OLF Guideline No. 122

RECOMMENDED GUIDELINES FOR THE ASSESSMENT AND DOCUMENTATION OF SERVICE LIFE EXTENSION OF FACILITIES

Including example of a typical Application for Consent

Recommended guidelines for the assessment and documentation of service life extension of facilities
Including example of a typical Application for Consent

General

Introduction

These recommended guidelines outline a proposal for the preparation of the application of renewed consent required prior to use of a facility exceeding the consent period, which may coincide with the initial design life.
In case the further use of existing facilities requires a new PDO or PAD, documentation of the technical and operational integrity on a high level should be included in the plan.

Administrative process

These guidelines have been developed by the Management Systems work group headed by Edvard Brimsø, E.ON Ruhrgas, and with representatives from BP, CoPNo, Esso, Eon Ruhrgas, Amerada Hess, StatoilHydro and Talisman. The work started 11april 2007. Draft editions have been submitted to the reference group consisting of representatives of the authorities, unions and OLF member companies. The Petroleum Safety Authority (PSA) and the Norwegian Petroleum Directorate (NPD) have been consulted in the development of these guidelines.
Approved by: OLF Operations Committee 6 June 2008.

Website:
These guidelines are available at OLF's website: http://www.olf.no/hms/retningslinjer/

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1. Objectives for the Guidelines

The objectives of these guidelines are to:

- Identify how the operators can assess and document safe operation of facilities for an extended period
- Facilitate the preparation the Application for Consent for Life Extension by proposing a consistent framework and a level of detail for the information that is required for the application

The guidelines describe the analyses and evaluations that should be undertaken, how the application process should be organised and how the application document should be compiled. These guidelines must be used together with the applicable regulations and the requirements stated therein.

2. Responsibility

The operator is responsible to prepare and submit an application for consent for an extended lifetime for a facility.

3. Background

Facilities installed on the Norwegian Continental Shelf (NCS) have a lifetime (design life) and a number of assumptions that are the basis for the approval of the Plan for Development and Operation (PDO) for the field they are associated with.
In the event that the facilities are planned to be used beyond the design life and/or the assumptions in the PDO are changed, then the Operator is required to apply for a new consent to use the facilities. This consent will cover use in a new period.
The requirement to apply for consent is contained in the Information Duty Regulations §5 and the Petroleum Activity Regulations §30a. The required content in the consent document is described in the Information Duty Regulations §6. Consent is given by the Petroleum Safety Authority (PSA) and the Norwegian Petroleum Directorate (NPD).

The Information Duty Regulations §6 require that the application is made a year before the lifetime is exceeded. The review and verification of the application document is a demanding process for both the authorities and the operators. PSA and NPD require this time to be able to plan the review and to ensure completion and approval before the installation design life is exceeded. In order to ensure that the application is sent in due time, the operator should start the application process at least two years before the lifetime is exceeded.

Experience from previous application for lifetime extension demonstrates the need to have guidelines on the application process to ensure an effective process. These

guidelines are intended to ensure a sensible, consistent and unambiguous process. The guidelines also ensure the expectations from the authorities are clearly described and explained.

The guidelines are intended to ensure that the information that is sent to the authorities is directly relevant to the use of the facilities beyond the design lifetime.
The Operator is required to have systems in place that ensure the use of the facility is in accordance with the regulations and the Operators own standards. The Operator is also required to have verification systems in place to ensure compliance with the regulations and the standards. These systems are also the basis for the safe and effective use of the facilities. A detailed description of these systems is not required except where there are elements that are directly relevant to the lifetime extension and aging processes. One of the aims of the guidelines is to reduce information contained in the consent to a minimum to ensure an effective review for the Operator and the Authorities.

The guidelines include a description of how the process for the preparation of the consent should be organized and who should be involved. The guidelines contain a recommendation on the analyses and evaluations that should be carried out to fulfil the expectations from the PSA and the NPD. Experience from previous applications emphasizes the importance of a clear and concise plan that includes the time and resources required for the work.

The guidelines contain a number of examples of how situations could be handled in the consent process. The intention of the examples is to illustrate how the Operator can handle similar situations.
NB. The examples shown are not necessarily real cases.

It is recommended that the requirement to prepare and send an application for consent to use a facility beyond the design lifetime is followed up in the Operators management system to ensure the work can be initiated at the appropriate time.

4. Regulatory references and involvement

Consent for beyond the design life is required both from the PSA and the NPD.

