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# Effective Risk Management in SOGO Life Cycle Management



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Siemens AS

University of Stavanger (UiS)

A thesis submitted for the degree of

*MSc. Industrial Economics*

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Mohamed Omar Ali

## **Abstract**

Siemens delivers complete automation, electrical and telecommunications systems to the oil and gas industry. In addition it delivers turbine, compressor and process solutions. Through innovative projects, Siemens has over time built up expertise related to the offshore industry.

After new or upgrade projects the offshore installation gets maintenance or support through the life cycle management organization at Siemens. Small to medium modification projects are executed by the life cycle management. Risk assessment on these projects show different risks when it comes to estimation and pricing of projects, planning and executing, resource management, competence and knowledge.

Risk is assessed in all project activities. Siemens uses the risk management tool PIMS R3, where the project management can write risks, and assign actions, ownership and deadlines to the risks. The objective for the risk management tool is to identify, evaluate and assign action to minimize risk.

Risk reduction measurements are important. Such can be better communication towards clients and prediction of workload. A smarter resource allocation is vital, so correct resource can be put into the correct project. Lesson learned sessions at the end of the project and in the beginning of a similar could reduce non conformance. Knowledge building measures and training could reduce non conformance and make the project more profitable.

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# Chapter 1

## Introduction

### 1.1 Background

Siemens AS, Oil and Gas Offshore division (SOGO) delivers safety and automation systems (SAS) to offshore oil plants world wide. Siemens as an organization is mainly divided into two parts. The project organization (PEP - Project Execution Procurement) which executes projects such as delivery of new SAS system to new plants or upgrades to existing plants and the life cycle management (LCM) organization which supports the operation of SAS system in maintenance and small to medium projects.

The life cycle management (LCM) department supports the plant operations 24 hours a day, all year round. It ensures maximum reliability of offshore installations. With a maintenance agreement the clients have the security of both equipment, software functionality and resources with right competence for the offshore installation. This is to ensure maximum safety, efficiency and productivity of the installation facilities. Services can be delivered by the project as a stand-alone service or as a maintenance agreement. The LCM ensures maximum uptime of the installations, reduces the risk of unpredictable downtime and increases the plant's operational efficiency and productivity.

Siemens provide simulation / lab and spare parts facilities, product logistics ser-

vices and provides stock of critical spare parts. Courier delivery can be provided if there is an urgent need for critical spare parts. Training and courses are also delivered to customers when and where it suits them based on their requirements.

Siemens utilizes the company's large engineering pool to provide quality services and modification projects. A strong integration between project management, engineering and construction phase is their strength. Knowledge and skills are transferred from the project support group that maintains documentation related to the plant. They have qualified personnel with authorized support for oil and gas industry. They have gained experience over many years through assignments on offshore installations, including the North Sea, Mexico, Brazil, Denmark, Qatar, Singapore and the Caspian Sea.

This thesis will focus on risk management in the LCM department.

### 1.2 Purpose of this thesis

The purpose of this thesis is to investigate the risks associated with projects delivered by SOGO LCM. The thesis will review project activities and analyze the risks associated with them. Then it will suggest some compensatory measures to reduce the risk. Risk in the following project activities will be evaluated

- Bidding Phase
- Estimation and actual result
- Material resources
- Time
- Cost
- Human resources
- Access to appropriate resources at the right time
- Expertise

- Purchasing
- Variation Order
- Suspension from the supplier side
- Postponement of the Customer
- Subcontractors
- Knowledge

### 1.3 Content

This thesis will report on following parts

- Introduction
- Presentation of Siemens LCM organization
- Risk assessment of project
- Case problem with interviews
- Discussion
- Conclusions with proposals of risk reduction techniques

# Chapter 2

## LCM Projects

This chapter will describe the different parts of a LCM project and its risk analysis.

### 2.1 Project handover

All projects are, as described earlier, executed by the PEP department in Siemens. When projects end, the warranty and maintenance requests are handled by the LCM department. The figure 2.1 <sup>1</sup> describes the process of handover from PEP to LCM.

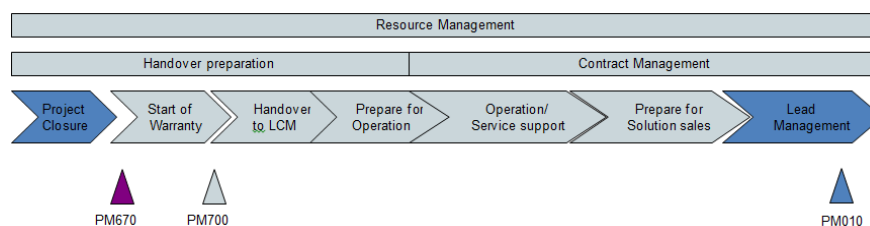


Figure 2.1: Project Handed over from PEP

Handover of project are done where representatives of both organization present.

<sup>1</sup>Siemens QMS portal in Intranet

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### **2.1.1 Handover meeting**

At the end and the closing phase of a new or upgrade project, the project managed by the PEP department is responsible for issuing invitations to, and executing the handover meeting. In this meeting the PEP will handover a full set of documentation to LCM. The documentation consist of:

- Punch list
- Document describing where master software is stored
- Final documentation as supplied to the customer (specify whether this is AS Built or AS Commissioned)
- The latest version of the suppliers master document list
- Any spare parts lists not included in the final documentation
- Any internal reports relating to the equipment or its use (including failure reports)
- A copy of the purchase order / contract.

After Handover, LCM is responsible for notifying parties of the termination of the guarantee period. Usually this means that both the customer and the project organization will be notified in writing. The project organization will remain responsible for closing of any remaining bank guarantees and releasing any contingencies.

The LCM manager is responsible for accepting the handover, or to clearly state the reasons for rejecting the handover. In case of the latter scenario the LCM manager is responsible for listing the actions that need to be completed to enable the handover to be accepted.

## **2.2 LCM Project Execution**

LCM projects are established when there is need for an improvement or update of the delivered system. They can come from the customer directly through a

preexisting frame contract, or Siemens seeks an opportunity of selling a better or newer technology to the customer.

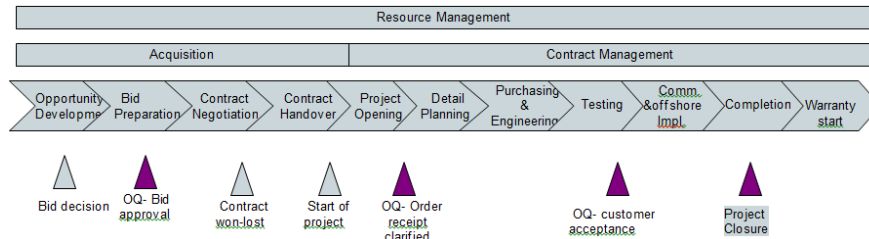


Figure 2.2: LCM Project Execution

### 2.2.1 Bid phase

The sales department is responsible for identifying and analyzing business opportunities. They have to prepare and initiate the Go / No-Go decision. Following the procedure below

- Sales support from technical project manager or lead engineer
- Submit budget offer to customer
- Analysis of inquiry and prepare the bid strategy
- Initiate the bid preparation process
- Internal approval of the cost calculation
- Internal approval of project structure and execution model
- Internal approval of the customer price calculation
- Issue bid to customer
- Prepare for and execute bid clarifications and negotiations

Normally, offers in LCM are small, and run over relatively short periods. It is therefore crucial to find the necessary technical support as quickly as possible. When a LCM bid/sales manager is in need of technical support outside the

LCM organization, this can be requested from PEP and from the sales department.

The bid/sales managers first task is to clarify what type of technical support the bid is in need of. Secondly they should contact known personnel with the required knowledge for support. The bid/sales manager also needs to contact the persons leader, to be permitted to use this resource for support. In cases where the bid/sales manager does not know the required personnel with the desired knowledge, PEP administration shall be contacted for help.

