipient concerned. Of course, other possible risks indicators are conceivable, but these are considered less risky, are not relevant for new developments or projects, or will not influence the choice between different project options.

It must be noted that the type and the number of K-SRI's can (will) change in case a project is done in a different environment (e.g. onshore instead of offshore) or if the nature of the project itself changes considerably. Depending on the situation, K-SRI's may be added or deleted.

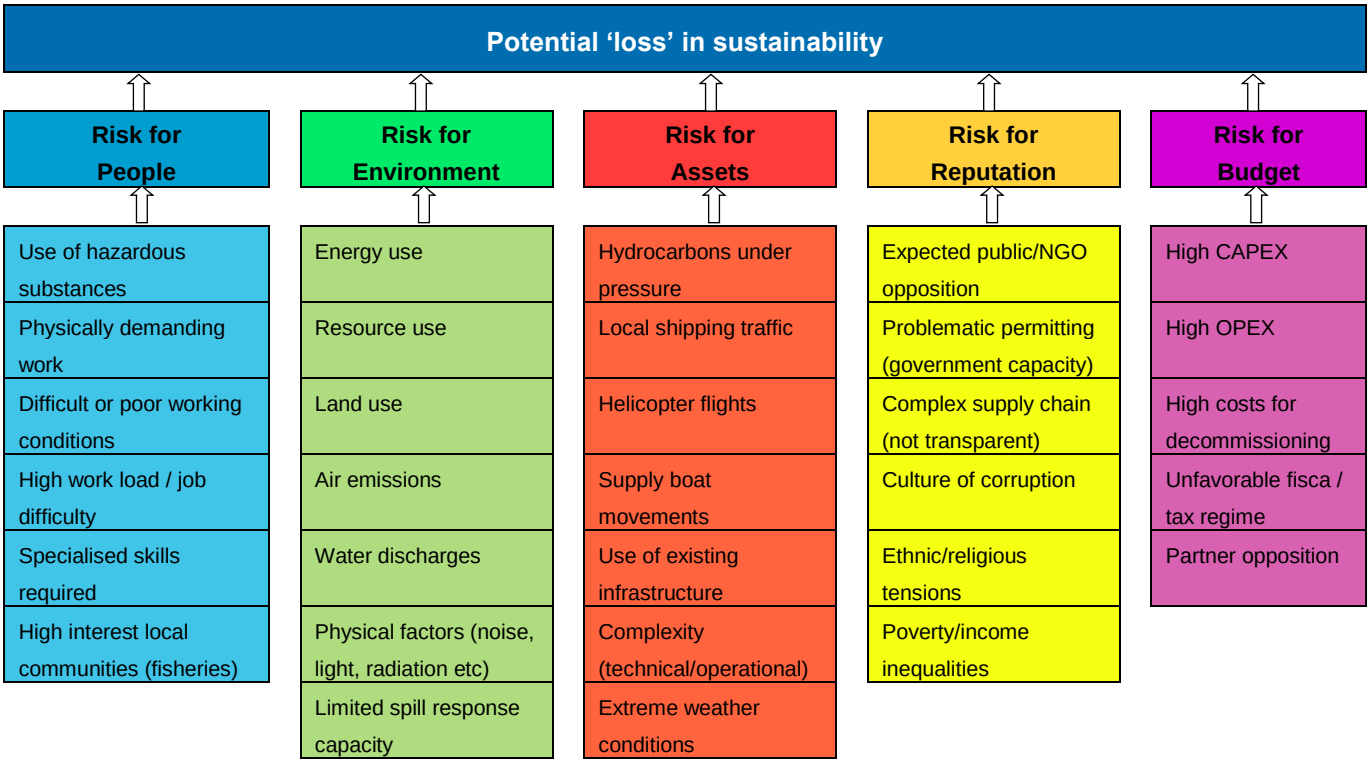

Figure 3.2: Overview K-SRI's per risk recipient

Appendix E includes a further clarification of the selected K-SRI's.

References: : (1), (6), (9), (10), (15), (17), (23), (25),(24), (26), (29), (32), (33), (34), (35), (37), (38), (39), (42), (43), (44), (45), (47), (48), (49)

3.3 Screening methodology and tool

This paragraph aims to answer the third and last research question, i.e. "what methodology is most suitable for Dana, considering the processes and systems Dana currently has in place?". In order to answer this question, steps 5 and 6 were taken.

3.3.1 Methodology

Existing methodologies
For finding a methodology that is suitable for Dana, or to generate ideas for such a method, a literature study was conducted on the internet. The study showed that methods for identifying and controlling risks as such are widespread, especially in the process industry, including the oil and gas industry. Also in other sectors, for example in the financial sector, assessment of operational risks plays an increasingly important role. The use of various assessment methods, so-called multi-criteria analysis methods, is quite common.

However, for the specific anticipated use for Dana, as formulated in section 1.4 and 1.5 of this report, no 'off-the-shelf' method or tool was found that meets all the criteria as formulated by Dana.
The literature study did generate several useful ideas for a Dana specific methodology, as will be described in the following section.

Description selected methodology
A methodology that is suitable for the intended application at Dana (i.e. to support management in deciding which of the project options are most sustainable) had to meet specific criteria. These criteria were formulated on the basis of discussions with the (internal) stakeholders.

The methodology had to be:

- Simple and easy to use
- Suitable to use in an early stage of project development, when only little data is available
- Transparent and deliver clear results
- In line with existing processes and systems

An assessment methodology that appears to meet these criteria is based on the comparison of the 'total sustainability risk' of a project option, using so-called 'sustainability risk profiles'. Each of these risk profiles is composed of five basic impact types, being People, Environment, Asset, Reputation and Budget (the financial-economic risk). These are the five so-called 'risk recipients', as mentioned in section 3.2. The Key Sustainability Risk Indicators (K-SRI's) given in section 3.2 determine the risk for each recipient. The K-SRI's can be regarded as the 'hazards' that may affect the respective risk recipients. A K-

SRI that is abundantly present is an indication that the risk recipient, and thus potentially the sustainability as a whole, is 'at risk'.

A K-SRI can be defined as a "simple indicator that provides the Project Manager with an early insight into the nature and size of a particular risk to the sustainability of a project option, for the benefit of effective decision-making and risk management".

Determining sustainability risk values
To be able to determine the risk value for each K-SRI, the size of the potential impact, or the 'sensitivity' of the risk recipient, must be established. After that the potential exposure must be determined, i.e. the abundance or ‘intensity’ of the K-SRI concerned.

For determining the sensitivity of the risk recipient and the intensity of the K-SRI, the following values can be applied (table 3.3).

Table 3.3: Values for sensitivity of the risk recipient and intensity of the K-SRI

Value	Sensitivity of risk recipient	Intensity of K-SRI
1	Not sensitive	Marginal
2	Little sensitive	Limited
3	Moderately sensitive	Average
4	Sensitive	Considerable
5	Very sensitive	High

Appendix G contains more clarification to help determining the sensitivity and intensity. In practice, the values of sensitivity and intensity are determined by consensus in a group of experts (expert judgment).

By multiplying the 'sensitivity' with the 'intensity' a value is obtained (minimum 1 - maximum 25), which reflects the size of the risk to the risk recipient, associated with the relevant K-SRI, or:

Risk value = Sensitivity Risk recipient x Intensity K-SRI

Each risk value can be colour coded; green for low risk, orange for a medium risk and red for a high risk (see figure 3.3). If a choice is made for a certain project option, special attention should be paid to potential measures for any K-SRI's in red or orange.

← Sensitivity risk recipient	Intensity K-SRI →					
		1	2	3	4	5
	1	1	2	3	4	5
	2	2	4	6	8	10
	3	3	6	9	12	15
	4	4	8	12	16	20
	5	5	10	15	20	25

Low risk value. Popably no specific control measures are required.

Value higher than average, which indicates a greater risk. Needs to be assessed if measures are required.

Increased value; a significant risk is possible. Control measures are required.

Figure 3.3: Matrix to determine the risk value

The overall sustainability risk score for each risk recipient is calculated by dividing the sum of all risk values by the number of K-SRI's. The sum of all the risk scores of the five risk recipients then gives the total sustainability risk profile of the project option concerned.

If required, weight factors can be attributed to the different risk recipients for a greater relative importance. This will only be necessary if more differentiation is needed in for example locations and/or phases of the project.

The sustainability risk profile of a project option clearly illustrates the relative risk for each of the risk recipients. The size of the profile itself is an indication of the sustainability risk of the project option as a whole. The project option with the smallest risk profile has the highest sustainability 'potential' and is thus preferred over the other project options.

N.B. A new project or new installation goes through different stages of a life-cycle, from design and construction to decommissioning. In this methodology I have decided to only focus on the sustainability risk for the production phase of a project. If desired, the construction phase and decommissioning phase could be assessed as well, but then a separate assessment should be done for these phases.

References: (1), (5), (8), (15), (20), (22), (23), (26), (36), (40), (41)

3.3.2 Decision support tool

In order to make the methodology easy to use, I decided to use Microsoft Excel for making a first draft tool. A widely used program as Excel has several advantages; no external expertise is required, the tool will be easy to use and it offers the necessary transparency. When the support tool has its final shape, it will be made more robust and less vulnerable for "unauthorised" changes to the functionality (more 'fool-proof'). For this, another type of software package will probably be more suitable.

The (draft) Excel tool has clear input screens for each project option; scores can be assigned to each K-

SRI (minimum of 1 to a maximum of 5). The K-SRI's are divided into five groups, corresponding to the individual risk recipients (People, Environment, Asset, Reputation and Budget). In addition a value can be assigned to the 'sensitivity' of the risk recipient (also with a minimum value of 1 to a maximum of 5). A weighting factor can be assigned to each risk recipient per project option.

On the basis of the input, risk scores are automatically calculated for each risk recipient and project option. On a separate tab in the Excel sheet, the resulting sustainability risk profile is displayed for each project option as a pentagon. The axes of the pentagon show the scores for the five risk recipients. The sustainability risk profiles can be shown separately and also combined in one graph.

