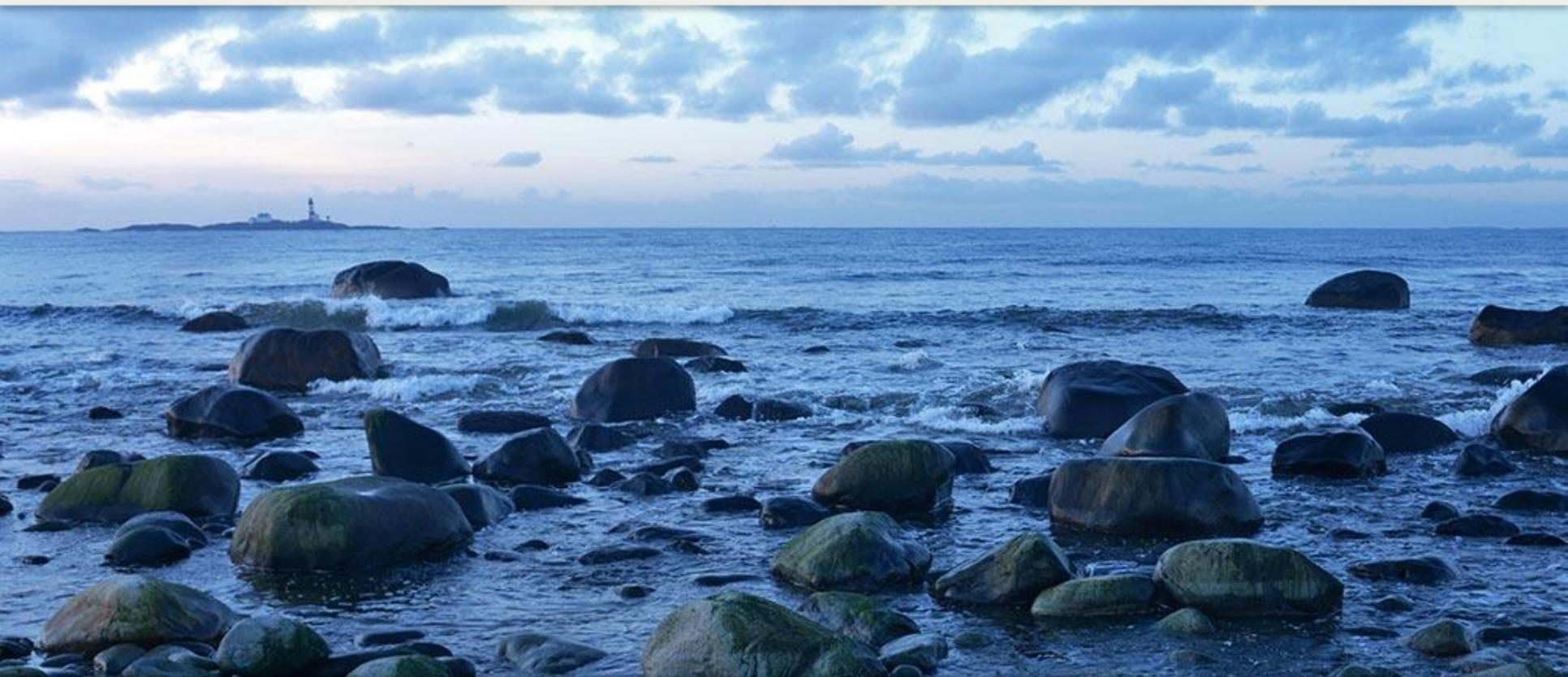


Diskos handbook

Version 1.0

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The Diskos handbook aims to be a
**one-stop-shop for guidance
and relevant information**

Introduction by Diskos management



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Welcome to the Diskos user handbook. This handbook provides you with a brief overview and introduction to Diskos from a user perspective. You will also find links and references for further in-depth information relating to the Diskos operation.

The Diskos National Data Repository has become an essential tool for storing, sharing and online retrieval of these data and today the Diskos group has more than 50 members and over 20 associated members.

NPD has put a lot of effort into the Diskos project as they believe the futures lies in the interpretation of raw data rather than the collection of it. The synergies include less cost relating to upload, storing and download of data, as well as efficient access to public data, seamless distribution of shared data and well-balanced data trades.

Diskos is designed to efficiently manage all the vast quantities of data generated from exploration and production activities and make selected information easily available and accessible. Users will also get data of known quality on agreed data formats.

This handbook is a living document, meaning it will be updated according to the information needs of Diskos users. We hope you will contribute to building our shared knowledge through suggesting topics you would like us to expand upon.