### 2.2.2 LCM sales to LCM Execution

A handover meeting is arranged for all projects, also for new purchase orders inside a frame agreement. Call for meetings and supporting documentation is announced and issued weeks in advance, allowing the project members to familiarize themselves with the project, both the technical and commercial part. Missing or incomplete documentation is notified early. Agenda, meeting participation and underlying documents are in bullet points listed below. The documents relating to the project execution are submitted to the project manager who further distributes them to the required LCM manager. Contracts, inquiries and bids are the key documents for the meeting. These and other relevant documentation are the basis on which participants understanding is attained with respect to:

- Scope of delivery
- HSSE requirements
- Delivery milestones
- Technical solutions
- Cost budget
- Identifiable risks and opportunities
- Resource requirements for the project

## 2. LCM Projects

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- Possible grey areas between customer and supplier in interpretation of the contract
- Options that the customer can buy in addition to the main purchase order (PO)
- Possible cost elements falling outside the project to be clarified.
- Review of the project's main topics
- Identification of critical activities; evaluation of risks
- Define HSSE regulations and activities, identify possible risks
- Determine project milestones and date for finalizing the project execution plan
- Agree a date for the technical start- up meeting/ review (TR)
- Proposed actions to ensure an efficient project execution
- Standard tools and solutions to be used
- Review of Lessons Learned potential and project evaluation reports from similar earlier projects
- Cost control overview
- Co- ordination of part- deliveries in the project
- Reporting, internally and externally
- Change handling internally and externally
- Review of sub-suppliers and detailed responsibility list, re. supplier management
- Review of job descriptions and detailed review of responsibility matrix for all main activities
- Review document control, approval and control



In preparation for the meeting, the project manager in cooperation with the technical project manager has the responsibility of establishing the project execution plan which is reviewed during the meeting.

### 2.2.3 Project startup-meeting

A start-up meeting is to be arranged for all projects. In major projects or projects with more contract packages, the project manager considers whether performing a separate start-up meeting for each package is necessary.

The call for meeting and meeting documentation are submitted some time in advance, allowing the project employees to familiarize themselves with the project, i.e. agenda, meeting participants and meeting enclosures. Important items are:

- Progress schedule with milestones
- Manpower requirements
- Design requirements
- Use of Siemens Offshore division standard tools and solutions
- Implementation of experience from previous projects
- Document control function
- Ordering routines
- Cost control
- Change handling

HSSE conditions and requirement for the job and experiences from previous projects are also discussed. Furthermore, possible grey zones are emphasized in the interpretation of responsibility matrix between the various project functions.

The minutes of meeting are stored in the project document control system. It also contains other items discussed in the meeting. Any unclear items are to be logged with responsible and time for follow-up. Project manager is responsible for preparing the report and the follow-up of open items.

### **2.2.4 Analysis of contract technically and commercially**

The project management must have a clear, consistent and complete understanding of the content of contractual obligations. This will enable the project managers to establish the necessary strategy, define actions and important measures to ensure fulfillment of both customer's expectations as well as Siemens expectations. The analysis should, as a minimum, include:

- Contractual elements such as Variations, Liquidated Damages, Incentives, Milestones
- Details on Warranty, Currency, Insurance and Financing
- Sub suppliers
- Scope of work
- Special technical requirements
- Site evaluations
- Risk and Opportunities
- Errors or Changes in Bid and Calculations

The main elements are to be communicated to the complete project team during the kick-off meeting.

### **2.2.5 Project Execution**

After the project start up meeting is finalized the project is ready to be performed. The project manager gets the resources from the line management, and

a CTR responsible is chosen to be responsible for cost, time and to lead the resources allocated to the project. The CTR responsible is normally an experienced engineer, who has the necessary qualifications and has the ability to report to the project manager.

The projects are executed according to the project plans. Deviations are reported to the project manager, who again reports back to the clients. The LCM project have many milestones to be kept and they are normally

- Document delivery
- Internal acceptance test dates (IAT)
- Factory acceptance test with clients dates (FAT)
- Hardware delivery
- Offshore installation dates
- Commissioning support
- Operation support
- Final documentation dates

The CTR responsible is responsible to check if there are any deviations on the delivery. If there is any deviation, the project manager is to be notified. The technical project manager could also be involved to determine if the scope change could lead to a variation order. If the change is due to fault in estimation or grey area in the contract, a negotiation with client is needed. If the cost is small Siemens will take that cost, and will add this to lesson learned and try to do a better estimate and sales bid. But if the cost is big, the client will accept to take the cost as a variation order due to the grey area in the contract after being presented with the reasons in a clarification meeting.

The milestones set in the startup meeting need to be realistic and attainable, as long as all necessary resources are available and purchased material arrive according to internal agreement with sub suppliers. If materials are out of stock,

or get delayed the CTR responsible needs to report to the project manager, who will determine if the project activities can be changed and check if this delay can result in the milestone not been attainable. The project manager will then inform the client of these challenges.

The project continue to deliver documentation according to contract, software-and hardware solution to the client and perform an IAT. Representatives from the client company participate in the FAT, and if the test result correspond with client specifications, the test report will be signed by client representative and the software and hardware solution are ready for offshore installation.

Before implementing the project offshore all necessary documentation and work description in the client system tool are approved by clients third party assessors. The project members from Siemens LCM execute the offshore installation according to their installation procedure, and get all necessary signatures from client representative offshore, and they are ready to assist the client with commissioning. If the contract does involve operational support, then some of the project members will remain offshore after commissioning as standby just in case the system requires some adjustments.

When commissioning or operation support is completed, what is left of the project is the completion of all documents. The final documentation is issued to the clients, and closeup of the project will commence. Demobilization of project members will follow. When all documentation is complete and accepted by client, the client will issue a completion certificate to Siemens.

### **2.2.6 Warranty**

The project finalization is followed by a warranty period. This period is stated in the frame contract. If the hardware or the software solution fails during this period, Siemens is responsible to handle and upgrade the system according to the client specification. Siemens can only dispute this if the client has used the system in a manner other than stated in the manual or in an inappropriate way.

# Chapter 3

## Risk Assessment

For Siemens risk assessment in project is important, it protects the business which for Siemens projects is a part of, it is also an avenue to comply with clients interest. Risk assessment helps to focus on the risks that really matter in the projects, the ones with the potential of causing harm. In many instances, simple measures can readily control risks, for example, ensuring use of standard tools and standard project execution techniques.

A risk assessment is simply a careful examination of what could cause harm to the business, so that management can weigh up what precautions to take and what steps to follow to prevent harm. Example on harm can be no profitability in the project, losing clients or losing a key employee.

All risks cannot be eliminated, but they can reduce the risk to a minimum acceptable level. Awareness of existing risk is crucial and identification of new risk is important. This is not the only way to do a risk assessment, there are other methods that work well, particularly for more complex risks and circumstances. However, one believe this method is the most straightforward for most organizations.

### 3.1 LCM Risk Assessment

Identification of hazards is important. Project risk is an uncertain event or condition which, if it occurs, has a negative effect on at least one of the project's objectives such as time, cost, quality or resources. Risk can be defined as uncertainty of outcome whether positive opportunity or negative threats. Some amount of risk taking is inevitable if the project is to achieve its goals. The project risks are assessed with the following questions

- What can go wrong in the project
- Is the project more complex than before
- Can it be delivered in time to satisfy clients needs
- Are the necessary resources available
- Can external factors inflict on the performance or quality
- Does the risks change over time, and are further assessments needed at a later stage of the project

Once the risks are identified they must be assessed according to their probability of occurrence and potential impact they may have. The probability is obtained from empirical data within the organization, and therefore assessment process is critical to make the best decision in order to properly prioritize the implementation of a risk management plan. The risk management plan is made using the PIMS risk management system.

The risk assessment in the LCM project begins during the estimation/sales support phase. Here the technical staff assist on pricing the project where they evaluate the technical challenges this project can have. The resource risks are not evaluated before the bid process are completed, and the project are included in a plan overview. During the start of the project other risk types are assessed, and the PIMS tool is used to log all potential risks.

### 3.2 PIMS R3

Siemens uses this tool for risk assessment and controlling. PIMS Risk Management is a database tool and PIMS R3 is the software visualization tool that supports the Siemens project risk methodology. The database is used to identify and assess risk, and the tool gives a graphical verification of risk, opportunity, consequences, probability and if its manageability. Figure 4.1 shown below is a snapshot from PIMS Risk tool graphical visualization

		CONSEQUENCE				
		Negligable 0<1%	Minor 1<4%	Moderate 4<7%	Major 7<10%	Huge >10%
PROBABILITY	Near Certain >80%	5	10	15	20	25
	Highly Likely 50<80%	4	8	12	16	20
	Likely 30<50%	3	6	9	12	15
	Unlikely 10<30%	2	4	6	8	10
	Highly Unlikely 0-10%	1	2	3	4	5

Figure 3.1: PIMS Risk tool graphical visuatzation

The tool can be used to assign actions, ownership and deadlines, and to create reports from projects with a set of custom built reports. The objective for the PIMS Risk tool is to:

- Identify risk
- Evaluate risk
- Assign actions

### **3. Risk Assessment**

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- Assign responsibility
- Monitor
- Get reports



# Chapter 4

## Risk management and discussions

In this chapter risk management in the projects is discussed. The discussions are based on case interviews with project members. The project members are a mixture of engineers, technical project managers and project managers.