Based on the input that was provided during the workshop, a few improvements of the instrument were introduced, e.g. a brief explanation of each K-SRI and the possibility to add additional K-SRI's in specific cases. Also the suggestion was made to work with dropdown menus in order to make it easier to complete different fields in the sheet.

Appendix C summarises the different steps that were taken during the workshop. This process flow can be used for future assessment meetings. Appendix H shows some 'screenshots' of the Excel input and output screens of the draft tool.

The rough version of the decision support tool will be further tested and will be developed into a more advanced instrument. This falls outside the scope of this thesis.

3.3.3 Integration in management system

The methodology will be included in the Dana Petroleum Risk Assessment Guideline, which prescribes the methodologies that shall be used for risk assessment, and when to apply them. This procedural document is made available via the Integrated Management System (IMS).

To make sure that the methodology and tool is applied as it should and in the most appropriate project phase, skilled people are required, both on management level and further down the line.
Besides having the right skills, people also need to become 'owner' of the process, especially the various Department Managers and those involved in project development.

Training sessions will be organized to develop both the necessary skills and to increase awareness and ownership.

Specifically for projects Dana has several prescriptive documents in place. All these are part of the Dana Project Delivery Model (PDM), which gives all required deliverables that must be in place in order to pass the subsequent gates in the model. Because application of the developed methodology will be most effective in the Concept screening and selection phase of a project, the use of the methodology will be incorporated in the PDM, as a mandatory requirement to pass gate 1 or 2.

As the methodology is used more often in future projects, more experience is gained. All the learning points coming from these projects will be collected and will be used for further improvement. Also the involvement of more and other external stakeholders will generate valuable input.

4 Conclusions and recommendations

4.1 Summary and Conclusions

This research project was done with the objective to contribute to the development of an integrated assessment methodology, which can be used to compare different project options on their sustainability potential, in a quick and easy way. There is a need to apply such a method during the 'opportunity identification' and 'concept screening & selection' phase of a new project.

One of the research questions posed at the start of the project was: "*What are, for Dana projects, the most significant issues regarding sustainability*?"
After selecting ISO 26000 as the reference for sustainability, an assessment was done, which resulted in an overview of issues that are relevant and significant for Dana's current or foreseeable business environment.

A second research question was: "*Which parameters or indicators affect the sustainability of projects done by Dana the most*?"
This question was answered by first allocating the significant sustainability issues to five separate 'risk recipient' groups, i.e. People, Environment, Asset, Reputation and Budget. Per risk recipient the key sustainability risk indicators (K-SRI's) were identified. Taken together, the K-SRI's determine the sustainability risks for projects typical for the Dana organization.

The third and last research question was: "*What methodology is most suitable for Dana, considering the processes and systems Dana currently has in place*?"
In line with the existing processes and systems at Dana, a method was selected that uses so-called sustainability risk profiles for each project option. Such a sustainability risk profile is generated from the sustainability risk scores for the five risk recipients (People, Environment, Asset, Reputation and Budget). A first version of a tool was made using Microsoft Excel.

The project option, as selected with this methodology, which has the most favourable sustainability risk profile for the company (integrated risk), is thus consistent with the business principles as outlined in the Dana Risk Management Policy.

4.2 Discussion

4.2.1 Thoughts and considerations

The identification of a limited number of K-SRI's, which can be applied to every Dana project, will save considerable time in future option selection processes; the main risk indicators are already known and need not to be determined all over again.

The application of the methodology will have a positive effect on the number and effectiveness of control measures (and thus costs), due to the early identification of the sustainability risks.

Also, the use of the methodology will contribute to the company image among its stakeholders, because it makes the process of selecting a particular project option transparent.
Involving also (local) stakeholders in the assessment process itself, would not only add to the quality of the assessment but also contribute to the support and acceptance of the project.

On the other side it may be argued that, in specific cases, sustainability risks will be missed, precisely because the K-SRI's are 'fixed'. However, in practice this will be prevented by having experts, both from within and from outside the organization, do a short brainstorm session every time an assessment takes place; if necessary additional K-SRI's are then added or the existing K-SRI's will be modified.
It is noted that the methodology does not include *all* possible sustainability risks; because of the required speed and transparency of the methodology, the number of K-SRI's was deliberately kept limited.

In addition to that, the 'fixed' K-SRI's will be evaluated on a regular basis, because they should be indicative of the most significant sustainability risks at the moment; the relevance and significance of issues may change over time, depending on developments in and outside the Dana organization.

Furthermore, the resulting sustainability risk profiles are always simplified representations or estimations of the actual risks a project will encounter. The sustainability risk profiles are made during a very early stage of project development and thus by definition on the basis of incomplete or uncertain information.

It is a *screening* methodology and in no way a replacement for later more in-depth studies. The methodology does not intend to give the 'final' answer, but is meant to provide support to management decisions.

4.2.2 Validation and acceptance

In order to ensure sufficient support for the results within the Dana organization, different departments were asked to contribute to the research project. The involvement of the different stakeholders was particularly important for the formulation of specific K-SRI's and for the set-up of the tool itself.
For this thesis, the involvement of external stakeholders was kept limited to the identification and assessment of relevant and significant sustainability issues.

The initial reactions during the workshop were positive; the methodology certainly seems to fulfil a need that exists in the organization. During the workshop, the method was tested and the resulting sustainability risk profiles were considered to be realistic by those who participated. The limited time needed to complete the assessment (due to a limited number of K-SRI's and easy way of completing the Excel spreadsheet) were seen as a plus.

However, a general comment was that the methodology should not be too rigid; flexibility is always required to be able to account for local circumstances. This point was taken and included in the later version of the tool. More comprehensive testing and further refining of the methodology and tool in future new projects was still highly recommended.

4.3 Recommendations

It is recommended to further develop both the methodology and the current tool. More experience is needed in applying the methodology to future projects. Learnings from these projects can be used to improve the method. It is also recommended to involve more external stakeholders in order to 'test' the K-SRI's, especially those relevant for the people-related, environmental and reputational risks.

As mentioned in section 3.3.3 the use of the methodology needs to be integrated in the current management system. Only if it is part of the normal business processes and included in the annual management review, its proper application will be ensured.

Training is required for those directly involved in the project sustainability risk assessments and ownership needs to be established.

A proper roll-out of the methodology in the Dana NL organization (or even in the broader Dana group) needs to be scheduled.

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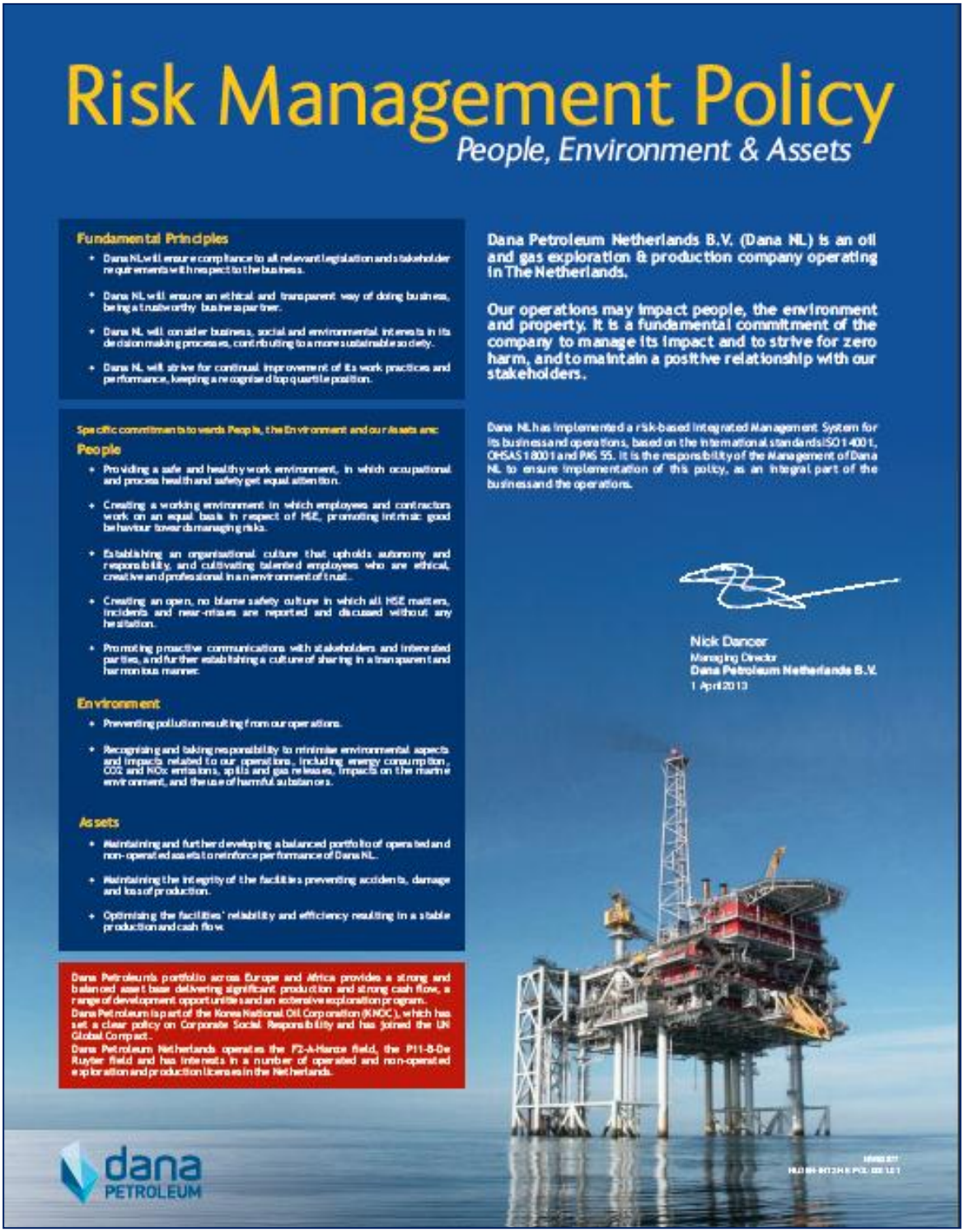
www.wbcsd.org	:	World Business Council for Sustainable Development
www.csreurope.org	:	European Business Network for Corporate Social Responsibility
www.unglobalcompact.org	:	United Nations Global Compact
www.humanrights.dk	:	Danish Institute for Human Rights
www.globalreporting.org	:	Global Reporting Initiative

Appendices

A Risk Management Policy



B Interviews summary

Summary interview 1 – Production Operations and Projects

Interviewee: Production Operations Manager

What are, in your opinion, the relevant issues with respect to Corporate Social Responsibility?