Best regards,
Eric Toogood and Elin Aabø Lorentzen, Diskos Management

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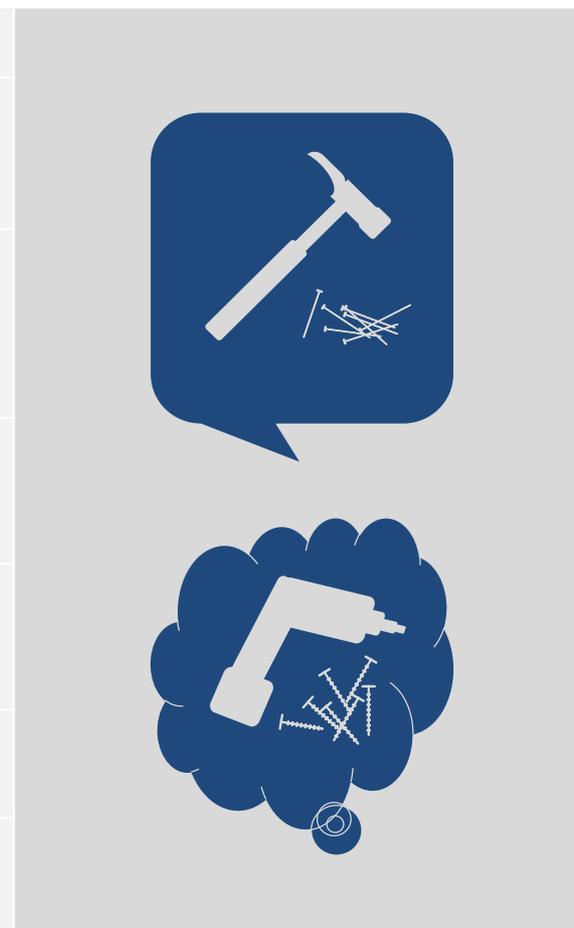
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Section 1: Terminology

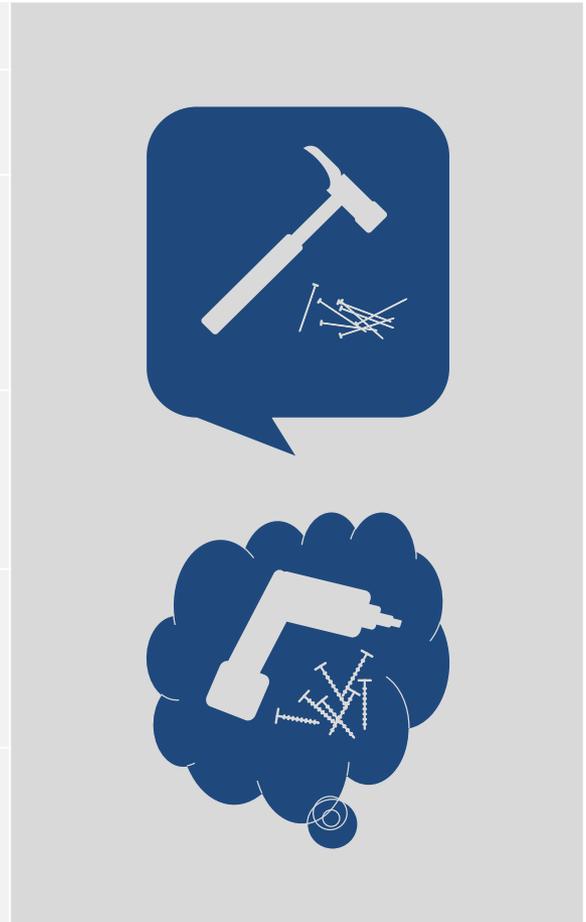
Creating a common language by decoding the terminology

TERM	EXPLAINED
Diskos	A joint venture consisting of the Norwegian Petroleum Directorate (NPD) and oil companies with interests on the Norwegian Continental Shelf (NCS). Scope of operations is described on page 9.
Diskos NDR	Diskos National Data Repository (NDR) are databases used to store geodata from the NCS. The Diskos NDR is subdivided into four modules: Seismic, Well, Production and Trade. Functionality in the software connecting these modules to the end-user are described in section 4.
Diskos Management Committee	The highest authority in Diskos. Mandate and scope of authority is described in section 2. Management Committee member responsibility is described on page 23.
Diskos Steering Group	The second highest authority in Diskos. Mandate and scope of authority is described in section 2.
Diskos Chairman	The NPD is the Chairman of the Diskos Joint Venture.
Diskos Management	Diskos Management administers the joint venture on behalf of the Diskos member companies. Mandate and scope of authority is described in section 2.



Creating a common language by decoding the terminology

TERM	EXPLAINED
Members	The collective term for Original Members and New Members. Members are described in section 2.
Associated Member	Any company defined by the Diskos Management Committee as a non-oil company that offers services and/or products to the market, either to Diskos members or non-members, and has signed the agreement for Associated Membership in Diskos. Associated members are described on page 10.
DBO	The Database Operator (DBO) operates the Diskos NDR (national data repository) through an agreement with the NPD on behalf of Diskos (Joint venture between NPD and licensees on the NCS). The scope and mandate of the DBO is discussed on page 14.
GTO	Geodata Trade Operator (GTO) is responsible for ensuring a best possible flow of data between all companies on the NCS through administration of the data exchange (user entitlement trading) process relating to the Trade module.
Entitlement	Entitlements grant data access and are set at a dataset level. They fall into three groups: Owner entitlements, trade entitlements and user entitlements. Entitlement types and change scenarios are elaborated in section 6.



Section 2: **Scope of Diskos operations**

Diskos enables data storage and transfer at high speeds at low cost to member companies



Diskos background and mandate

Exploration and production generates enormous quantities of data, which has proven to be both costly and complex to handle. Diskos was formed to efficiently handle the data on behalf of the Diskos member companies, as opposed to each company handling their data individually.