### 4.1 Introduction

Some of the participants on the case survey use the risk management tool PIMS. They are primarily project managers and technical project managers. The PIMS tool is used especially during a start up meeting, to analyse what risks have been identified in the project that can impact the client. The PIMS tool is also used for analyse risks that can impact Siemens interests, and they are handled by the project management.

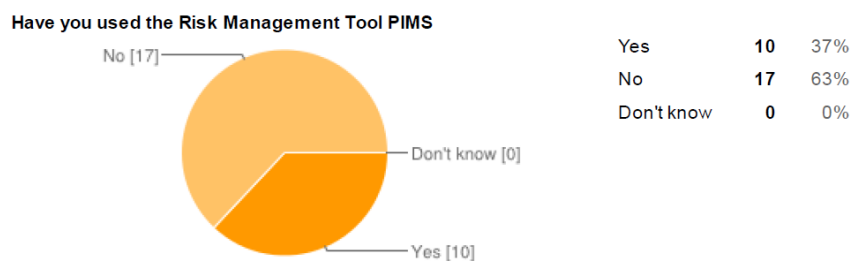


Figure 4.1: PIMS Tool

## 4. Risk management and discussions

Estimation and sales support is primarily done by technical staff. The project managers, technical project managers and lead engineers assist the sales department to clarify technical details and estimate the time usage and cost of the project. When there are many projects ready for bid, sometimes less experienced technical staff assist and the estimation could be inaccurate.

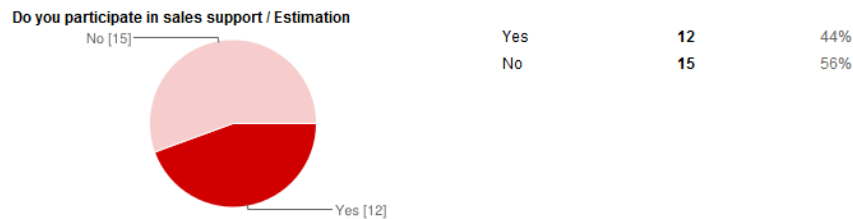


Figure 4.2: Sales Support

The engineers do feel that the risk assessment and management are at an acceptable level, but they feel it can be improved, especially in the area of resource and time management. There are times when there are more projects than manpower, this can put pressure on the project members. This results in a situation where the project members are moved from a project to another more important project, then they need to work more overtime to reach the milestones. This can cause some unrest in the project organization.

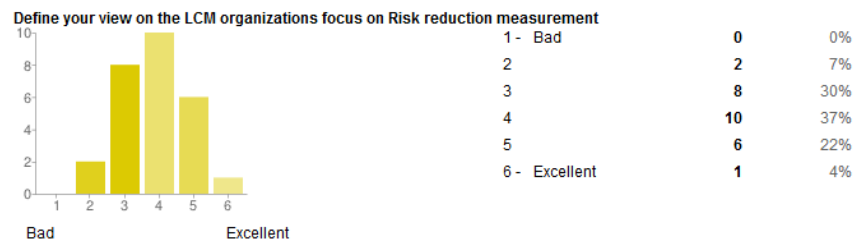


Figure 4.3: Risk Reduction

LCM representatives who attend the start up meeting with clients are mainly project manager, technical project manager, project controller and lead engineers (CTR responsible). The rest of the project members do not attend the

start up meeting.

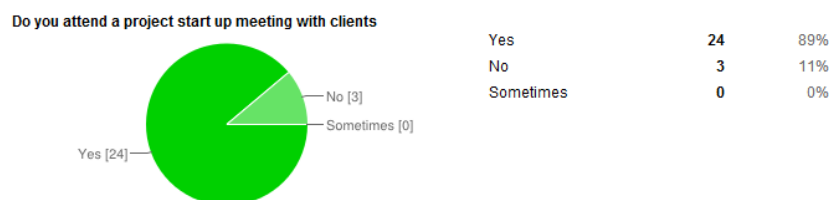


Figure 4.4: Startup Meeting

The project management have a risk assessment meeting with lead engineers. The engineers have a technical review meeting where the technical issues of the project are discussed and handled. This combined effort covers all the risk assessment and management.



Figure 4.5: Risk Workshop

During the startup meetings in CTR's the risks are highlighted. Risk workshop is part of startup meeting and minutes of meetings.

## 4.2 Risk and Opportunities

The LCM project members have responded to the survey that the risk awareness in the organization is high. This can be explained by the high focus the organization has on the risk management during the projects. The LCM has many quality gates where they can monitor the stages of the project, and these therefore help to detect gaps in the quality assurance of the projects.

## 4. Risk management and discussions

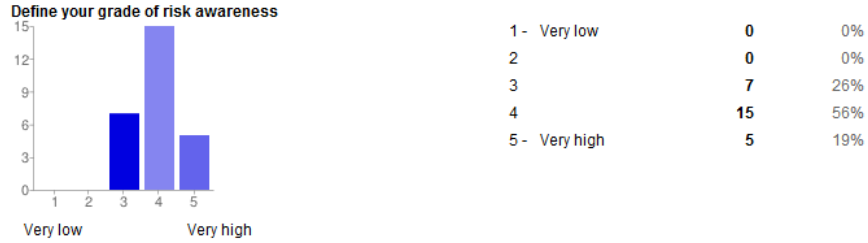


Figure 4.6: Risk Awareness

The project members also voiced the opinion that the risk opportunities within the organization is good. Opportunity occurs when e.g. the project gets canceled and the manpower resources are available to other projects.

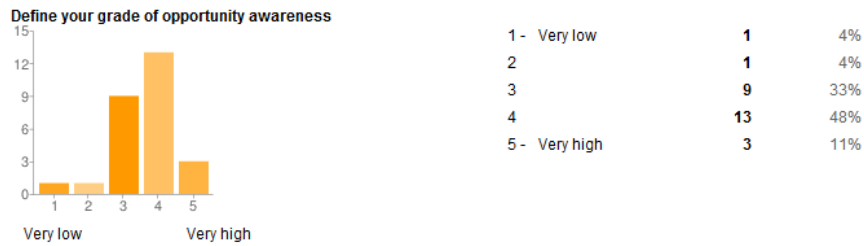


Figure 4.7: Opportunity Awareness

Project members answered in the case survey that they are active in suggesting better risk reduction measures. When the projects are ending, the lesson learned session is an important agenda for these suggestions. The most important aspect of this is the willingness of the project members to give their view of what can improve.

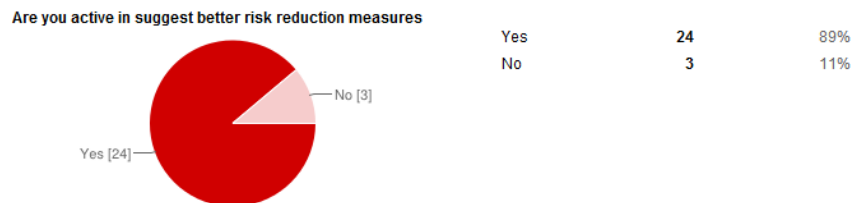


Figure 4.8: Risk Reduction Measures

## 4. Risk management and discussions

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Many of the projects have resulted in costing more than estimated. These have many of the same reasons for time delay. Projects cost more due to extended work, as a variation order. Non conformance work has more cost (fault which can not be billed to clients). Variation order request from Siemens gets rejected by client (disputed variation order). Experience and knowledge are not available as anticipated. Lead engineers were not available for certain projects. Additional work which is in a grey area in the frame contract. Additional work/discussion or clarifications coming from the operation departments in the client companies.

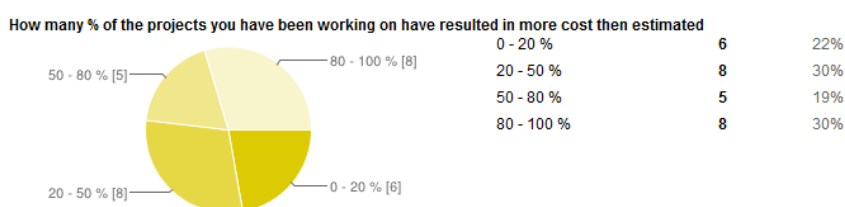


Figure 4.9: Project cost more than estimated

According to the survey, many of the projects are delayed. The reason for this are multifarious. Most of the time there are delays to the delivery of design specifications from clients. But it can also be that the estimation of the work was not precise. Documents sent for approval use more time than agreed with client. Necessary resources were not available due to other important projects. Variation orders also delay the projects, as well as operational causes on the offshore plants. Some of the projects are modifications on the same plant. This involves modifications on the same hardware and software solution, this can cause conflict of interest between the projects. Here the client should prioritize one of the projects.