- Fair Operating Practices: not really an issue, because Dana does not deal directly with consumers or customers.
- Environment and safety: very important, because we are operating in a sensitive environment (most of the time).
- Human rights: in the operational teams everybody is equally important; discrimination is not tolerated (for example in the canteen there is only one table to prevent subgroups to be formed). In case of mal-behavior, people are warned, if no changes occur, people must leave the platform.
- Performance: everyone has a so-called Workplan (based on job description), also the long-term contractors (core crew). Regular feedback is given on one's performance. Individuals on the platform are 'owner' of certain procedures and work instructions. This ownership increases the quality of the documents.
- Code of conduct: is in place, stating do's and don'ts. Everybody wants to return home safely; hazardous behavior or acts are not tolerated. Behavior is also part of end of year performance reviews.
- Offshore crew rotate between both platforms as much as possible. Not feasible to do it more frequent than once in two years (because of complexity technical systems).
- Environment:
    - Rules and requirements: HSE department makes sure that the (regulatory and other) rules are known on the work floor.
    - Emissions: low NOx machines (better than legally required) some operational problems; actions to improve. Part of Improvement plan, with corporate approval.
    - Dana initiates several actions that are not required by law, e.g. action to change-out chemicals for OIW measurement, because of lower health risk.
- Oil&gas and sustainability: in case oil&gas run out, an alternative should be available. Saving of energy should be encouraged. In Western Europa / NL such initiatives are ongoing.
- Relaxation: the crew has several ways for relaxation; sports (also subsidized for onshore crew), music room, sauna, recreational room, game room, social media / computer room.
- Dana excels in: innovation, e.g. combined horizontal wells for oil and gas.
- As a modern company, Dana must be sustainable in its business where possible.

What does Dana do with respect to Stakeholder Engagement?

- Dana NL is helping out Dana Egypt in order to raise their performance level, also regarding safety.
- With respect to peers: safety is high priority for all operators. Dana is relatively young company, often is frontrunner, e.g. offshore competence management and health campaign. Ideas also come from offshore crew, are very involved.
- Oil industry still suffers from a bad image. Nogepa kept low profile for many years, which is now a disadvantage, because it is difficult to get new personnel.
- Employees:

- 50% employed by Dana / 50% contractors (core crew). On platforms no difference between groups; everybody participates in training programmes and social activities. Once in two years an off shore crew conference is organized.
- Communication (also between offshore and onshore) is always a point of attention, also differences in leadership stiles,
- Dana is attractive for people to work because of many different tasks, however sometimes people go to bigger companies because of more career opportunities.
- Relatively young crew, good working conditions.

What parameters do you find indicative of any risks during the project development cycle?

- The integrity of an installation must be guaranteed at all times. This integrity is determined by a number of factors that influence each other. Overall, these factors can be divided into four groups:
  1) Robust design (determine the 'process safety')
  2) Clear procedures (functioning management)
  3) Good maintenance (including a Management of Change process)
  4) Sufficient and competent, skilled, personnel (Human Resources)

Summary interview 2 – Supply Chain Management

Interviewee: SCM Manager

What are, in your opinion, the relevant issues with respect to Corporate Social Responsibility?

- Priotities for SCM:
  - Taking account of risk to people, safety, environment, politics, image. Is done through audits, e.g. on drilling rig
  - Price, costs
  - A tender board (MT) takes final decision
- Group SCM in Aberdeen
- Bribery: Dana accepts no gifts of more than 50 euro.
- Sufficient market competition for negotiation (always at least three suppliers).
- Oil industry is quite conventional, no front-runner in sustainable purchasing, often limited lifespan of installations is leading.
- An example of good practice is the requirement for suppliers not to use polystyrene packing materials to prevent pollution to sea.
- A dedicated consultant (NRG) is used for radio-active sources on board.
- Regulatory compliance is leading.
- Improving sustainability is good, also in the supply chain, but Dana is relatively small, still having a limited horizon.
- Employee protection has improved tremendously in previous decades.
- Labour practices: laid down in contracts.
- Environment: also mentioned in contracts.
- Consumer issues / Fair Operating Practices: these issues are getting more and more attention.

What does Dana do with respect to Stakeholder Engagement?

- Logistics are optimized within the industry (sharing of helicopter flights / supply vessels).

- Hiring temporary personnel:
  - Two types; technicians and specialists (e.g. geologists)
  - All temporary personnel gets induction training (do's and don'ts)
  - Also attention is paid to people in order to make them feel at home
- Dana member of Nevi / FPAL (vendor database, do supplier audits). At NEvi sustainable purchasing is on the agenda.
- For SCM the suppliers are the main stakeholders.

Summary interview 3 – Finance

Interviewee: Finance Director

What are, in your opinion, the relevant issues with respect to Corporate Social Responsibility?

- Safety and environment is first point on the agenda of each MT meeting.
- Safety / environment always priority (Zero Harm).
- Value sharing system: everybody has some target in his/her Workplan, which is related to HSEQ.
- For example also representatives of Finance were involved in a process safety event in the UK.
- Dana is performing quite well, although image with general public is not good.
- Dana has specific values in place. These are communicated well to all personnel.
- Taking responsibility from good practice: e.g. bid book for Petro-Canada Norway was made in NL.
- Opinion regarding CSR: skeptical in first instance, but advantage is clear. Still important to guard the budget, balance costs, wise to work on issues that are most relevant, use marketing only as appropriate for the scale of the business.

What does Dana do with respect to Stakeholder Engagement?

- Often other parties approach Finance ad-hoc, in case of financial damage. Focus on effects of these costs.
- Dana has eight to ten customers (refineries in NL, Germany). Clients do not ask Dana to be more socially responsible.
- Dana strives for clean production, safety (for environment and people) is core value, always fair operating practices.
- This is how we do business, but not actively communicated to external stakeholders.
- No certifications, because not legally required or required by customers. No need for more external audits, Dana has its own annual audit programme.

What parameters do you find indicative of any risks during the project development cycle?

- Parameters that come into play are many, but include for example:
  - CAPEX / OPEX
  - IRR (Internal Rate of Return)
  - NPV (Nett Present Value)
  - Capital Efficiency (NPT / CAPEX)
  - Revenues
  - Pay –back
  - If necessary . investments , tax (capital gains , property)

Summary interview 4 – Business Planning & Economics

Interviewee: Manager Planning & Economics

What are, in your opinion, the relevant issues with respect to Corporate Social Responsibility?

- Through its activities in the Netherlands, Dana generates quite some state revenues (via taxes, state profit payment and participation by EBN, Dana pays approximately 70% of total revenues to the state).
- CSR plays a part in the planning process:
  - Mostly through the HSE policy
  - Low-emissions equipment, part of KPI's, also annual bonus depends on it
  - Environment is taken into account in new business opportunities
- Dana is sponsor to several good causes, e.g. Kika. Also subsidising sports club for personnel.
- Dana has several core values and business principles. Also e.g. company policy is not to make telephone calls while driving.
- Policy with respect to health, safety and environment well developed within oil and gas industry, especially since the nineties.
- CSR important, primarily for risk reduction.

What does Dana do with respect to Stakeholder Engagement?

- Dana contributes to innovation, e.g. through educational programme with TU Delft.
- Considering the revenues, state is main stakeholder. Advantages of industry to society should be emphasized.
- Dana does its best to establish good networks within society.

What parameters do you find indicative of any risks during the project development cycle?

- In the early stage of exploration, parameters are used such as:
  - POS (Probability of Success), an estimate that is based on seismic information. If POS is < 20%, the financial risks are too great.
  - Proximity to infrastructure, the greater the distance to existing pipelines or platforms, the less attractive a project is. This is positively related to :
  - Volume reserves (P50 estimate); the larger the estimated volume of gas (BCM) that is present, the smaller the risks are. Gas volumes of 0.2 to 0.3 BCM need to accessed from an existing platform, while volumes far from existing infrastructure should be at least 1 BCM to make a project economically feasible. For oil this is different though.

Summary interview 5 – Health, Safety, Environment & Quality

Interviewee: HSEQ Manager

What are, in your opinion, the relevant issues with respect to Corporate Social Responsibility?

- Management of sustainability issues will contribute to the risk management of Dana
- Business operations compared to core business: operations are closely monitored, not core business. Difficult to be influenced by Dana.

What does Dana do with respect to Stakeholder Engagement?

- This is important when contracting a platform:
  - People on location, company rep. to look on actual site
  - Risk Acceptance Criteria are leading
- Risk acceptance criteria of Dana NL determine what we find acceptable or not
  - People aspects of ISO 26000 are not fully included yet in Risk Acc criteria
- Community issues : high schools, universities, contractors, own staff
- Contractors are all rated by:
  - Sales
  - Number of subcontractors
  - Safety critical / operational critical aspects
- High-risk category stakeholders more requirements, low-risk category easier selection process.
- Reputation is important, but this is not fully addressed in IMS as yet. People are alert though and identify reputational issues if they arise.
  - Example: chemicals suppliers with number of incidents involving wrong labeling: based on this an audit was done at this company, paying specific attention to that (= part of the management system)
- Currently audits of contractors are not as broad that they include all CSR issues, although sometimes for example employee satisfaction is included as well.
- Dana does not do audits at contractors of contractors as yet.
- Abroad, issues such as corruption and property rights become more relevant. This will be the case when Dana is expanding into Central Europe.
- Audits of new supplier:
  - Whether this is done is at the discretion of the Tender Board
  - In these audits also issues like corruption can be addressed

What parameters do you find indicative of any risks during the project development cycle?