Diskos is a collaboration between the Norwegian Petroleum Directorate (NPD) and the oil companies on the Norwegian Continental Shelf. The initiative was launched by NPD, Hydro, Saga and Statoil in 1992. Today, the collaboration includes 50+ oil companies (Members) and 20+ non-oil companies (Associated Members). Members contribute a fixed annual fee to Diskos operations.

All data is stored according to the strictest security regime in the National Data Repository (NDR) and includes both public and private data. Private data can only be accessed by those who are entitled to it. Public data is accessible to all members. Data safety, integrity and accessibility are at the core of the solution.

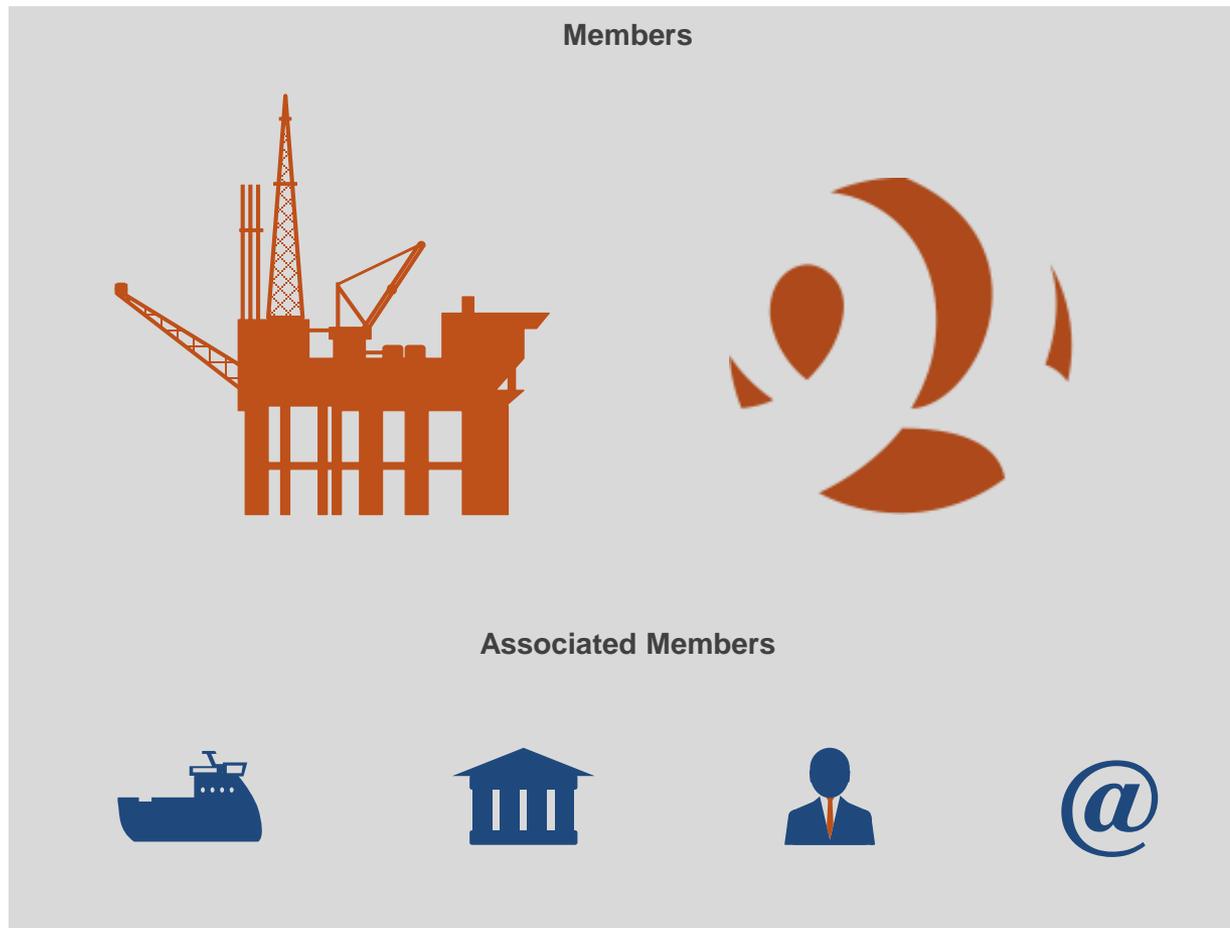
Data types include *Seismic* data, *Well* data and *Production* data. Companies frequently *Trade* entitlements to private data with other companies; part of the Diskos mandate is to ensure an efficient flow of data between companies by managing these entitlements.

Requirements, specifications and standards for the joint venture are set by the Diskos collaboration. This includes all aspects of software and operations, as well as data quality, formats and standards.

Diskos is comprised of joint venture owners (Members) and Associated Members

Members, the main financiers of Diskos, define the scope of Diskos operations. Oil company members have an equal place in the Management Committee. Member contract is elaborated on page 11.

Non-oil companies, i.e. Associated Members, were included to increase the flow of geo data on the NCS and enable the creation/distribution of value added products. Associated Members have fewer rights and obligations. Associated Memberships include, but is not limited to, seismic companies, consulting companies, information distributors (internet portals), Norwegian universities and Geological Survey of Norway.



Diskos' scope is regulated through contracts with members and database operators

Participants agreement*

The different member types are described on the previous page. This section is limited to the “Participants Agreement”.