Common causes for variation orders to be created are:

- Demands have changed from the beginning of project start-up
- The client or project members discovers obstacles or possible deficiencies that require them to deviate from the original plan

## 4. Risk management and discussions

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- The customer or project members are inefficient in completing their required deliverables within budget. time, funds or resources
- During the course of the project, additional features are perceived and requested.

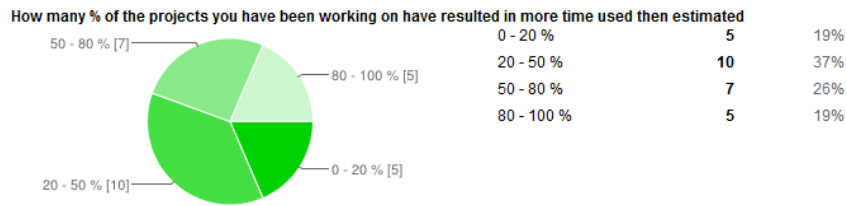


Figure 4.10: Project time more than estimated

The offshore risk analysis is handled well. If the project members are slightly unsure of their tasks, its common that they request a safe job analysis (SJA). This is an analysis of all aspect of the offshore installation work. All the work force work together and go through all the work tasks, and try to evaluate which part of the job are hazardous. Those hazardous parts need to be handled with compensatory measurements.

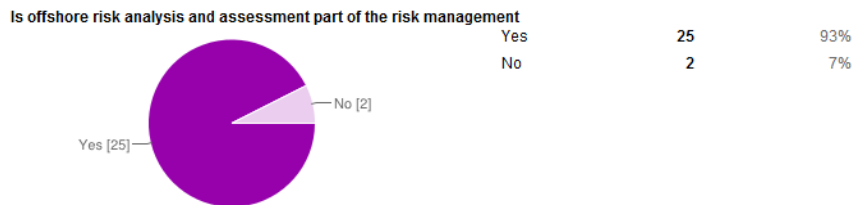


Figure 4.11: Offshore risk analysis

The project members do not feel insecure when traveling offshore to perform the offshore installation. Inexperienced project members travel with more experienced personnel, so that the offshore plant system is not unnecessarily exposed to more risk and the new resource gets a proper offshore start-up and HSSE awareness.

## 4. Risk management and discussions

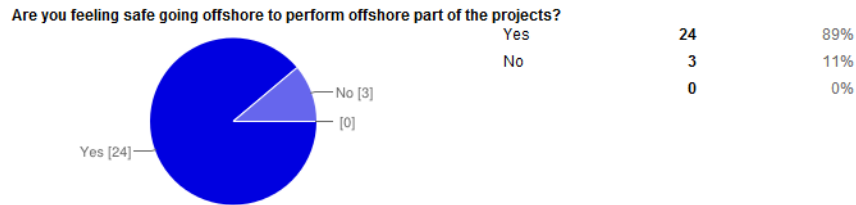


Figure 4.12: Safe to perform offshore implementation

The offshore risk assessments are handled very well. Assessments are done early in the project phase and upon preparation for offshore installation. Risk assessment offshore is mainly done together with client and operator of the offshore plant. Here all potential risk aspects of the work are evaluated. A hazard and operability (HAZOP) is sometimes executed to identify and evaluate problems that may represent risk to personnel or equipment. Figure 4.13 shows response stating mainly all projects assess offshore risk.



Figure 4.13: Offshore risk assessment

The main risk assessed is manpower management. Due to lack of engineers in the market and workload increase, the LCM managers uses more time to get human resource from the line management. Access to lab facilities is also assessed. To get all necessary documentation from clients and sub suppliers is also a risk factor. This can cause delays in the parts of the project activities. When you also have a situation where there is a lack of technical personnel there is the risk that the ones available can be head hunted and seek assignment in other companies. This can cause a gap in knowledge and experience. Another possible risk arises when a new employee arrives and the line management doesn't supply this new employee with the necessary training.

## 4. Risk management and discussions

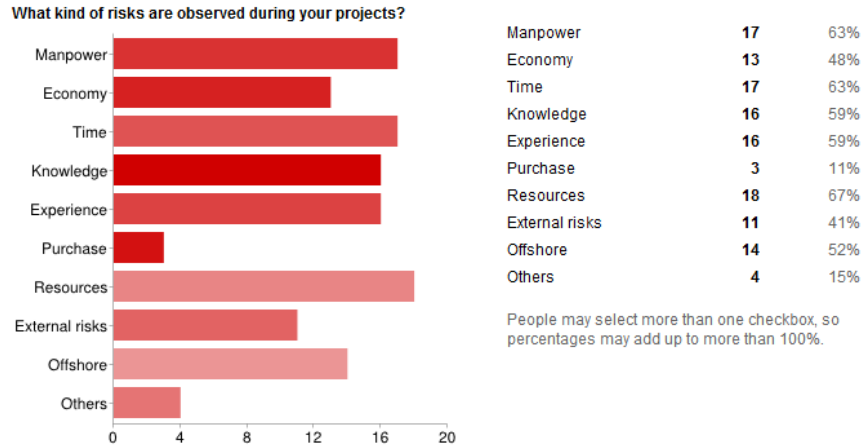


Figure 4.14: Risk identifications during projects

The project members also responded that they feel that the organization understands the importance of risk management. The organization knows it's important to identify the risk, and respond to them with strategies. Some of the strategies are to exploit the risks, avoid them, transfer risks, mitigate, share or accept the risks. The project members understand the principles of risk management and have a sense of ownership. It is important that the project members agree on the methods and tools for handling threats and the take necessary action to eliminate them .

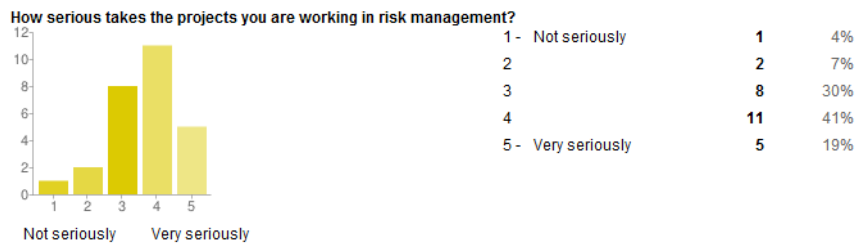


Figure 4.15: Seriousness of projects when it comes to risk management

Exploiting a positive risk is a good way to take opportunity of a risk. Risk can be shared with a third party, e.g. frame contract excludes offshore as reimbursable cost or taking out insurance to cover certain risks. The answers in the



## 4. Risk management and discussions

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survey state a high focus on opportunity within the organization.

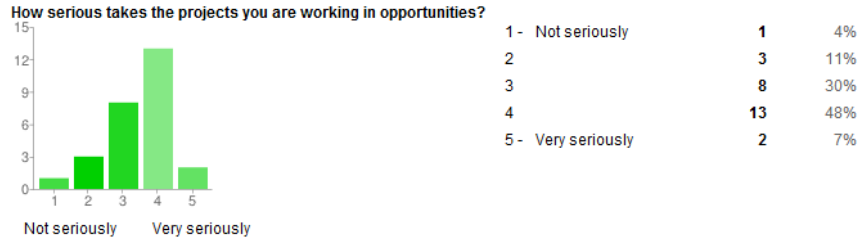


Figure 4.16: Seriousness of projects when it comes to opportunity management

The risk and opportunity awareness within the organization are high according to the answers. As discussed earlier, high focus on risk management is crucial to the organization, in reducing cost, delivering quality and acquiring new contracts from the client.