- There are different types of risks. Within the industry lists are available summarizing all possible hazards for people and the environment. A clear distinction should be made in process safety and occupational health and safety.
- For Dana the most important (process) safety risks are addressed in the 'safety case' for the existing installations:
  - Loss of hydrocarbon containment
  - Structural failure
  - Ship collisions
  - Helicopter incidents
  - Dropped objects
- Health and safety risks are also included in the safety cases, as well as in the RI&E.
- For environment, the significant risks are included in the Environmental Aspects Register.

Summary interview 6 – Human Resources

Interviewee: Human Resources Manager

This interview was done by telephone.

- HR is involved in the process of hiring and employing personnel. Only those people are selected that will fit in with the Dana culture.
- Sustainability and safety are very important within Dana. These subjects are emphasized during induction of new personnel. Especially for offshore work, all people should realize the importance of a well-developed safety culture.
- HR focuses also on the well-being of people.
- A dedicated person within Dana is available to discuss sensitive issues (*vertrouwenspersoon*).
- Every new employee receives a code of conduct, describing the 'house rules'. Also the procedure is explained when not following the rules.
- Every employee has the possibility to call with an independent organization to discuss any problem related to work. This is anonymous and paid for by the company.
- Dana has an employee health program that was initiated after signs within the industry that the average weight of personnel was increasing. Now healthy food is available on all locations and sports is stimulated.
- Dana's sickness percentage is monitored and lies well below the national average.
- Dana has a clear policy regarding bribery. All Christmas gifts from suppliers are collected and distributed within the workforce through a lottery.

Summary interview 7 – General Management

Interviewee: Managing Director

What are, in your opinion, the relevant issues with respect to Corporate Social Responsibility?

- Attitude towards sustainability:
  - Do not run too far ahead of Dana UK; rest of Dana group needs time to catch up. Several group actions have been initiated (e.g. One Dana Management System)
  - This industry (i.e. in NL) is not communicating on this subject much (low profile).
  - Dana NL initiative not driven by head office or customers, but comes from people themselves.
  - It is part of our Risk Management policy
  - Question is how far you should you up the supply chain given the fact that Dana operates in NL context.
- Sustainability in the context of risk is important
- Core values are included in business processes
- Dana has available all necessary disciplines, also for new country entry
  - Not all procedures adjusted, will be done as soon as becomes relevant
- Scope IMS (management system):
  - Covers whole NL business, but not all in same extent
  - Eg commercial not so active, sub-surface.
    - Stakeholders Commercial are Gasterra and customers, but also partners
  - Left section of IMS with links to MS group is very dynamic
- HSEQ as a core value of this industry

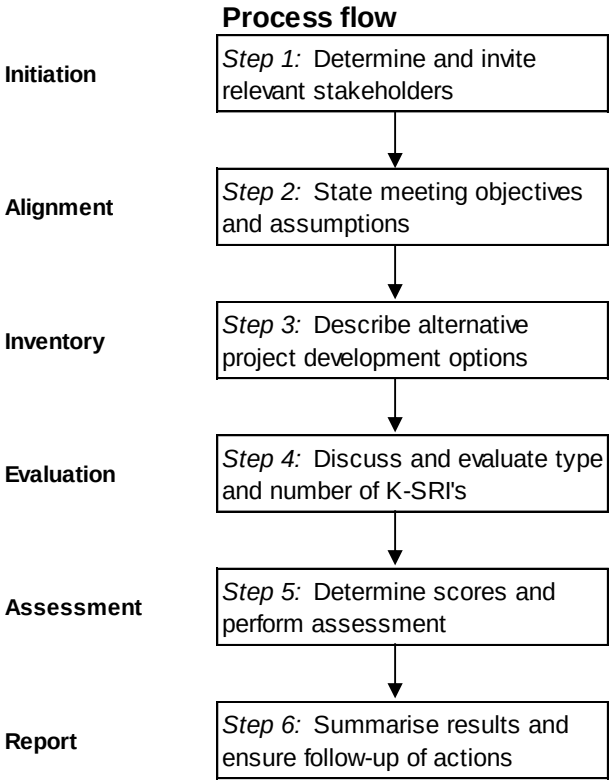
- Risk Assessment worksheet (template) available
- LCVA: life cycle value assessment, RaPiDS.
- Gatekeepers for PDM are always external (from other Dana business units)
- IMS is used intensively, is success, but must be maintained regularly.
- NOGEPA Legal committee plays important compliance role.
- Synergy is important for follow-up of actions, e.g. from Hazops, Hazids, Legal, etc).

What does Dana do with respect to Stakeholder Engagement?

- With respect to sub-surface:
    - Reputation is very important
    - Probably not all ISO 26000 issues addressed
- Dana does not enter into any business activity if it is not in line with our values

C Process flow

For doing an assessment using the developed methodology, a structured approach is required. This will ensure that the process is transparent and efficient and has the desired effect. The following section summarises the subsequent steps that must be taken for an assessment meeting.



Step 1 – Initiation

In this important first step the applicable stakeholders in the project are determined. The *key* stakeholders shall be invited to participate in the assessment meeting. Although depending on the complexity of the project, the total number of participants should preferably not be more than 10 persons. Participants are required from all the involved departments and disciplines. Also external stakeholders or experts should be invited, when relevant.

A f*acilitator* is recommended. This will ease the discussion, to keep oversight and to ensure progress. It is important that the facilitator is not involved in the discussion itself and does not influence the direction of the discussion.

Step 2 – Alignment

For all participants the objective of the meeting must be made clear. Also all assumptions must be noted. All should be aligned before proceeding to the next step.

Step 3 – Inventory

In step 3 of the process, the different project options need to be described. The level of detail is as high as possible, but should be relevant for the assessment.

Step 4 – Evaluation

A brief brainstorm session shall be done to determine whether the current K-SRI's are indeed applicable. If needed, additional or different K-SRI's are included. The duration of this step will depend on the specifics of the project (complexity, the number of stakeholders etc).

Step 5 – Assessment

This step concerns the actual allocation of values for the 'sensitivities' of risk recipients and the 'intensities' for the K-SRI's. The values are determined after consensus within the group of participants. The sustainability risk profiles for each project option follows from the calculated risk scores.

Step 6 – Report

All the results of the assessment meeting must be captured and summarised in a report. Although the report format is not that important, it is vital that also the motivation or assumptions behind the scores remain available and accessible, also later in the project cycle. Any actions from the meeting must be recorded as well and follow-up must be ensured. The facilitator of the meeting may best suitable to report the results.

D Issue selection

The results of the issue selection have been summarised in the below table.

ISO26000 issue selection

	√ = relevant, x = not relevant			Relevance	1, 2, or 3 points (max. 12)				Significance Score
ISO26000 CSR core subjects and issues:	**relationship with own activities**	**relationship with value chain and partners in sphere of influence**	**Daily activities as wel as extraordinary situations**	(√/X)	**extent of impact on stakeholders and sustainable development**	**potential effect of taking action or failing to take action on the issue**	**level of stakeholder concern about the issue**	**societal expectations of responsible behaviour wrt this issue**	(>50%)
					None = Score 1	None = Score 1	None = Score 1	None = Score 1	
					Some = Score 2	Some = Score 2	Some = Score 2	Some = Score 2	
					Extensive = Score 3	Extensive = Score 3	Extensive = Score 3	Extensive = Score 3	
Organizational Governance	✓	✓	✓	✓	2	3	3	2	83%
Human Rights	Human rights				Human Rights				
1. Due diligence	✓	✓	✓	✓	2	2	2	3	75%
2. Human rights risk situations		✓		✓	2	2	2	3	75%
3. Avoidance of complicity		✓	✓	✓	2	2	2	3	75%
4. Resolving grievances	✓	✓	✓	✓	2	2	2	3	75%
5. Discrimination and vulnerable groups	✓	✓	✓	✓	2	2	2	3	75%
6. Civil and political rights		✓		✓	2	2	2	3	75%
7. Economic, social and cultural rights		✓		✓	2	2	2	3	75%
8. Fundamental rights at work	✓	✓	✓	✓	2	2	2	3	75%
Labour practices	Labour practices				Labour practices				
1. Employment and employment relationships	✓			✓	3	3	2	2	83%
2. Conditions of work and social protection	✓	✓	✓	✓	3	3	2	2	83%
3. Social dialogue	✓	✓		✓	3	3	2	2	83%
4. Health and safety at work	✓	✓	✓	✓	3	3	2	2	83%
5. Human development and training in the workplace	✓			✓	3	3	2	2	83%
The Environment	The Environment				The Environment				
1. Prevention of pollution (incl. process safety)	✓	✓	✓	✓	3	3	3	3	100%
2. Sustainable resource use	✓	✓		✓	2	1	2	1	50%
3. Climate change mitigation and adaptation	✓	✓		✓	2	2	2	2	67%
4. Protection of the environment, biodiversity and restoration of natural habitats	✓	✓	✓	✓	3	3	3	3	100%
Fair operating practices	Fair operating practices				Fair operating practices				
1. Anti-corruption	✓	✓	✓	✓	2	3	3	3	92%
2. Responsible political involvement	✓	✓	✓	✓	1	2	2	2	58%
3. Fair competition	✓	✓	✓	✓	1	2	2	2	58%
4. Promoting social responsibility in the value chain	✓	✓	✓	✓	1	1	2	1	42%
5. Respect for property rights		✓		✓	2	3	2	3	83%
Consumer issues	Consumer issues				Consumer issues				
1. Fair marketing, factual and unbiased information and fair contractual practices	✓	✓		✓	1	1	2	2	50%
2. Protecting consumers' health and safety	✓	✓	✓	✓	1	1	1	1	33%
3. Sustainable consumption		✓		✓	1	1	1	1	33%
4. Consumer service, support, complaint and dispute resolution	✓	✓		✓	1	1	1	1	33%
5. Consumer data protection and privacy		✓		✓	1	1	1	1	33%
6. Access to essential services	✓	✓	✓	✓	2	3	3	3	92%
7. Education and awareness		✓	✓	✓	1	1	1	1	33%
Community involvement and development	Community involvement and development				Community involvement and development				
1. Community involvement		✓	✓	✓	1	1	2	2	50%
2. Education and culture	✓	✓		✓	1	1	1	1	33%
3. Employment creation and skills development	✓	✓		✓	2	2	2	2	67%
4. Technology development and access		✓		✓	2	2	2	2	67%
5. Wealth and income creation	✓	✓		✓	3	2	3	2	83%
6. Health		✓	✓	✓	1	1	1	1	33%
7. Social investment	✓	✓		✓	1	1	1	1	33%

E Clarification K-SRI's

Risk recipient: People

This group includes the K-SRI's that pose a threat to the occupational health or safety of the Dana employees or contractors working on the future installation.