The agreement between the original Members established a joint venture, which include system development and the operation of a joint information system (database) for petroleum technology data. Additional Members have joined the Joint Venture by signing the Accession Document to the Members Agreement.

The NPD acts as the Joint Venture Chairman through Diskos Management, who execute the day-to-day operation of the joint venture.

All joint costs and incomes are split among members each quarter, according to a formula decided by MC. Allocation of funds are approved by MC through the budget. Diskos Management executes the budget.

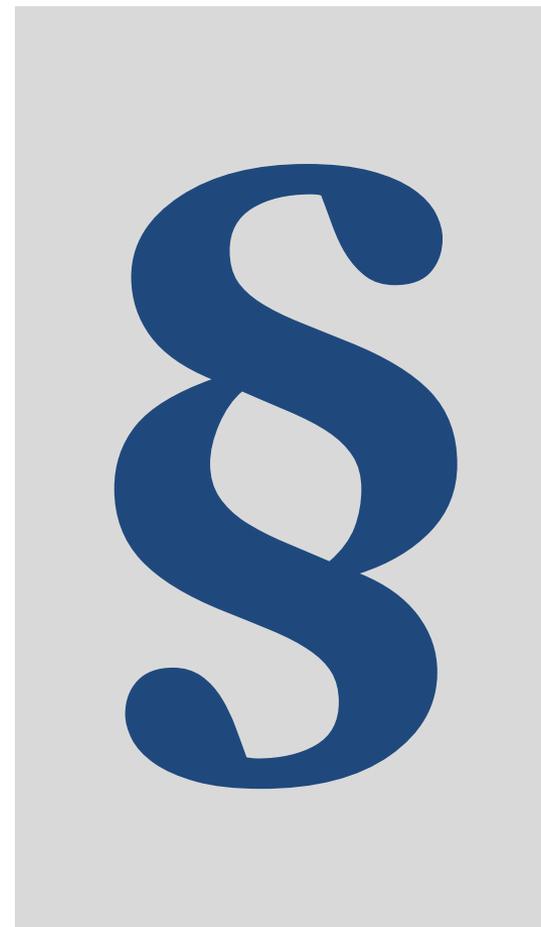
Database operator agreement*

The “Operational Services Agreement”, hereafter referred to as the agreement, governs the provision of services relating to the operation of the IT solutions such as hardware, infrastructure and software.

The deliveries from the database operator shall serve the functions and meet the requirements specified.

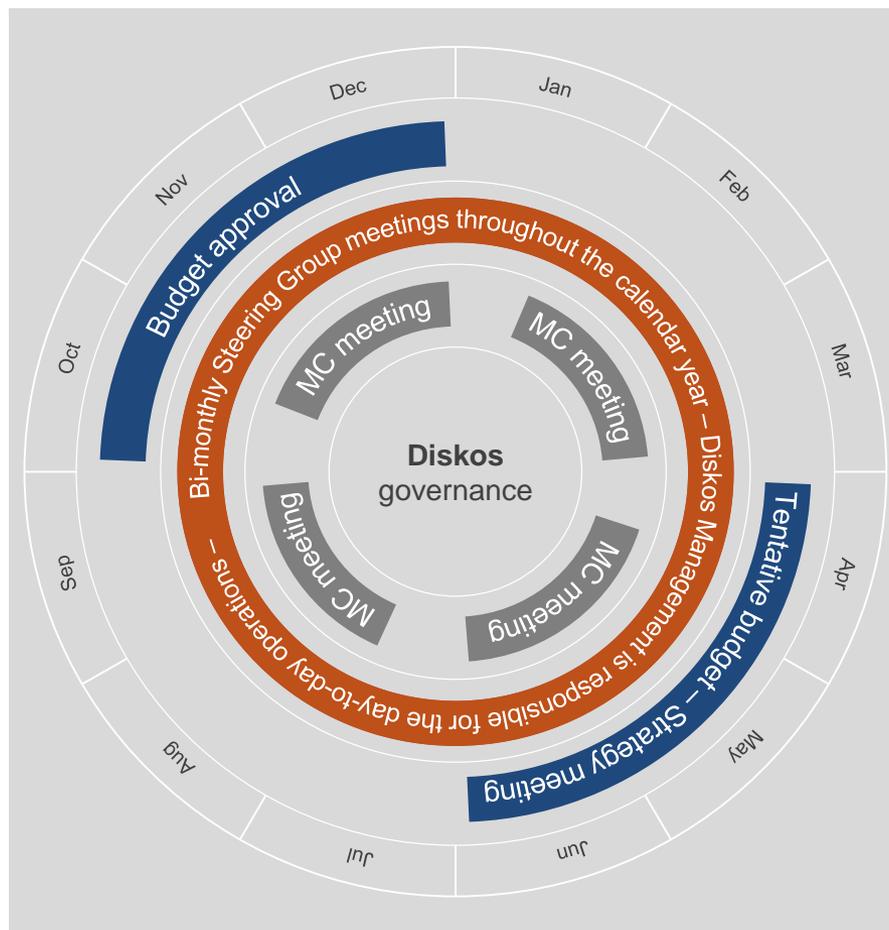
The agreement is for a term of seven years; including one year of transition (development, testing and implementation) and six years of regular operation, commencing January 1st 2015. Diskos can renew the agreement for a period of up to three years.