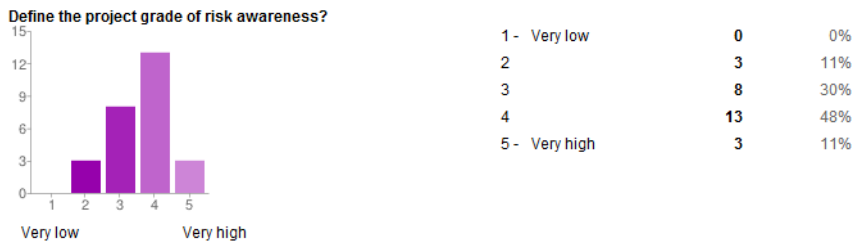


Figure 4.17: Risk awareness in projects

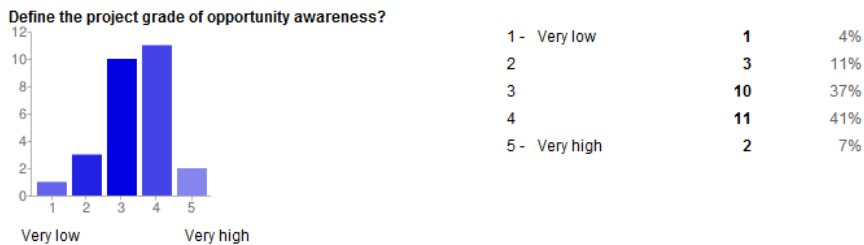


Figure 4.18: Opportunity awareness in projects

### 4.3 Culture

The company’s culture sets the tone for the organization influencing the consciousness of it’s staff ability to exert control. This is the foundation for all other components of internal control. Figure 4.19 shows the result for the question about the ethical standard. The project members response states that they feel that the ethical standard is quite high at the company.

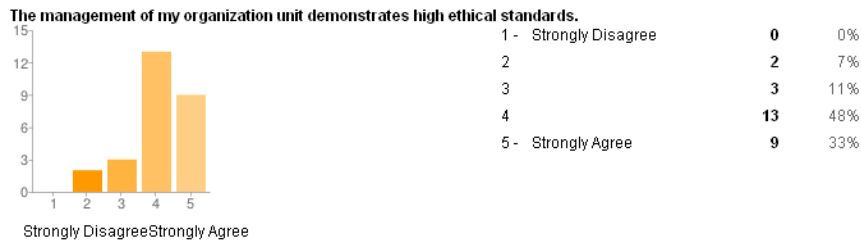


Figure 4.19: Ethic standard

The project management comply with internally regulations, and also with regulations from clients and third party such as the governments requirements for the business unit.

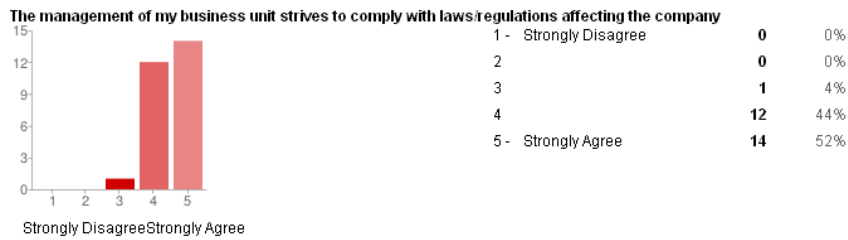


Figure 4.20: Compliance with law and regulations

The project member responded to the survey that they feel their work is realistic and obtainable. Some who disagree on this have less experience. This can be due to high workload and lack of prioritization of training.

When there is more work than manpower, there will be more work per person. New employees could be introduced to the LCM project team, and this can

## 4. Risk management and discussions

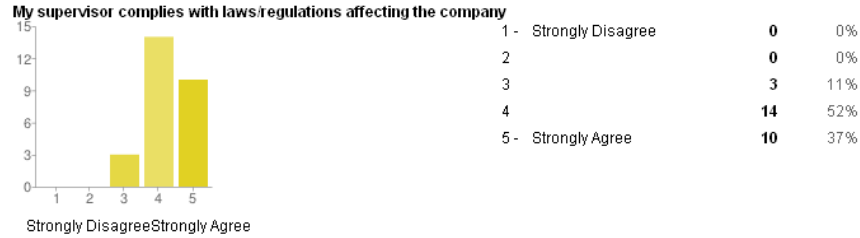


Figure 4.21: Supervisor's ethical standard

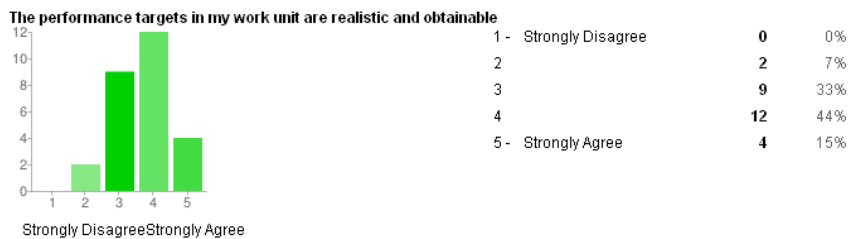


Figure 4.22: Performance targets realistic and obtainable

cause unrest affecting project results.

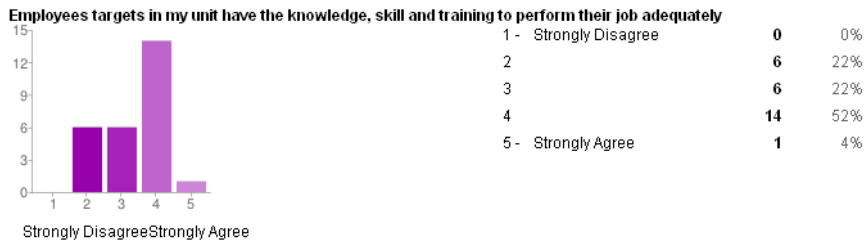


Figure 4.23: Employee targets

Lessons learned on the projects are summarized in the project closeup meetings according to quality guidelines in the organization. The project members feel that past mistakes are not addressed and learn from. This can be due to not much focus on competence transfer. Writing down the lessons learned in one project closeup minutes of meetings is one thing, another thing is to be able to communicate these lessons to the rest of the organization. A good way would be to take up the minutes of meeting in the startup meeting of new project and evaluate if something can be learned in advance before starting the new project.

## 4. Risk management and discussions



Figure 4.24: Department mistakes

Personnel turnover is not very high. When projects are awarded to Siemens, more manpower resources may be required. There are therefore many new employees who are not familiar with the organizational rules, and the technical aspect of the project. In a team, the project members work together. New personnel will require more time, and figure 4.25 shows many disagree that their work is not affected by personnel turnover.

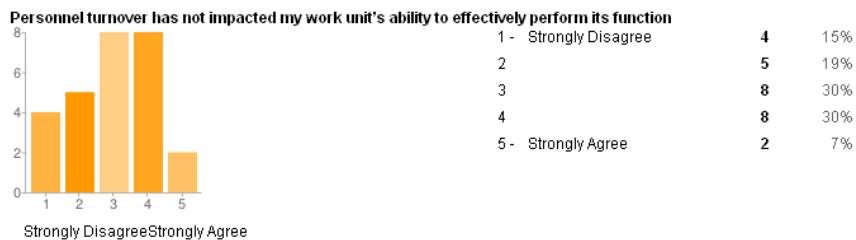


Figure 4.25: Personnel turnover

The financial results are important to the company as a business. But it is equally important to have good business relationships with clients and develop new technology for the future so that one remains competitive. Other aspects are also important as environmental awareness and good relations with its employees.

The response in the case interview shows that the project members feel they have a good work environment. They do not need to take any unnecessary risks in performing their work.

## 4. Risk management and discussions

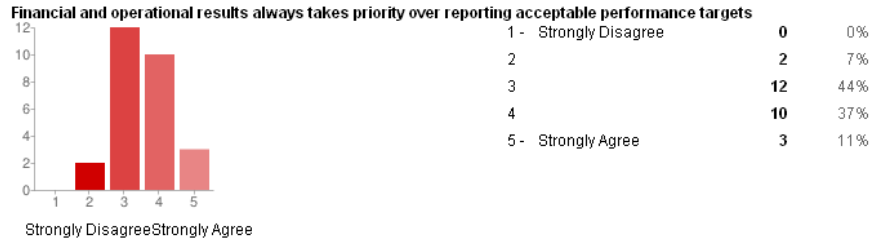


Figure 4.26: Financial and operational results

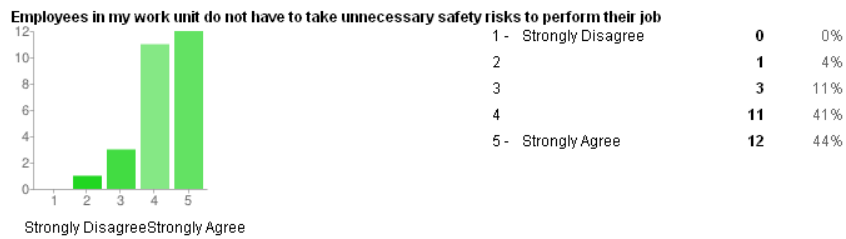


Figure 4.27: Unnecessary safety risks

## 4.4 Goals and Obstacles

Resource management could be better. Many of the project members are reporting that some projects are not fully resourced to complete project tasks on plan. Figure 4.28 shows results from the survey about sufficient resources. The answer mainly states that projects are running with sufficient resources, but not always.

