


# Risk Management System

## CO<sub>2</sub> CAPTURE FACILITY

### KARSTO, NORWAY

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**Attachments**

1	Risk Identification form
2	Risk Analysis BEFORE Response Measures form
3	Risk Response and Monitoring form
4	Risk Analysis AFTER Response Measures form

## **1.1 INTRODUCTION**

This document describes the Risk Management System that will be used on the CO<sub>2</sub> Kårstø project.

## **1.2 PURPOSE**

The Risk Management System documents the following:

- Risk Management meeting
- Plan for documenting risks (Risk Identification)
- Risk analysis BEFORE response measures
- Risk response and monitoring
- Risk analysis AFTER response measures
- Plan for establishing and updating the Risk Register
- Preparation of the Risk Management Document
- Administration of the Risk documents

## **1.3 SCOPE**

The establishment of a new Carbon Capture and Compression facility involves a degree of risk in terms of cost, progress and performance. It is important that all possible risks that might affect the technical design, schedule, contract value, quality or scope are identified as soon as possible in order that such risks can be evaluated and appropriate risk responses including mitigation actions and contingency plans are developed.

This document describes the plan for identifying the risks, the approach to risk analysis and developing the responses.

#### **1.4 Risk Management Meeting**

The project will conduct weekly Risk Management meetings chaired by the Project Manager or Assistant Project Manager. All department supervisors and engineering group supervisors or their deputies shall attend this meeting. The agenda for the meetings will be as follows:

- Review newly identified risks (see 1.5 below)
- Review and provide input to the analysis of risk BEFORE response measures (see 1.6 below)
- Identify person responsible for completing the Risk Response and Monitoring form (see 1.7 below) for newly identified risks. Add name to the Risk Register along with schedule for completing the form.
- Update Risk Register with newly identified risks (see 1.9 below)
- Update the Risk Register with information on previously identified risks including:
  - Review updates to the Risk Response and Monitoring forms for previously identified risks.
  - Review and provide input to the analysis of the risk AFTER response measures (see 1.8 below)
- Update the Risk Register (see 1.9 below)
- Review of status of Risk Management Document (see 1.10 below)
- Identify which Risks need to be included in the monthly report

#### **1.5 Plan for documenting risks (Risk Identification)**

It is important that as many risks as possible are identified as early as possible throughout the project development. This includes but is not limited to risks related to engineering, manufacture, supply, assembly, erection, commissioning and operation (technical/quality, costs, time, schedule etc). To facilitate this we have developed a simple, 4 stage process of identifying and documenting risks as follows;

Stage 1: All project team members are encouraged to identify risks on a risk identification sheet that will be placed in a 'risk management' folder on the project share drive (see attachment 1). Risk shall be identified on this sheet even if only part of the information requested can be given (the additional information can be completed after discussions with the supervisor or after input from the Risk Management meeting). Team members are encouraged to identify as many

risks as possible, including risks outside of their area of expertise – there are no negative impacts for identifying a risk. A copy of the completed risk identification sheet shall be forwarded to the employee's supervisor for review.

Stage 2: Supervisors will review the information on the sheet with the employees with the aim to maximize the information available on the risk and possible mitigation options to the extent possible. In cases where the risk item falls outside of the area of expertise of the supervisor, the supervisor shall contact their counterpart in the relevant department to provide the appropriate input to the sheet. The sheets will be updated as needed. Any perceived significant risks will be brought to the attention of the Project Manager and Assistant Project Manager immediately.

Stage 3: Supervisors will bring a copy of all risk identification sheets to the weekly risk management meeting. The newly identified risks will be reviewed in detail at the meeting at which point they will be added to the Risk Register (see section 1.9 below)

## **1.6 Risk Analysis BEFORE response measures**

Once supervisors have completed their review of the Risk Identification sheets they shall work with their project team member to analyze and quantify the risk. This includes estimating the probability of occurrence, estimating additional costs for the project, impact on schedule and Effect on reputation (if applicable) and Physical Integrity impact. They shall do this using the sheet titled "Risk Analysis BEFORE Response measures" contained in attachment 2.

Supervisors shall bring a copies of this sheet to the weekly Risk Management meeting for review.

## **1.7 Risk Response and Monitoring**

The person responsible for identifying the risk response strategy and monitoring the risk will be identified in the Risk Management meeting. This person may be assigned team members to assist in developing the strategy depending on the significance of the risk item. The form contained in attachment 3 shall be used for the Risk Response and Monitoring. The schedule for completing the form will be included in the Risk Register.

### **1.8 Risk Analysis AFTER response measures**

Once the Risk Response measures have been identified the person responsible for developing the response shall work with the relevant department supervisor to complete the Risk Analysis AFTER Response Measures. This includes estimating the probability of occurrence, estimating additional costs for the project, impact on schedule and Effect on reputation (if applicable) and Physical Integrity impact. They shall do this using the sheet titled "Risk Analysis AFTER Response measures" contained in attachment 4.

Copies of this sheet shall be brought to the weekly Risk Management meeting for review.

### **1.9 Risk Register**

The Risk Register shall include the information listed below. The document shall be updated weekly at the Risk Management meeting or in-between the Risk Management meeting if significant Risks are identified in that period The Project Controls supervisor shall be responsible for updating the Risk Register. Items that will be included in the risk register are:

- Risk item #
- Risk Description
- Risk actions
- Start and end date for each action
- Risk responsibility
- Status of each risk

### **1.10 Risk Management Document**

The Risk Management Document will contain the all the updated information outlined in sections 1.5 through 1.9. This will be dynamic listing of project risks that will be updated during the course of the project and will be formally issued to Gassnova at milestone M6.

### **1.11 Administration**

The Risk Register and Risk Management Documents will be placed in the project Infoworks doabase. Revision numbers will be issued with each new revision of the documents. The Risk Management Document will be issued to Gassnova in accordance with the requirements of Exhibit A, Appendix A1.

The Assistant Project Manager is responsible for oversight on the Risk Management system.

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Attachment 1:

<u><b>Risk Identification</b></u>	
Category (select one)	<ul style="list-style-type: none"> <li>• Technical</li> <li>• Commercial</li> <li>• Environmental</li> <li>• Organizational</li> <li>• Force Majeur</li> </ul>
Description:	
Cause:	
Effect:	
Comments:	
Affected components of plant	
Affected parties	



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Attachment 2:

<b><u>Risk Analysis BEFORE Response Measures</u></b>	
Probability of occurrence	
Assumptions	
Additional costs for the project	
Impact on Schedule	
Effect on reputation (if applicable)	
Physical Integrity impact	

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Attachment 3:

<b><u>Risk Response and Monitoring</u></b>			
Mitigation Strategy	<ul style="list-style-type: none"> <li>• Avoid</li> <li>• Transfer</li> <li>• Reduce</li> <li>• Accept</li> </ul>		
Estimated mitigation cost			
Mitigation description			
Mitigation status			
Actions	Description		
	Responsible		
	Schedule		
	Scheduled	Start	End
	Actual	Start	End

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Attachment 4:

<b><u>Risk Analysis AFTER</u></b> <b><u>Response Measures</u></b>	
Probability of occurrence	
Assumptions	
Additional costs for the project	
Impact on Schedule	
Effect on reputation (if applicable)	
Physical Integrity impact	