Upon termination, copyright for software, documentation and other materials are specified in the agreement. Diskos (members) retain copyright to all data handed over to the DBO for processing, including output, and storage.



**Description below may differ from actual contracts. Contracts must be reviewed in order to assess judicial aspects.*

Direction is set by MC, elaborated in a strategy/ budget, and executed by Diskos Management



Management Committee (MC) meetings

Management Committee meetings are held four times a year, once every quarter. DBOs and Diskos Management provides a status update on the operations for each respective quarter. The Management Committee sets direction going forward and votes on important decisions.

Steering Group (SG) meetings

Steering Group meetings are held six times a year, every second month. Diskos Management provides a status update on the operations. The Steering Group ensures that Diskos moves in the direction set by the Management Committee.

Diskos Management

Diskos Management administers the joint venture on behalf of the Diskos member companies, as well as ensuring that MC/SG decisions and priorities are realized.

Budget process

The budget for the upcoming year is tentatively set by MC in Q2 and finally approved by MC in Q4.

Strategy process

Strategy and project priorities for the upcoming year is set by MC in Q2.

Section 3: **Database operator responsibility**

The Database Operators are responsible for connecting the end user to the data

Database Operator (DBO) mandate

Members can interact with the NDR through software developed and operated by Diskos' DBO(s).

DBOs are responsible for all aspects of connecting the data to the end user, including development and maintenance of hardware, infrastructure and software as well as information security.

Diskos members pay a variable cost for data handling. The price is specified for a multitude of services, formats and distribution methods and is subject to annual CPI adjustments.

The current Diskos' DBOs are

- CGG Services (Norway) AS (Seismic, Well, Production)
- Kadme AS (Trade)



DBOs must ensure the confidentiality, integrity and availability of the information

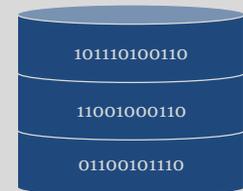
Information security concerns the protection of data and information at an appropriate level and is a shared responsibility.

Confidentiality, integrity and availability must be guaranteed throughout the flow of information. *Confidentiality* ensures that only authorized users have access to information and prevents unauthorized disclosure of information. *Integrity* refers to safeguarding the accuracy and completeness of information and processing methods, as well as preventing deletion and unauthorized tampering with information. *Availability* ensures that authorized users have appropriate access and that information is not withheld.

Users are granted access to the information through standardized procedures and can connect to the information either through SOIL (Secure Oil Information Link), Direct line (Point to Point VPN, IPVPN), or through the internet using VPN (LAN to LAN VPN, IPSEC). The latter should only be used if SOIL or Direct lines are not available/applicable.

Diskos services are delivered according to industry best practice and database operators are obliged to be compliant with the ISO2700x set of standards.

The DBO's are responsible for ensuring compliance with processes, procedures and policies to ensure the systems have an appropriate level of security. If an incident occurs, the DBO's have emergency response procedures in place.



Section 4: **NDR modules' key functionality**

Key functionality in the Production module

Data receipt:

Monthly

Production figures are reported from operators.

Data validation:

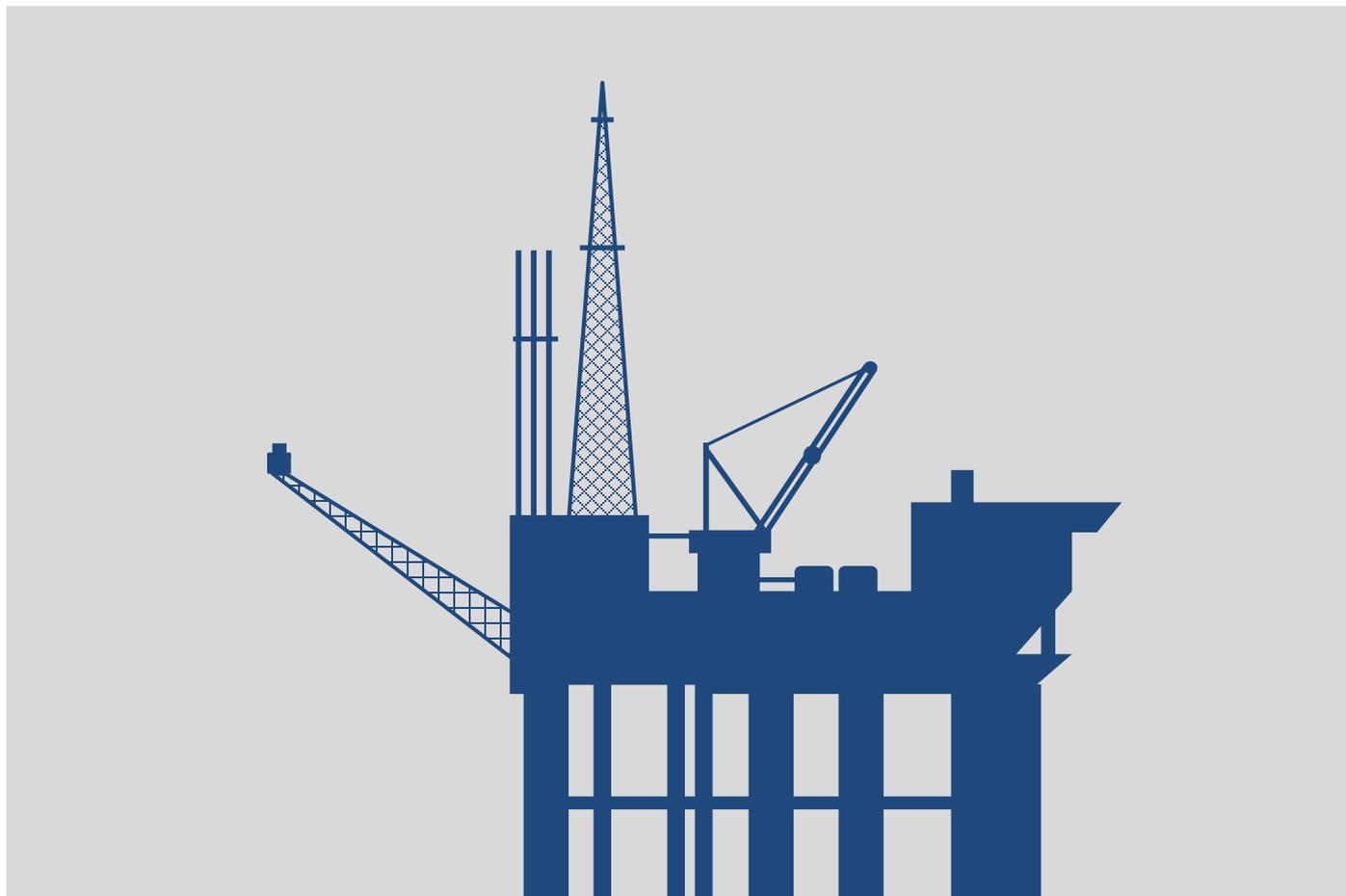
Validation of the production figure reports.