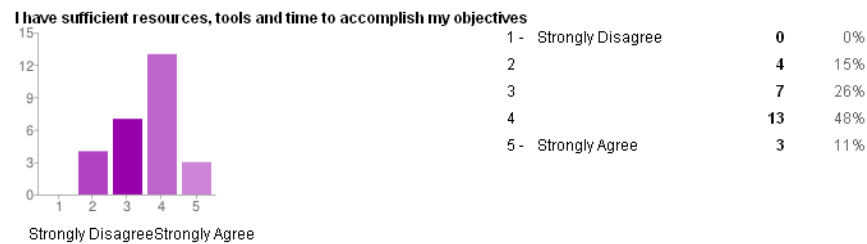


Figure 4.28: Sufficient resources

Figure 4.29 shows the response regarding the LCM organization's ability to support new products, technology and services. The surveyed participants feel they get support from the management regarding this matter. This shows that the

## 4. Risk management and discussions

LCM department succeeds in communicating its vision to its employees, to be a pioneer in electrical technology invention.

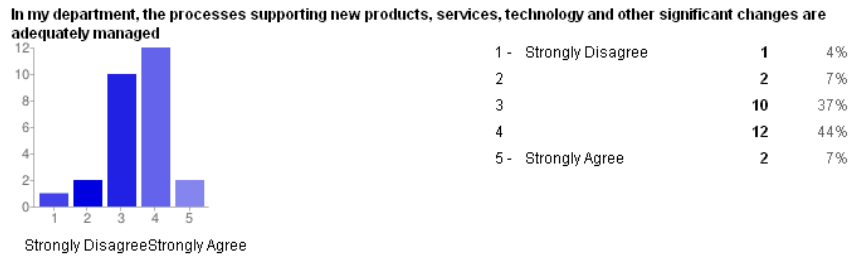


Figure 4.29: Management of new technology

Barriers and obstacles are important to identify early. Especially those that can have impact on achieving the objectives of the project execution. Obstacles and barriers are such as quality assurance on project execution. Figure 4.30 shows answers stating that the identification of barriers and obstacles is good in projects.

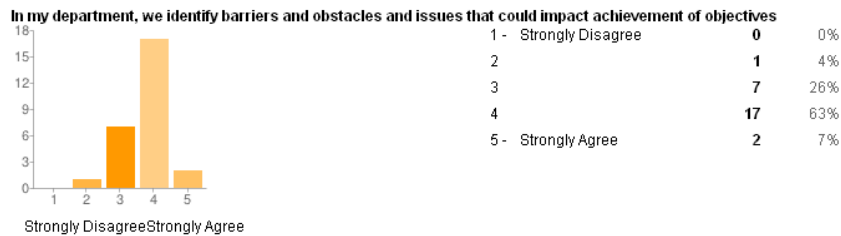


Figure 4.30: Identification of barriers and obstacles

Customer impact decisions can change project execution. Its important to have a flexible organization to handle client change in e.g. earlier delivery than planned. Client can give incentives for early delivery or push in additional or particular project. The LCM organization has a rapid response team available to handle such requests. Figure 4.31 shows survey answer in respond to the question about client impact. Here they answer that the organization has a backup resources to handle such impacts or requests.

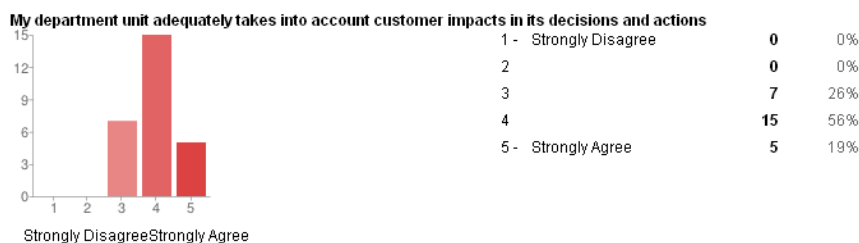


Figure 4.31: Customer impacts on decisions and actions

## 4.5 Policies and Procedures

Policies, procedures, and other safety measures help to ensure that objectives are accomplished. Project execution procedures are stored on the quality management system in the SOGO intranet. Also business process management (BPM) is available in the same intranet. Part of the LCM organization also has a special project execution handbook, called Engineering Handbook (EHB). This EHB describes all steps in plant modification projects, both hardware and software solutions. Figure 4.32 shows the result of the survey for this. Most of participants of the survey answer that they feel policies and procedures do allow them to do their work effectively. Some are not fully satisfied. It could be because these are many customized project execution procedures for different clients. E.g. project execution on Statoil plant Statfjord, can differ from ConocoPhillips plant Eldfisk. Also those between same client can differ, e.g. Snorre and Statfjord. For LCM its not easy to standardize the project execution procedures, due to strong client opinion. Client from some company, but from different organization have different ways of running projects. So LCM project members need to get familiarized themselves with procedures on whichever offshore plant they are working on. This can be inefficient if experienced personnel are allocated to new offshore plant.

All project activities have milestones. In the milestones, there are quality gates. Breaking the procedure and laws should be discovered. Most of the answers in the survey states that procedure violations are discovered. However some disagree, without mentioning a reason for this.

## 4. Risk management and discussions

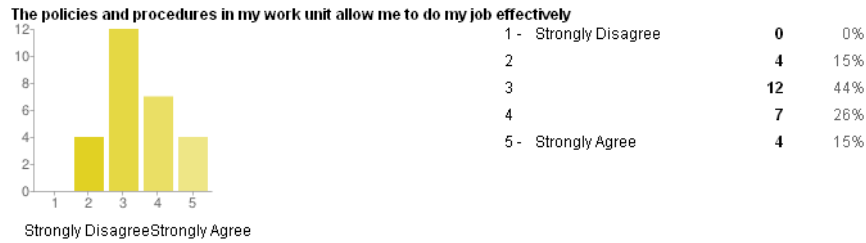


Figure 4.32: Policies and procedures

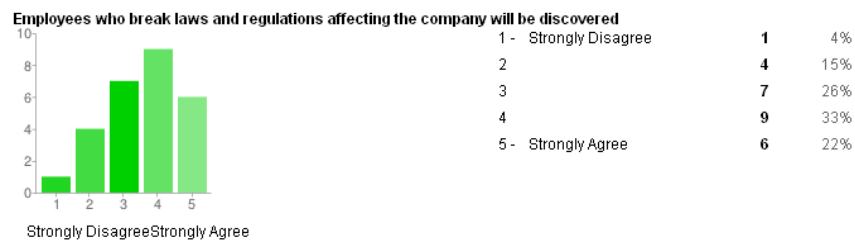


Figure 4.33: Discoverable of procedure breakers

Employee who break the laws and regulations affecting the company are discovered and are subject to consequences.

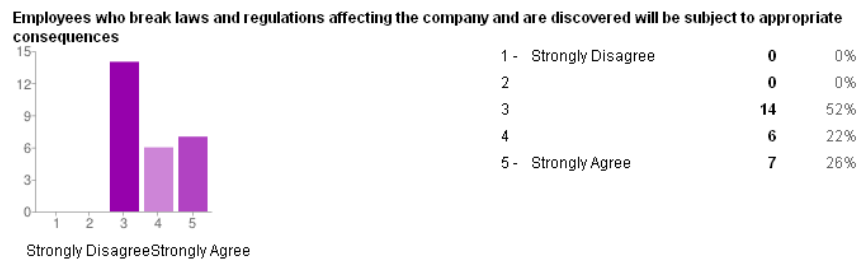


Figure 4.34: Consequences of procedure breaking

## 4.6 Information and Communication

Pertinent information must be identified, captured, and communicated in a timely manner in order to enable people to carry out their responsibilities. A well thought out communication strategy is a success factor in a successful project. Good communication creates value in the project and will help a clear project



## 4. Risk management and discussions

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structure, a stronger project and give better and clearer results. Figure 4.35 shows answers in the survey that states good communication within the organization.



Figure 4.35: Performance reporting

Siemens generally have a system of reporting quality improvements. These reporting have incentives. The incentives are collective incentives, such as company bonuses, team building and prize money to the local social group.