1. Use of hazardous substances
Hazardous substances, e.g. many chemicals, are needed for the construction of new wells and for production of hydrocarbons. Also maintenance of the installation and pipelines require the use of chemical products. Working with these chemicals may lead to exposure and are thus a risk for the health of personnel.

2. Physically demanding work
Work could be physically demanding, e.g. due to noise, vibration, heat, cold, radiation. Prolonged exposure to such factors may lead to adverse health effects.

3. Difficult or poor working conditions
Work could involve working at height (use of scaffolding), working in confined spaces, or diving operations. Such challenging working conditions will occur periodically at certain installations during maintenance. For example for subsea wells frequent diving work may be required, and for production platforms working at heights may be needed.

4. High workload / job difficulty
Development of a new installation may lead to an increased workload and/or to more job complexity for e.g. an operator. This in turn may lead to increased risks for incidents.

5. Specialised skills required
Projects can be so complex, that specialists from outside the company are required, or internal training is needed. If this is the case, then this could be a risk for the project; it usually means that the project is more dependent on highly educated (and thus scarce) people.

6. High interest local communities (fisheries)
Local communities could become impacted by the project. In case a new offshore installation is constructed near fishing grounds, this could very well lead to opposition within the fishery community. Especially if the fishery community is sizeable and influential, this could pose a risk for the project.

Risk recipient: Environment

This group covers the K-SRI's that may affect the environment of the new installation, including (negative) impacts on the air, water, seabed and nature (flora and fauna).

1. Energy use
The more energy is consumed (as fossil fuel or electricity) in a production site, the more negative effect it has on the environment.

2. Resource use
With resource use is meant both the use of materials like steel, base materials for chemicals etc. and the use of fresh (drinking) water. Large-scale use can lead to depletion of these resources.

3. Land use
The use of land or space relates to the 'footprint' that the offshore installation (platform, pipelines, wells)

has on the seabed and on land. This may result in the (temporary or permanent) loss of biotopes. Account must also be taken of land required for onshore supply base or other infrastructure needed in the project.

4. Air emissions

Air emissions concern both greenhouse gases, having a global warming effect, and substances that have a more local impact on the air quality, like acidification or smog.

5. Water discharges

During the production of hydrocarbons, also water is produced to some extent. This water can be discharged to the sea. Some oil or chemicals still left in this produced water could thus end up in the environment. This may impact the water quality and thus have an (undesirable) effect on aquatic organisms.

6. Physical factors

The construction and operation of a new installation can lead to higher noise levels, heat, light, or radiation. This may impact the environment and biodiversity. When on-land, it impacts local communities as well.

7. Limited spill response capacity

In case of an oil or chemical spill sufficient resources (response personnel and equipment) should be available, on site or within the region. A limited response capacity will increase the risk for damage to the environment (and possible nearby communities, fisheries etc.).

Risk recipient: Asset

This group includes the K-SRI's that could be the cause of incidents resulting in (severe) damage to the installation and equipment.

1. Hydrocarbons under pressure

On oil and gas installations there are usually numerous vessels and piping that contain hydrocarbons. In case of loss of containment, hydrocarbons (under pressure) may cause a fire or explosion. This could result in damage to the installation (as well harm to personnel, the environment and local communities).

2. Local (shipping) traffic

An installation (platform) being built close to shipping lanes, will have an increased risk for ship collisions. Also the presence of fishing vessels should be taken into account. For onshore assets (e.g. supply base) the local traffic (number of trucks) will be relevant.

3. Helicopter flights

For manned platforms regular helicopter flights will be needed. Especially during take-off and landing risks are significant. In case of a crash, the installation may be damaged severely (in addition to the potential casualties).

4. Supply boat movements

Transport of goods and materials are normally done by supply vessel. More vessels will increase the risk for collisions. Also, the many crane operations could result in dropped objects from these loads, which could damage the platform.

In addition, if the required number of supply vessels is high, this could mean a higher risk for the well-functioning of the asset, especially when dealing with unreliable or poorly developed local logistical services.

5. Use of existing infrastructure
The new installation may use existing infrastructure, like pipelines or other installations, which are operated by a 3rd party. In such case, the availability and reliability of the infrastructure should be taken into account. Especially timely and preventative maintenance is important in this respect. This dependence on other operators is a risk for (the functioning of) the asset.
The same if the installation depends on the availability of a local port or harbour.

6. Complexity
The complexity of the planned installation is relevant in the context of business (operations) and maintenance. The greater the complexity, the greater the chance is that system, process or human error leads to a loss.

7. Extreme weather conditions
Natural disasters or extreme weather conditions (storms, cold/heat, high water, etc) could have an impact on the integrity of the installation or on the logistics for necessary supplies or manning. This may jeopardise (the functioning of) the installation.

Risk recipient: Reputation

This group covers K-SRI's that can potentially damage the reputation of Dana if not, or insufficiently, taken into account before or during project development.

1. Expected resistance from civil society organizations / NGOs
The public interest a project might raise or the media attention it could receive, is something to take into account. If this is done in a too late stage, the project could be delayed or even be terminated in case of negative publicity.

2. Problematic licensing
The number of required permits could be high. Especially for more innovative or technically challenging project, permits could be more difficult to obtain.
This risk for the success of the project will increase in case of poor government capacity.

3. Complex supply chain
A complex (local) supply chain is often not very transparent. In such cases human rights risk situations or unethical business practices could take place somewhere in the supply chain. Although there might be no direct involvement, this may have a negative effect on the company reputation.

4. Culture of corruption
If a new project development takes place in an environment where corruption is commonly found, this could seriously impact the reputation of the company. This risk is especially high in case of a high dependence of third parties.

5. Ethnic/religious tensions
Tensions that exist in a region or country, for ethnic or religious reasons, could lead to conflict and to a political instable situation. This would result in a high risk situation for any project.

6. Poverty/income inequalities
It is a good thing to recruit people from local communities for a project. However, if poverty is an issue within this community, this could lead to increasing income inequalities within that community. This in turn may pose a risk to the project.

Risk recipient: Budget

The K-SRI's in this group include the type of indicators that, in case of (huge) excesses, have a negative impact on the economic and financial situation of the project or that of the company as a whole.

1. CAPEX

The CAPEX concern the investment costs for the project. The financial resources are usually obtained from financial institutions or banks, but could also come from the company's own reserves. In the end, the invested money should be returned within a certain time period. The higher the investment costs, the longer this will take and the greater the economic and financial risk for the project.

2. OPEX

These are the operating costs, i.e. costs needed to operate the installation. The higher these costs, the longer the payback period for the installation.

3. Decommissioning costs

Already during the design of an installation the possible ways for decommissioning should be taken into account. For this, sufficient funds must be available.

4. Unfavourable fiscal/tax regime

The fiscal or tax regime can be unfavourable for certain development projects. It could be decisive in whether a project becomes economically feasible or not.

5. Partner opposition

Project or business partners can oppose to a specific development option. Alternatively it may be the case that no (reliable) project partners can be found. In both cases the success of the project will be at risk.

F Identification K-SRI's

Indicators that pose a risk for the significant sustainability issues of Dana were derived from different sources. All these potential sustainability risk indicators have been assessed on:

a) Relevance for typical Dana projects
b) Potential sustainability risk
c) Influence on project option selection

Each risk indicator was scored as low (1) or high (2) for the above three criteria. Indicators with total scores (i.e. the sum of individual scores) of 5 or 6 were identified as potential *Key* Sustainability Risk Indicators.