Data view and

export: Public production information is made available through the public production portal.

Data reporting:

Production figures are made available to the NPD and to other authorities as legally required.



Key functionality in the Seismic module



Data submission: Upload selected field data, pre-stack and post-stack data for sharing and long-term storage.

Data format validation: Verification of uploaded data and navigation data

Data quality control: Qualitative and quantitative controls of datasets. Each dataset is marked with a quality indicator (e.g. “acceptable”, “poor”, “unknown”).

Data storage: Seismic data is stored and managed. Companies may choose to store additional datasets not required for authority reporting.

Authority reporting: Seismic data is made available to the NPD and to other authorities as legally required.

Data view, orders and delivery: Search and identify the availability of specified seismic data. The company can request the data to be delivered using various media.

Data entitlement: Manage changes in entitlements to datasets. Entitlement change requests from the Trade module are executed through this functionality.

Key functionality in the Well module

Data submission: Upload of well data and geo-reference related documents for sharing or long-term storage.

Data format validation: Verification of uploaded data.

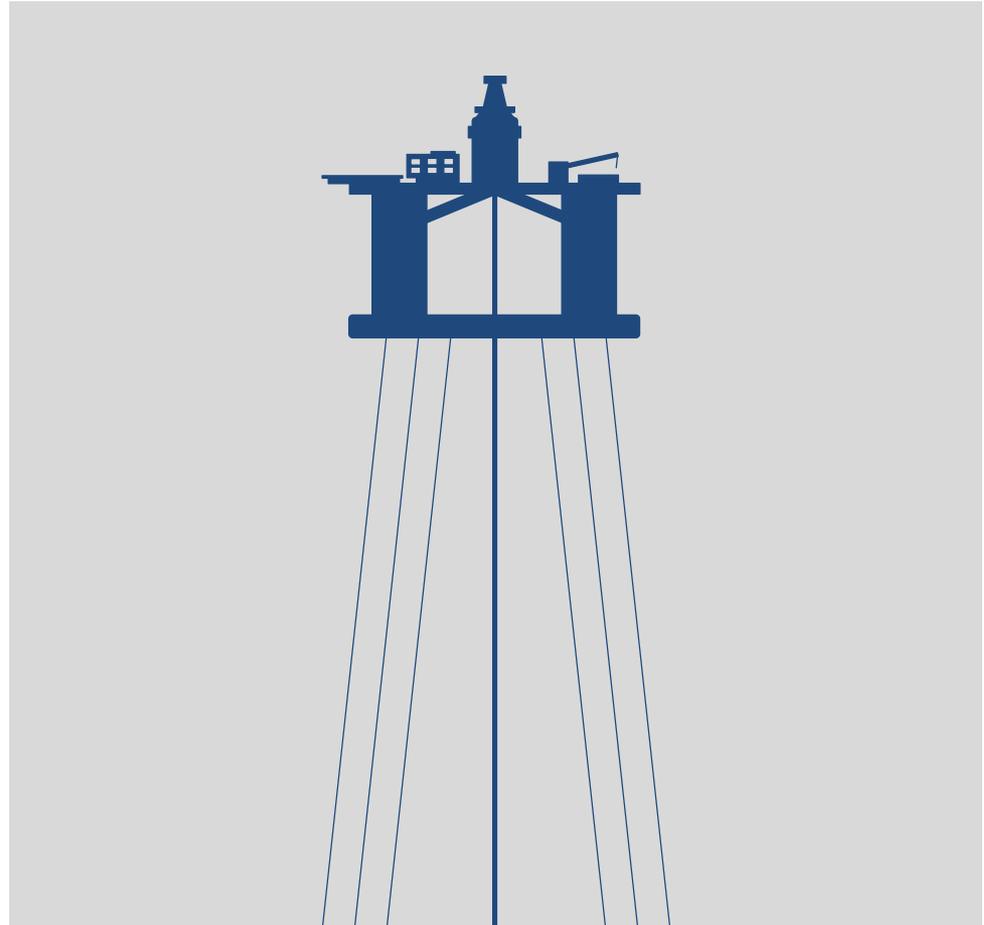
Data quality control: Qualitative and quantitative controls of datasets. Each dataset is marked with a quality indicator (e.g. “acceptable”, “poor”, “unknown”).