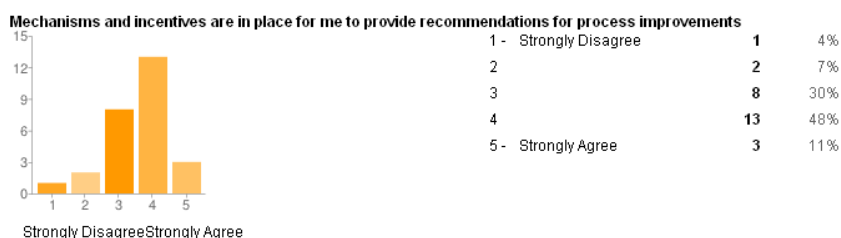


Figure 4.36: Improvement incentives

The CTR responsible handles the day to day project activities, and reports to the project manager for progress and any difficulties. This ensures that the project worker is fully focused in executing their tasks efficiency. The smallest project could be a one man project, where the CTR responsible is also executing the project tasks.

Information across department boundaries could sometimes not be delivered. Communication with other locations like Bergen and Oslo, could improve. Important findings in LCM projects executed in Bergen arrives sometimes late in

## 4. Risk management and discussions

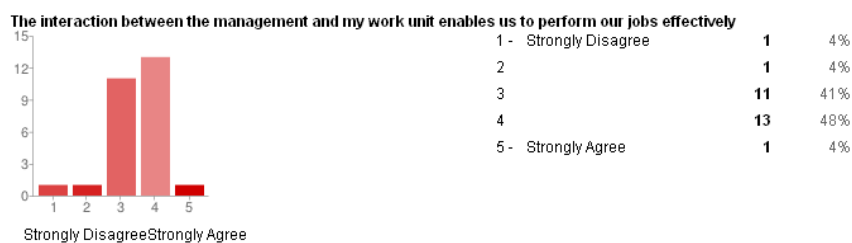


Figure 4.37: Interaction between management and employee

e.g. Stavanger or Oslo. This should be avoided.

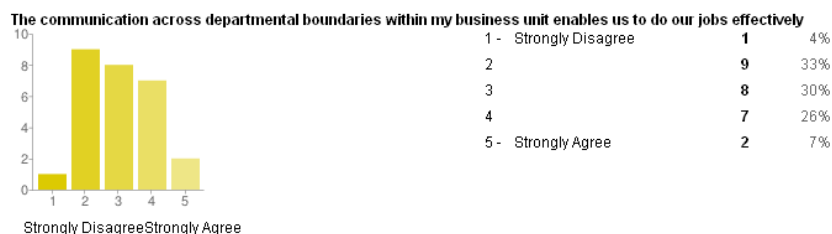


Figure 4.38: Communication across department boundaries

All communication towards the client company should be through the official communication lines. Siemens use document control tool to log all official communication with its clients. But using the these lines is ineffective and slow. Technical queries may a take couple of days to process in the document control center. Therefore some of the project member use informal communication lines such as email, to get a quicker response. Meetings are also used, and minutes of meetings are stored in the document control tool.

The CTR responsible distributes information from project manager and from client to the project member who needs the information to perform a task. The survey indicates that project members get the information they need to perform their work. It is important to have the right information to avoid non conformance later in the project phase.

Again the CTR responsible monitors and reports progress and performance to

## 4. Risk management and discussions

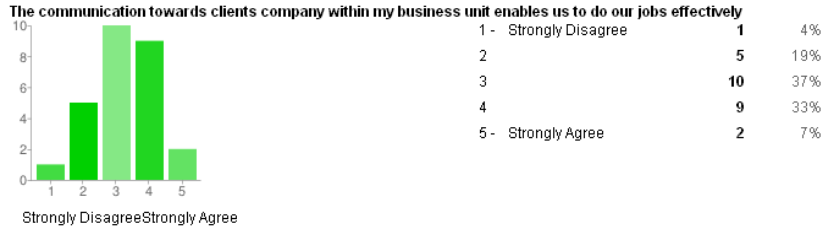


Figure 4.39: Communication towards clients company

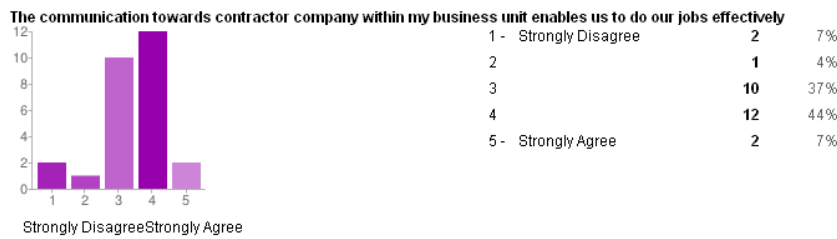


Figure 4.40: Communication towards contractors company

the project manager. This will again be reported back to the clients in a weekly or monthly report.

It is important to report any suspected improprieties. The answer in the survey states that the LCM organization has open communication lines in this matter. The person who reports any improprieties is also protected. A person is also confident that if a wrongdoing is reported, that the supervisor will take action and the wrongdoing will stop.

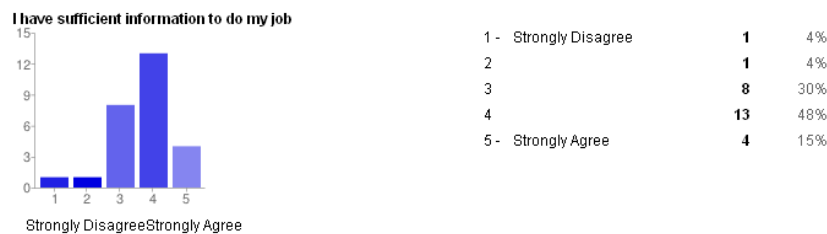


Figure 4.41: Sufficient information

## 4. Risk management and discussions

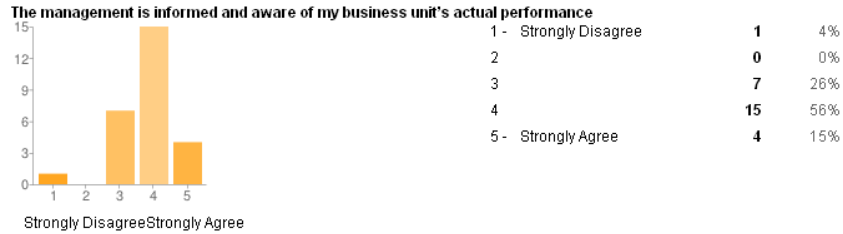


Figure 4.42: Management awareness of performance

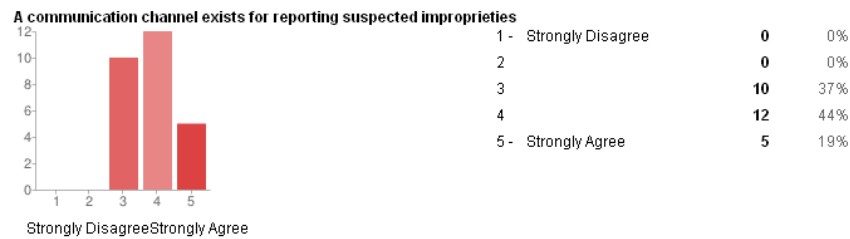


Figure 4.43: Existence of communication channel for reporting suspected improprieties



Figure 4.44: Protection of personnel when reporting suspected improprieties

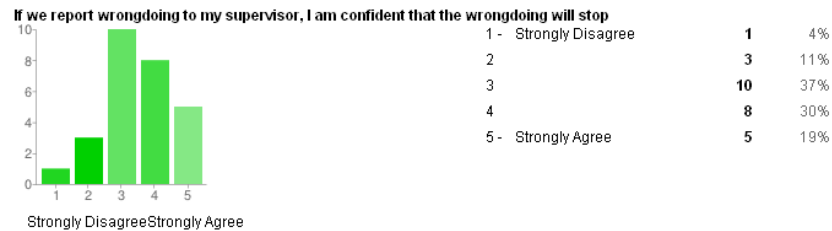


Figure 4.45: Confident of reporting wrongdoing to my supervisor

## 4.7 Evaluation and Feedback

Information about customer satisfaction or dissatisfaction is important to know. How is the work going? Could something been better? Answers to such questions are vital to know. Figure 4.46 shows feedback is not always provided to the project members.

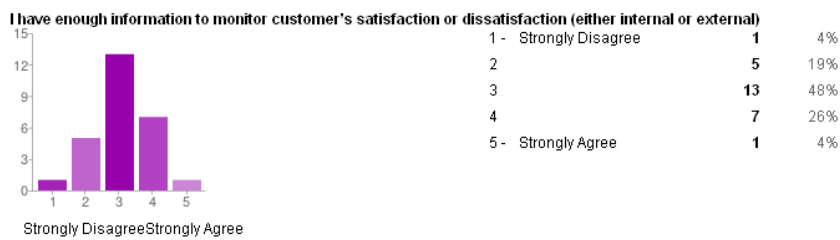


Figure 4.46: Customer Satisfaction

Feedback such as complaints from client are important matters to address. Clients satisfaction is vital for the business. To follow up the complaints and feedback are crucial. If the client is dissatisfied, future bids for new projects may not be successful for this reason. From the survey, the project member states that client complaints are not always followed up effectively. This can be due to a disagreement on the complain.