Risk indicator (SRI)	Relevance (a)	Risk (b)	Influence (c)	Score (a+b+c)
Weak rule of law	2	1	1	4
Poor governmental capacity	2	2	1	5
Ethnic/religious tensions	2	2	1	5
Conflict or political instability	2	2	1	5
Poverty/income inequalities	1	2	2	5
Draught, natural disasters	2	2	1	5
Complex supply chain (not transparent)	2	2	2	6
Proximity indigenous peoples	1	2	1	4
Possible child labour	1	2	1	4
Public security providers required	1	1	1	3
High number of involved stakeholders	2	2	1	5
Public/NGO resistance	2	2	2	6
Resistance from communities	2	2	2	6
Poor societal status local women	1	1	1	3
Presence minority groups (discrimination)	1	2	1	4
No freedom of speech/meeting	1	1	1	3
No freedom of ownership	1	1	1	3
Poor functioning educational system	2	2	2	6
Poor access to drinking water, medical care	1	1	1	3
No freedom of bargaining	1	1	1	3
Possible forced labour	1	2	1	4
Discrimination in work/profession	1	2	1	4
Workload/job difficulty	2	2	2	6
Specific national/religious traditions	1	1	1	3
No freedom of association	1	1	1	3
No collective bargaining	1	1	1	3
Use of dangerous substances	2	2	2	6
Physically demanding work	2	2	2	6

Poor working conditions	2	2	2	6
HC volumes under pressure	2	2	2	6
Road traffic (accidents)	2	1	1	4
Shipping traffic (collisions)	2	2	2	6
Number of helicopter flights (crashes)	2	2	2	6
Crane operations (dropped objects)	2	2	2	6
Specialised skills required	2	2	2	6
Complex project organisation	2	2	1	5
Many interfaces within project	2	2	1	5
Air emissions	2	2	2	6
Water discharges	2	2	2	6
Noise/light	2	2	2	6
High energy use	1	2	2	5
Resources/materials use	2	2	2	6
Fuel usage	1	2	2	5
Adverse weather conditions	2	2	1	5
Land use/space required	2	2	2	6
No spill response capacity	2	2	2	6
Local culture of corruption	2	2	2	6
Problematic permitting	2	2	2	6
Poor transparency wrt lobby, political process	1	2	1	4
No clear contracting	1	2	1	4
Unfair contract conditions	2	1	1	4
Poor grid, transportation system	2	2	2	6
Involvement local community	2	2	1	5
Impact local community	2	2	2	6
High outsourcing	2	2	2	6
Poor availability educated people	2	2	2	6
Local partnerships	1	1	1	3
Distance to local infrastructure	2	1	2	5
Use of local infrastructure	2	2	2	6
Complexity planned installation	2	2	2	6
Hign Capex, Opex	2	2	2	6
Poor profitability (RoR)	2	1	2	5
High decommissioning costs	2	1	2	5
Unfavourable fiscal/tax regime	2	2	2	6
No reliable local/regional suppliers	2	2	1	5
No reliable business partners	2	1	2	5
Partner opposition likely	2	2	2	6
Availability local port/harbour	2	1	2	5
Absence local supply infrastructure, logistics	2	2	2	6
Impact on local port infrastructure	1	1	1	3

G Explanation risk values

Calculating risk values

The risk value for each K-SRI is calculated by multiplying the sensitivity of the risk recipient with the intensity of the K-SRI, or:

Risk value = Sensitivity Risk recipient x Intensity K-SRI

In practise the values for sensitivity and intensity will be determined through expert judgment. To aid in determining these values descriptions of sensitivity levels for each risk recipient are given below. Also some examples are provided for determining the K-SRI intensities.

Sensitivity risk recipients

People

Value	Category	Description
1	Not sensitive	Potential damage to nearby communities or to health of workers is virtually eliminated
2	Little sensitive	Some effects or single injury may occur
3	Moderately sensitive	Average effects or some injuries are quite possible
4	Sensitive	Serious effects, health damage, injuries or even a fatality could occur
5	Very sensitive	Radical changes, multiple victims or fatalities could occur

Environment

Value	Category	Description
1	Not sensitive	Ecological damage or any environmental disruption is virtually eliminated
2	Little sensitive	Minor damage or disruption may occur; recovery within hours to days
3	Moderately sensitive	Local damage or disruption is possible; recovery within several weeks
4	Sensitive	Major environmental damage is possible; recovery only after months or years
5	Very sensitive	Massive and lasting environmental damage is possible

Asset

Value	Category	Description
1	Not sensitive	Damage to the installation is virtually eliminated
2	Little sensitive	Damage to parts of the installation could occur; repair can be done quickly
3	Moderately sensitive	Damage is possible with the loss of a single unit; limited production loss
4	Sensitive	Damage can result in failure of multiple units; prolonged production deferment
5	Very sensitive	Serious damage can occur with catastrophic consequences

Reputation

Value	Category	Description
1	Not sensitive	Robust reputation and only few influential stakeholders
2	Little sensitive	Some reputational damage may occur, however only with specific stakeholders
3	Moderately sensitive	Damaged reputation involving several (influential) stakeholders is possible
4	Sensitive	Serious damage to reputation with many different stakeholders
5	Very sensitive	Total loss of reputation with long-term effects is possible

Budget

Value	Category	Description
1	Not sensitive	Hardly any financial loss expected (<10,000 euro)
2	Little sensitive	Financial damage may occur, leading to a loss of <100,000 euro
3	Moderately sensitive	Financial loss is very well possible, but limited to no more than 500,000 euro
4	Sensitive	Possibly significant financial impact, with damage of more than 500,000 euro
5	Very sensitive	Substantial financial damage of more than 1 million euro is possible

Intensity K-SRI's

Use of hazardous substances

Value	Category	Description
1	Marginal	No or hardly any use of chemicals
2	Limited	Chemicals are only sparingly needed e.g. for maintenance
3	Average	Chemicals are used both during maintenance and for production
4	Considerable	Chemicals are widely used, are absolutely essential for production
5	High	Chemicals are required extensively and in high quantities for regular production operations

Water discharges

Value	Category	Description
1	Marginal	No or hardly any discharges to water
2	Limited	Discharge to water takes place occasionally, or in limited quantities
3	Average	Some discharge, from one or more sources, takes place continuously
4	Considerable	Discharge of considerable quantities of water, in increasing amounts
5	High	(Very) high quantities of water are discharged continuously

Helicopter flights

Value	Category	Description
1	Marginal	No or hardly any helicopter flights
2	Limited	Helicopter flights take place occasionally e.g. only for maintenance
3	Average	Helicopters are needed regularly, e.g. for transport of personnel (1-2x/wk)
4	Considerable	Helicopter flights are for various purposes and take place quite often (2-4x/wk)
5	High	A (very) large number of helicopter flights is required (>4x/wk)

Expected public/NGO opposition

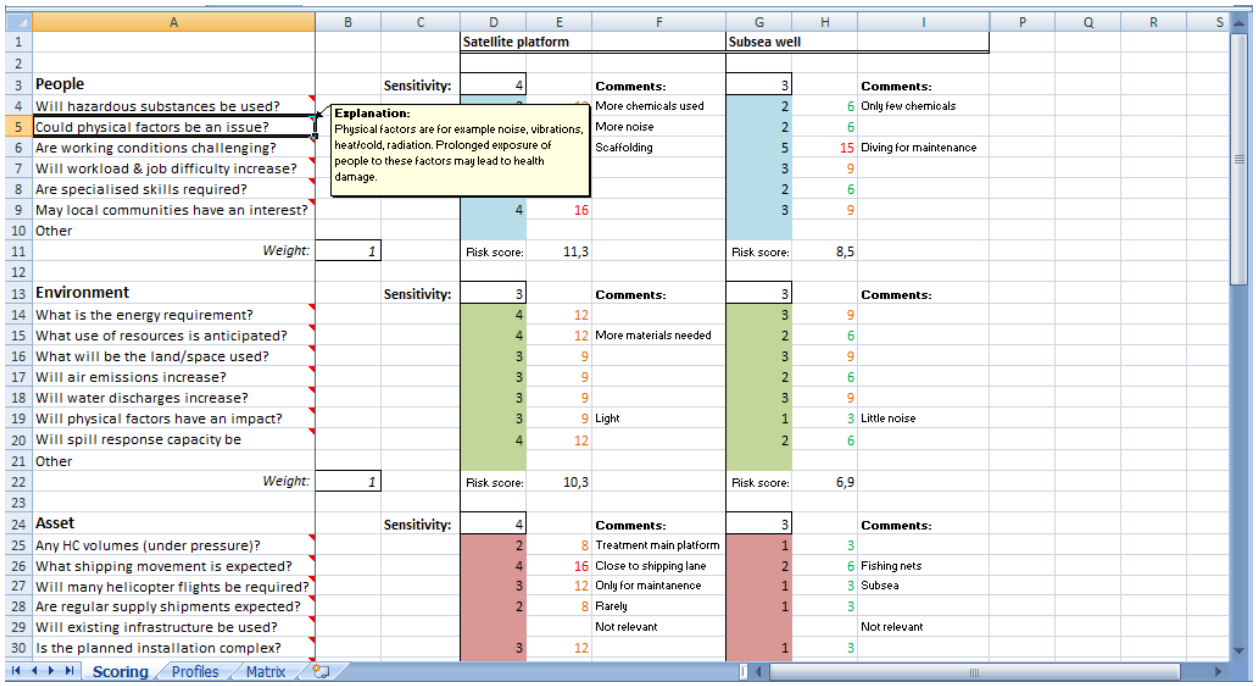
Value	Category	Description
1	Marginal	Any concerns or special attention from society are virtually absent
2	Limited	Some attention may be there, however no concerns
3	Average	Attention and expressions of concern in (local) media or politics
4	Considerable	(Huge) concerns with NGO's and (national) authorities, leading to many questions
5	High	Extensive (negative) publicity and potentially restrictive measures from authorities

Complex supply chain

Value	Category	Description
1	Marginal	Only a few (well-known) suppliers
2	Limited	Several 2nd tier suppliers, most of which are known and nationally based
3	Average	Many 2nd tier and also some 3rd tier suppliers, some internationally based
4	Considerable	Considerable number of (international) 3rd tier suppliers
5	High	Numerous national and international 3rd tier suppliers

H Screenshots tool

For each K-SRI a clarification is available, as illustrated below:

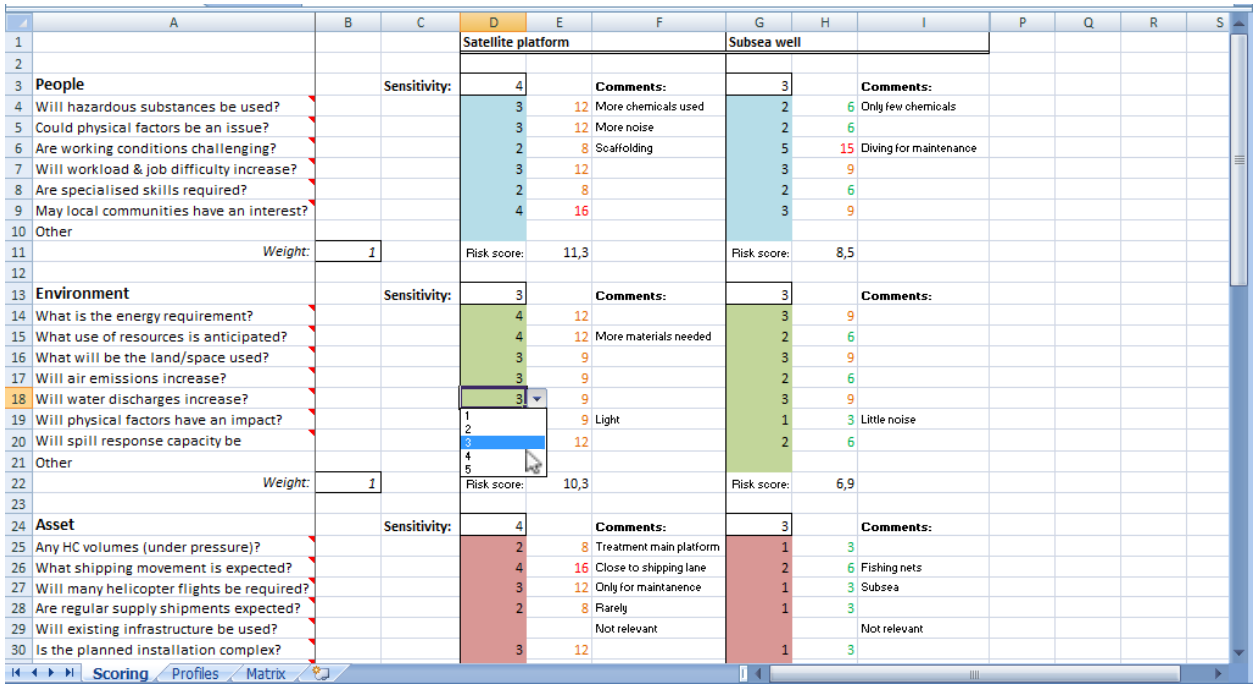


	A	B	C	D	E	F	G	H	I
1				Satellite platform			Subsea well		
3	**People**		Sensitivity:	4		Comments:	3		Comments:
4	Will hazardous substances be used?					More chemicals used	2	6	Only few chemicals
5	Could physical factors be an issue?					More noise	2	6	
6	Are working conditions challenging?					Scaffolding	5	15	Diving for maintenance
7	Will workload & job difficulty increase?						3	9	
8	Are specialised skills required?						2	6	
9	May local communities have an interest?			4	16		3	9	
10	Other								
11	*Weight:*	1		Risk score:	11,3		Risk score:	8,5	
13	**Environment**		Sensitivity:	3		Comments:	3		Comments:
14	What is the energy requirement?			4	12		3	9	
15	What use of resources is anticipated?			4	12	More materials needed	2	6	
16	What will be the land/space used?			3	9		3	9	
17	Will air emissions increase?			3	9		2	6	
18	Will water discharges increase?			3	9		3	9	
19	Will physical factors have an impact?			3	9	Light	1	3	Little noise
20	Will spill response capacity be			4	12		2	6	
21	Other								
22	*Weight:*	1		Risk score:	10,3		Risk score:	6,9	
24	**Asset**		Sensitivity:	4		Comments:	3		Comments:
25	Any HC volumes (under pressure)?			2	8	Treatment main platform	1	3	
26	What shipping movement is expected?			4	16	Close to shipping lane	2	6	Fishing nets
27	Will many helicopter flights be required?			3	12	Only for maintanence	1	3	Subsea
28	Are regular supply shipments expected?			2	8	Rarely	1	3	
29	Will existing infrastructure be used?					Not relevant			Not relevant
30	Is the planned installation complex?			3	12		1	3	

Explanation:
Physical factors are for example noise, vibrations, heat/cold, radiation. Prolonged exposure of people to these factors may lead to health damage.

Scoring | Profiles | Matrix

The values for sensitivity and intensity can be filled in using a *dropdown* menu:

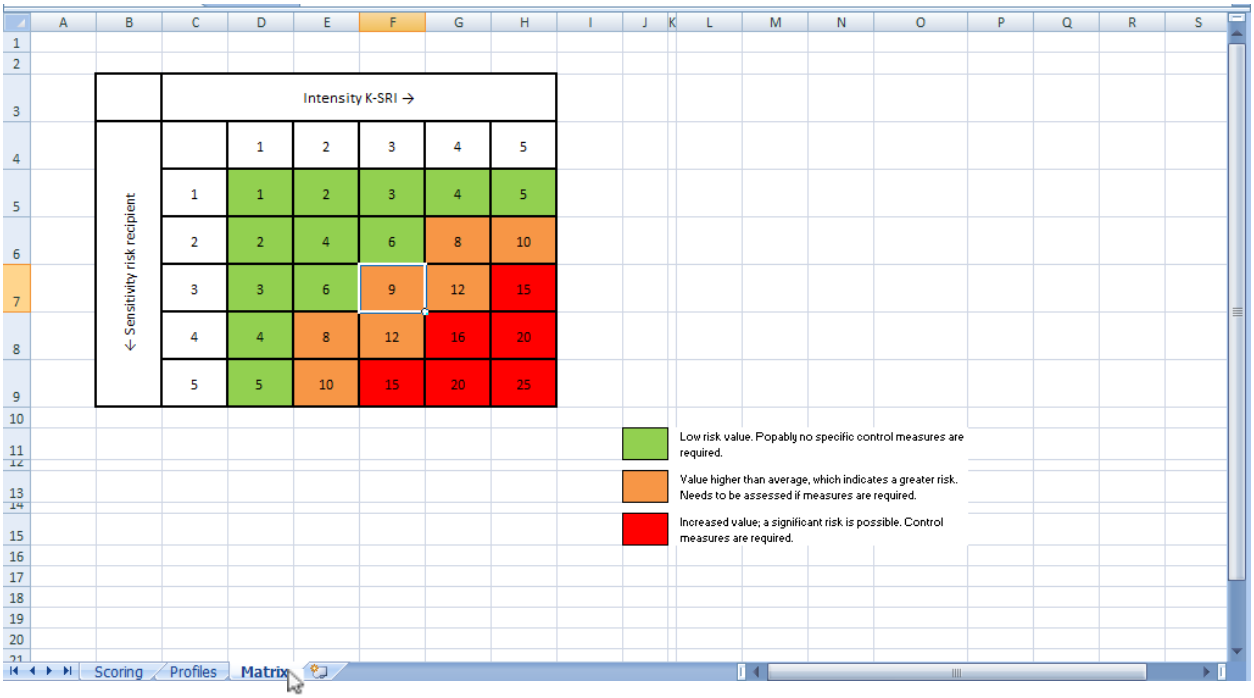


	A	B	C	D	E	F	G	H	I
1				Satellite platform			Subsea well		
3	**People**		Sensitivity:	4		Comments:	3		Comments:
4	Will hazardous substances be used?			3	12	More chemicals used	2	6	Only few chemicals
5	Could physical factors be an issue?			3	12	More noise	2	6	
6	Are working conditions challenging?			2	8	Scaffolding	5	15	Diving for maintenance
7	Will workload & job difficulty increase?			3	12		3	9	
8	Are specialised skills required?			2	8		2	6	
9	May local communities have an interest?			4	16		3	9	
10	Other								
11	*Weight:*	1		Risk score:	11,3		Risk score:	8,5	
13	**Environment**		Sensitivity:	3		Comments:	3		Comments:
14	What is the energy requirement?			4	12		3	9	
15	What use of resources is anticipated?			4	12	More materials needed	2	6	
16	What will be the land/space used?			3	9		3	9	
17	Will air emissions increase?			3	9		2	6	
18	Will water discharges increase?			3	9		3	9	
19	Will physical factors have an impact?			3	9	Light	1	3	Little noise
20	Will spill response capacity be			4	12		2	6	
21	Other								
22	*Weight:*	1		Risk score:	10,3		Risk score:	6,9	
24	**Asset**		Sensitivity:	4		Comments:	3		Comments:
25	Any HC volumes (under pressure)?			2	8	Treatment main platform	1	3	
26	What shipping movement is expected?			4	16	Close to shipping lane	2	6	Fishing nets
27	Will many helicopter flights be required?			3	12	Only for maintanence	1	3	Subsea
28	Are regular supply shipments expected?			2	8	Rarely	1	3	
29	Will existing infrastructure be used?					Not relevant			Not relevant
30	Is the planned installation complex?			3	12		1	3	

Dropdown: 1, 2, 3, 4, 5

Scoring | Profiles | Matrix

A scoring matrix is included on a separate tab:



	Intensity K-SRI →					
← Sensitivity risk recipient		1	2	3	4	5
	1	1	2	3	4	5
	2	2	4	6	8	10
	3	3	6	9	12	15
	4	4	8	12	16	20
	5	5	10	15	20	25