Data storage: Well data is stored and managed. Companies may choose to store additional datasets not required for authority reporting.

Authority reporting: Well data is made available to the NPD and authorities as legally required.

Data view, orders and delivery: Search and identify the availability of specified Well data. The company can request the data to be delivered using various media.

Data entitlement: Manage changes in entitlements to datasets. Entitlement change requests from Trade module are executed through this functionality.



Key functionality in the Trade module



Trade registration: Trade proposals are registered in the system.

Trade simulation: Simulation tests the benefit of a potential trade before the trade is executed.

Send for review: Proposed trades are sent for review to all trade object stakeholders (owners).

Contract/Agreements document store: Trade contracts are archived.

Changing entitlements: Entitlement changes are performed by the system.

Tracking for mandatory reporting: Dataset completion within the Seismic and Well module is tracked.

Trade reporting: Customizable and standard trade reports can be created and distributed to the trade operator and the operators.

Section 5: Roles and responsibilities

All changes to Data Manager/Data User status are subject to “Authorized” approval

The designated MC-representative or deputy (oil companies), or the designated Diskos contact person (Associated Members) will be referred to as the “Authorized Approver”.

Only current Member companies, Associated Members or universities that are active members of Diskos are able, (through the authorized approver), to request changes, additions or deletion of users in the Well, Seismic and Production modules. CGG is required to validate the Authorized Approver prior to effecting user change requests.

In the event that the Authorized Approver is not on the approved list, the request will be forwarded to Diskos Management for approval.

For the Trade module, company Scouts have a role equivalent to the “Authorized Approver” in the Well, Seismic and Production modules. Scouts must notify GTO directly to any changes in user privileges.

Data Manager vs. Data User – The primary difference between the Data Manager and the Data User is that the Data Manager is authorized to order and download, whereas the Data User can place items in the cart and transfer the cart to the Data Manager, who would then be able to submit the order.

Access to the Trade module is limited to company Scouts.

Changes, additions or deletions can be requested by completing a form, located on CGG’s FAQ’s: <http://support.diskos.cgg.com/support/solutions>. A completed form must be sent to diskos.support@cgg.com.

The Management Committee member has additional responsibilities, as described on the next page.



The Management Committee representative has a number of key responsibilities



The Management Committee representative is:

- Responsible for Diskos membership and is the main company contact
- Recipient of the invoice for Diskos Annual Fee invoiced by the NPD
- The “Authorized Approver”, as described on the previous page
- Responsible for coordination with the company’s Scout (NOSG) representative and Trade/GTO
- Instruct CGG if «Data sharing» has been agreed to, i.e. granting access to data when formal ownership issues relating to farm-in/farm-outs have not yet been finalized
- Inform Diskos Management of all changes regarding contact information, stand-ins etc.
- Inform Diskos Management and CGG about formal changes in the company name, mergers & acquisitions, take-overs, etc. and other changes to the member company, including which consequences there will be for the «Custodian list» (next page) and associated data access rights.

Section 6: **Entitlements to the geodata**

Users can access data in different ways, depending on their entitlements to the data

Entitlement types explained

- There are three types of entitlements: Owner, trade and user
- Owner entitlements are normally granted to the partners in the license if the license owns the data. Normally user entitlements and trade entitlements follow ownership
- Companies can have user entitlements without having trade entitlements



Entitlement change usually happen as a consequence of the 11 scenarios described below

New/additional data: Entitlements for new/additional data are set when the data is loaded into the NDR.

Company name change: Companies may choose to change their legal name.

Company mergers & acquisition: Companies acquire or merge with other companies, triggering transfer of some or all entitlements.

Unitization: Two or more licenses are merged into one unit and data is shared between the partners; e.g. as a result of development of an oil field spanning cross-licenses.

Farm-in/out: Farm-in/out is a process in which a company enters/leaves the license.

Expiry of license or relinquishment: Partners hold a license for a pre-defined period of time. If the license expires or the period ends for part of the area, then some data is to be made public.

Data trade: Data is traded through the trade module or directly between companies.

Pre-trade: Pre-trades are carried out before the well-/seismic data has been collected, i.e. the traded object does not yet exist.

Data share: Companies are entitled to share data they own as they see fit; e.g. when a M&A or farm-in formal approval takes time and one of the parties request access to data.

Sole risk: License partners agree that only the initiator of a new well assumes all costs, risk and benefits; i.e. sole ownership/user entitlements to the data.