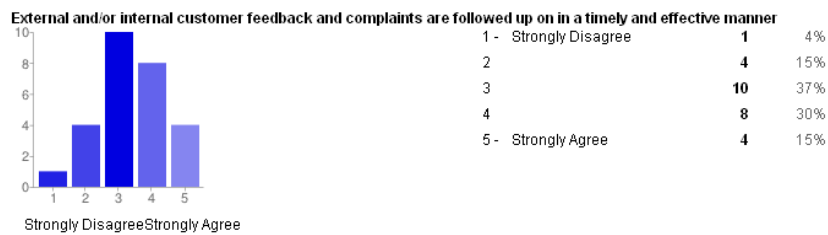


Figure 4.47: Follow up with customer feedback

Technical reviews and quality gates in different parts of the project life cycle ensure the quality of the project tasks. The members answer in the survey that their work quality is reasonably measured.

## 4. Risk management and discussions

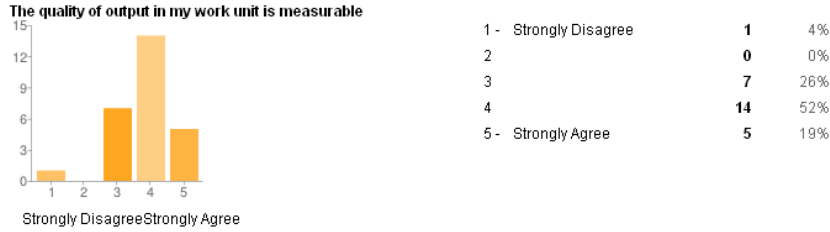


Figure 4.48: Quality of work measurable

Mistakes or gap in the project performance should be reported to the project management. For every CTR, the CTR responsible should be in dialog with the task performer and report to the project manager about findings related to quality. The project members answer in the survey that actions are taken when such incidence occur.

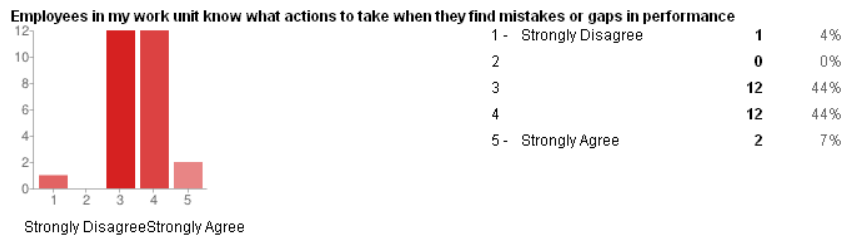


Figure 4.49: Action taken if gap in performance

One of many tasks for the CTR responsible is to review the performance at appropriate intervals. This also replies to the project manager who reviews the performance of the CTR responsible at appropriate intervals. Figure 4.50 indicates answers from the survey which shows a slightly high level of reviews on the performance of the project members.

There are no companies are immune from the risk of unethical conduct or fraudulent activities. In according to Siemens regulations, all employees are responsible in taking action when these situations are suspected or occur. Siemens does not tolerate this and takes the appropriate action against unethical conduct

## 4. Risk management and discussions

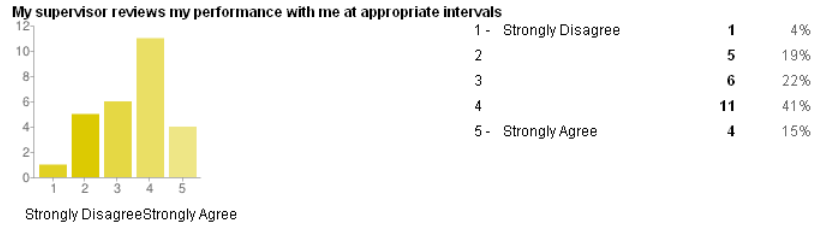


Figure 4.50: Supervisor review of performance

or fraud whether perpetrated by employee, clients, suppliers or buyers of Siemens products or services. Figure 4.51 shows answers from the survey where the project members stated they know what action to take if such activities are known to them.

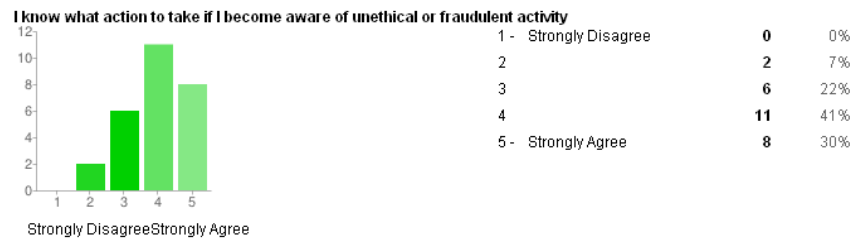


Figure 4.51: Awareness of unethical activity

# Chapter 5

## Conclusions

The risk management at Siemens life cycle management is a difficult task. This is because of all outside influences the organization has to face. Since LCM is dependent on clients work description or specifications, the deliveries of these can be delayed and this can result in more risk of completing the project later than expected. The clients are demanding and sometimes are very interested in getting much work done in a shorter period of time. Due to this it is much more difficult to keep focus on risk management.

### 5.1 Communication and prediction

There are different techniques that can be used to reduce the external risk factor. Although there are many management meetings held with the clients, communication and more detail planning would help to predict future work. This can help with the planning of future projects as well as with gathering the project team which has the necessary experience and knowledge to execute the project according to plan and budget. Also, information about findings in LCM projects executed in other locations should be communicated better.



### 5.2 Resource management

From the survey many of the respondents stated that resource management could be better. The LCM managers are using too much time in acquiring manpower from the line management at the right time when needed. A close cooperation between line management and LCM managers is important for the organization. A smarter resource allocation between the projects where there are experienced personnel together with less experienced personnel forming a project team. In this way one can eliminate the shortage of experience in the projects.

### 5.3 Time and cost

The response in the survey shows high level of deviation from plan and budget in the projects. The project members states that many of these are due to change orders, rather than non conformance. The reason for so many change orders is mainly due to design change from the client after design freeze has passed. Delays are also common, due to offshore related reasons. Since the operator companies are highly dependent on high oil production, some modifications are postponed due to the requirement to shutdown the oil production to perform such works. There are also some non conformance issues caused by inexperienced project members doing work which is new to them, or lack of training provided from the line management.

### 5.4 Competence and knowledge

The line management is responsible for keeping a record of the knowledge and the experiences of their employees. The LCM asks for a resource with a certain level of knowledge and experience. Since the line management are responsible for this, the risk of getting a resource who can go to LCM projects has to be assessed. Here there should be a better cooperation within the Siemens organization, so that knowledge of the employee is well documented. The line management is responsible for knowledge building through courses and training. Such informa-

tion should be available to all LCM managers so they can ask for the resource which matches their project. A knowledge database with e.g. CV, course certificates and plan for the future for the employee should be updated by the line management and LCM managers should have access to read and review this.

### 5.5 Lesson learned

Putting more efforts into lesson learned from projects is important. Identification of what went well and what did not is useful to have so that this can be applied to future projects, especially similar projects. A session of lessons learned after the project is finished could be a good way to evaluate the performance. For new project its also good to remind the project team the lessons learned in the startup meeting of the project. Evaluating what can be improved will help to reduce risks and encourage a more effective execution of projects. Mistakes cost time and money as well as inefficient use of resource. Such resources could have been used by other projects, rather than working on e.g. non conformance tasks.

### 5.6 Recommendations

Resource management routines must be improved to have an effective resource management. The solution is not always to hire more employees. More planning with prognosis of work load can help to have an effective resource management.

Knowledge building measures and training of employees will reduce non conformance and make projects more profitable. The process system in LCM includes vision, design, execution, monitoring, and optimization. Its also important to make an "Engineering Handbook (EHB)" which describes the typical project execution methodology for different types of LCM projects on the different oil installations. Some departments in LCM have a good EHB, but others don't. Its important to use some resources to create an EHB for all departments in LCM, and to add them to the LCM project execution system and make it available for everyone on the intranet.

## 5. Conclusions

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The LCM should exploit more sales opportunities in the market, e.g. introduce new techniques and products to the clients.

Transfer of knowledge within the organization is vital. A mistake in one project, must not be repeated in another. This could help on the efficiencies in the challenges on resources, plan and budget.

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