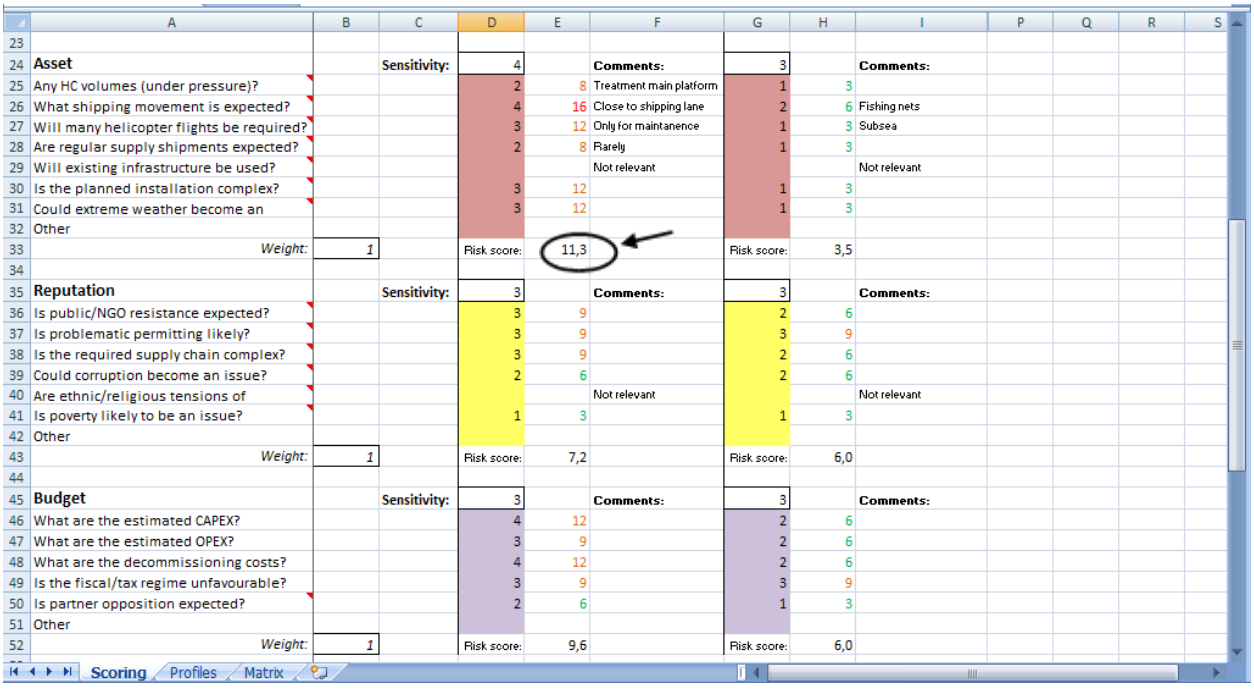
Low risk value. Popably no specific control measures are required.

Value higher than average, which indicates a greater risk. Needs to be assessed if measures are required.

Increased value; a significant risk is possible. Control measures are required.

Scoring | Profiles | Matrix

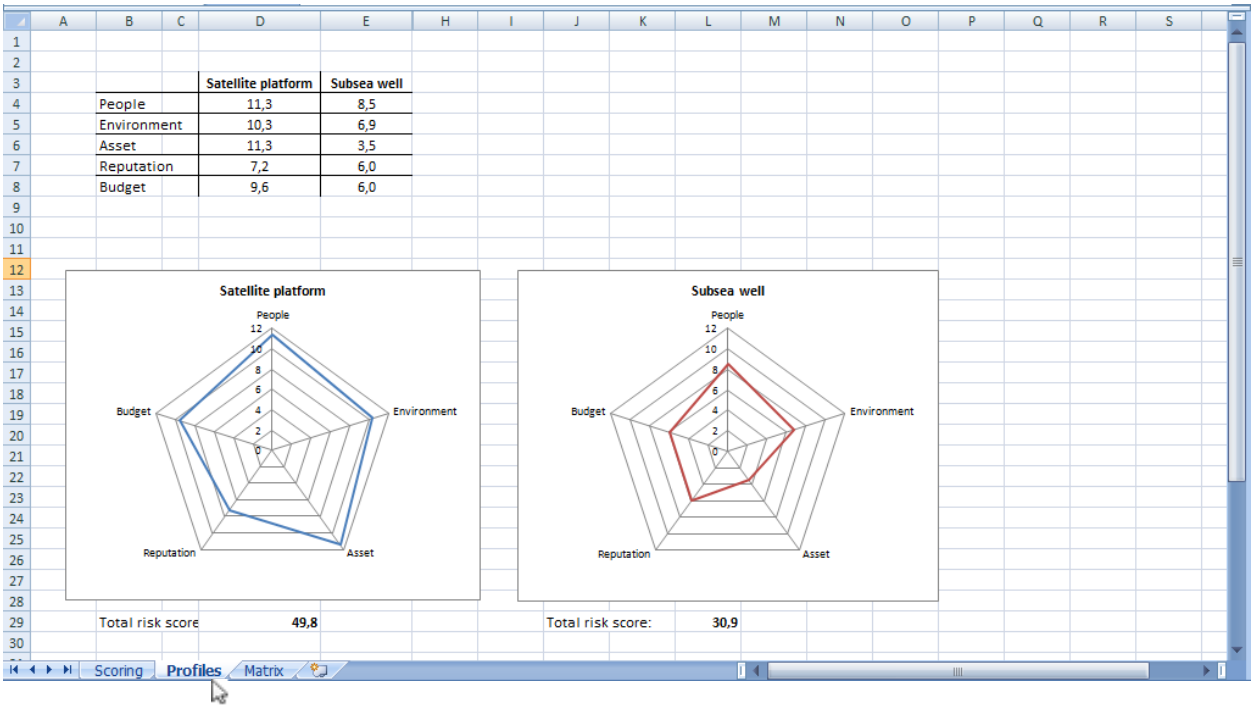
When all K-SRI's are filled in, the risk score is automatically calculated for each risk recipient:



Asset		**Sensitivity:**	4		**Comments:**	3		**Comments:**
Any HC volumes (under pressure)?			2	8	Treatment main platform	1	3	
What shipping movement is expected?			4	16	Close to shipping lane	2	6	Fishing nets
Will many helicopter flights be required?			3	12	Only for maintanence	1	3	Subsea
Are regular supply shipments expected?			2	8	Rarely	1	3	
Will existing infrastructure be used?					Not relevant			Not relevant
Is the planned installation complex?			3	12		1	3	
Could extreme weather become an			3	12		1	3	
Other								
Weight:	1		Risk score:	11,3		Risk score:	3,5	
Reputation		**Sensitivity:**	3		**Comments:**	3		**Comments:**
Is public/NGO resistance expected?			3	9		2	6	
Is problematic permitting likely?			3	9		3	9	
Is the required supply chain complex?			3	9		2	6	
Could corruption become an issue?			2	6		2	6	
Are ethnic/religious tensions of					Not relevant			Not relevant
Is poverty likely to be an issue?			1	3		1	3	
Other								
Weight:	1		Risk score:	7,2		Risk score:	6,0	
Budget		**Sensitivity:**	3		**Comments:**	3		**Comments:**
What are the estimated CAPEX?			4	12		2	6	
What are the estimated OPEX?			3	9		2	6	
What are the decommissioning costs?			4	12		2	6	
Is the fiscal/tax regime unfavourable?			3	9		3	9	
Is partner opposition expected?			2	6		1	3	
Other								
Weight:	1		Risk score:	9,6		Risk score:	6,0	

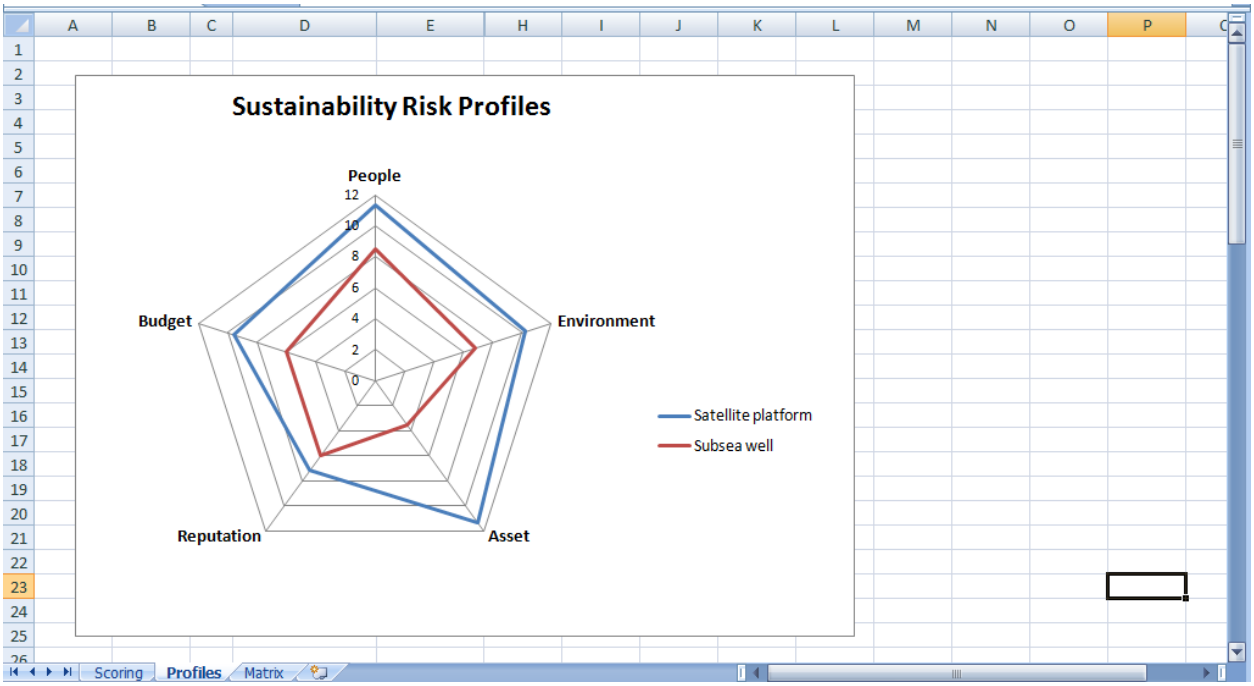
Scoring | Profiles | Matrix

The *total* sustainability risk score for each project option is reflected in its sustainability risk profile:



	Satellite platform	Subsea well
People	11,3	8,5
Environment	10,3	6,9
Asset	11,3	3,5
Reputation	7,2	6,0
Budget	9,6	6,0

For convenience the sustainability risk profiles for all project options can be shown in one figure, as illustrated below:



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Frank Boelsma

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