Bottom hole contribution: A company outside the license pays part of the drilling costs to receive some sort of pre-defined benefit, such as user entitlements to data.



Section 7: **Contact information**

Questions and comments must be directed to the appropriate recipient

	RECIPIENT ORGANIZATION	QUESTION	RECIPIENT	E-MAIL	PHONE
 	DISKOS MANAGEMENT	Fixed costs for all modules	Elin Aabø Lorentzen	Elin.Lorentzen@npd.no	+47 97091488
		Invoicing (fixed costs)			
		Basecamp access			
		Coordination of projects			
		Membership questions			
	CGG	User support for Well, Seismic and Production	Diskos Helpdesk	diskos.support@cgg.com	+47 51874255
		Technical issues: Well, Seismic and Production			
		User management: Well, Seismic and Production			
		Risk and disaster: Well, Seismic and Production			
		Variable costs: Well, Seismic and Production			
		Invoicing (variable costs)			
		Entitlements (except for trade and confidentiality)			
		Connectivity			
		Data submission			

Questions and comments must be directed to the appropriate recipient

 	RECIPIENT ORGANIZATION	QUESTION	RECIPIENT	E-MAIL	PHONE
	GTO	Trade requests	Anne-Synnøve Gustavson	angu@norog.no	+47 90770490
	KADME	User support for Trade module	Trade support	tradesupport@kadme.com	+47 51874255
		Technical issues: Trade module			
		User management: Trade module			
Risk and disaster: Trade module					
Coordination of operations and projects	Basecamp – see next page				

The “Basecamp” software enables coordination and collaboration in both operations and projects

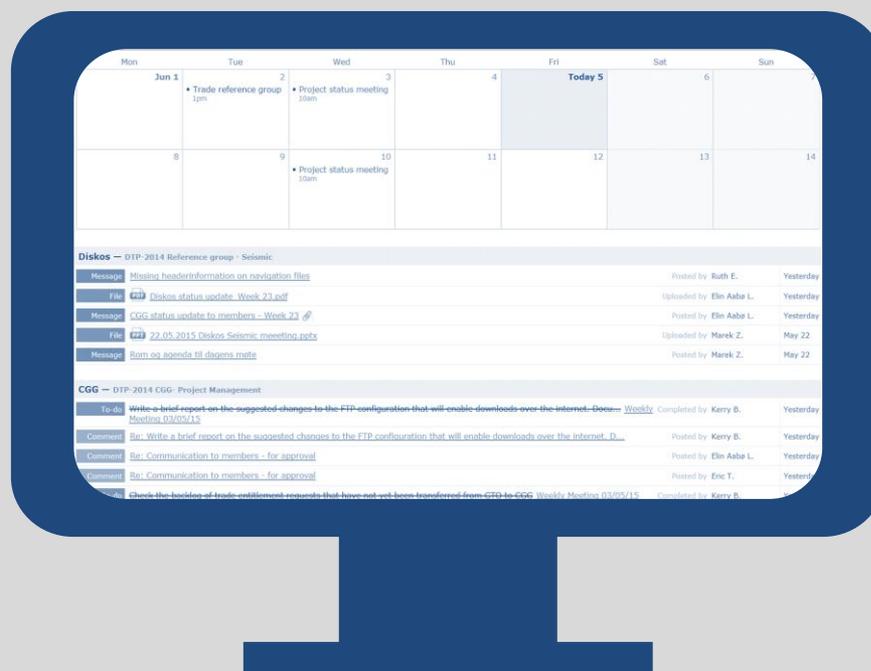
Basecamp is a project management tool used by the Diskos operations.

Primarily, it has been used to communicate with different stakeholder groups, from employees and Management Committee, to project management and database operators.

Users are added to groups according to their information needs. Management Committee members have their own group where they can interact with each other, the Steering Group and Diskos Management etc. A single member can be added to multiple groups.

Basecamp has a forum-like build, where a user can post a thread and other users can reply to that thread. Files can be uploaded to groups and threads.

Other functionality includes a calendar, where group members can be updated on upcoming events and “to do” lists, where group members can plan their upcoming tasks as well as allocating responsibility for their completion.



Section 8: **Further reading**

Further reading for in-depth information relating to the Diskos operation

TITLE	CONTENT	SOURCE
Diskos webpage	Diskos information. Public, Trade, Well, Seismic and Production portal link	www.diskos.no
Basecamp	Forum with relevant discussions. Document library	https://diskos.basecamphq.com/
Diskos strategy	Focus and priorities of the Diskos Joint Venture	https://diskos.basecamphq.com/
Diskos price list	Overview of the variable costs relating to transactions between DBO and Diskos members	https://diskos.basecamphq.com/
Operational Services Agreements	Governs the provision of services relating to the operation of the IT solutions	https://diskos.basecamphq.com/
Original participant agreement	Establishes a joint information system (database) for petroleum technology data.	https://diskos.basecamphq.com/
Entitlement setting processes	Processes and information regarding changes to data entitlements	Contact Diskos Management
Acts, regulation and guidelines (yellow and blue book)	Industry standards and guidelines relating to use, distribution and reporting of geodata	www.npd.no
CGG Diskos	Well, Seismic and Production module login portals, information and FAQs	www.diskos.cgg.com
Kadme	Trade module login portal, information and FAQs	www.kadme.com/solutions/trade/