- The requirement for the Application for Consent is described in Sections 5 and 6 of the Information Duty Regulations and Section 30a of the Petroleum Activities Regulations.
- The Petroleum Safety Authority (PSA) is the authority for the Information Duty Regulations and for the Health, Safety and Environment (HSE) aspects of the consent.
- The PSA will evaluate the HSE and technical integrity aspects of the application and consider whether the facility will have a satisfactory safety level for the period that has been applied for and that time and aging processes have been adequately assessed. Safety level in this context is related to acceptable HSE and technical integrity standards.
- The Norwegian Petroleum Directorate (NPD) is the authority for the Petroleum Activities Regulations and the Resource Exploitation aspects of the consent.
- The NPD will evaluate the resource exploitation aspects of the application and consider whether the facility is suitable and efficient for the production of the fields it is intended to be used on and that third party potential has been assessed.
- NPD has prepared draft guidance notes for the Resource regulations and these are contained in *Appendix 1*. (NB. This is an unofficial translation).
- The NPD guidance notes focus on the resource exploitation aspects of the facility and the potential for future third party use.
- These OLF guidelines are intended to be compatible with the relevant PSA and NPD guidance notes for their respective regulations.

These evaluations do not relieve the operators of his overall duties for the technical and operational integrity of the facilities at any time.

5. Definitions

Aging Process – a process of degradation related to the progression of time and/or the use of the facility and the systems related to the facility

ALARP – As Low As Reasonable Practicable, a methodology used for qualitative and quantitative assessment of the risk and risk reduction measures and the benefits of implementation of these. ALARP evaluation is only valid if the risk levels identified are lower than the upper acceptance criteria.

Exemption –denotes the authorities' decision to accept a non-conformity relative to regulatory requirements.

Facility – A fixed installation installed on the Norwegian Continental Shelf that is not defined as a mobile installation. Can be a fixed platform, floating platform or pipeline

Non-conformity – an identified difference between the physical condition and/or standard on the facility and the requirements in the applicable regulations

Gap - an identified difference between systems in place and facilities design and a recognized and accepted standard e.g. the standards in and referred to in the Facilities Regulations

Gap Analysis – a systematic evaluation of the systems in place and the facilities design against the requirements in a recognized and accepted standard e.g. the standards in and referred to in the Facilities Regulations

Life extension – the process to extend the lifetime of the facility

6. Involvement of interested parties / Responsibilities

The operator is responsible for the application for consent for extended lifetime. However, this is such an important process for the future use of the facilities and it is important that the operator actively involve a broad spectre of parties:

- The Operator's management
- The safety delegates
- The unions
- The partners
- The technical discipline authorities in the Operator organization
- The key personnel in the offshore and onshore teams

It is recommended that the application for consent process is presented in formal meetings with the relevant parties. Examples of these:

- Technical Committee Meetings in the License
- Working Environment Committees
- Asset Management Committees for the Operator

The final application for consent document should be presented to the Working Environment Committee before sending to PSA and NPD.

NB. It is a requirement that the employee representatives have the opportunity to comment on the application submitted to the PSA and NPD. These comments will be included in the application.

7. Contents of the Consent Application and Description of the Process

A suggested contents list for an application for consent is shown in *Appendix 2*.
A schematic that shows the steps in the application for consent process is contained in *Appendix 3*. A description of the intention of each step is also included.
The intention of the schematic is to help the Operator set up a plan for the application and to identify the resources that will be required. This is to ensure that the required interested parties are involved at the right point in the application process.

8. Use of the facilities

The Operator should have an overview of what the facilities will be used for in the period that is applied for. This should be described in the application.
The Operator should include the situation where the facilities are fully or partially taken out of service.

Changes in the use of the facility will impact the analyses and evaluations that need to be carried out for the consent.

9. Timing for the application

In accordance to the regulatory requirement in the Information Duty Regulations §6, the application for consent for Life Extension of the Facilities shall be submitted one year before the current lifetime expires. The approval process is both time and resource intensive and the Authorities require sufficient time to review and approve the application.

The structures, the topsides of a facility and the associated pipelines will normally be addressed in a common application. The design lifetime of installations and its associated pipelines may be different and in this case the system with the shortest lifetime will determine the timing for submission unless otherwise agreed with the PSA and NPD.

10. Period for application

The period for the application will normally be the period the Operator has planned to use the facilities. All the analyses and evaluations carried out must be based on this period and demonstrate that the following can be achieved:

- compliance with the regulations throughout the period
- acceptable technical integrity throughout the period
- acceptable risk levels throughout the period
- acceptable management of aging processes

It is recognized that some of the assumptions in the assessment of the plans for the facility may change and extend the period of use. The Operator may therefore apply for a period that corresponds to the demonstrable technical lifetime of the facilities. This is particularly relevant where there is a large uncertainty on the assumptions for the lifetime assessment. This needs to be agreed with PSA and NPD at the outset of the process.

11. Analyses and evaluations

The operators' analyses and evaluations shall demonstrate an understanding of how time and aging processes will affect HSE, technical integrity and resource exploitation and identify measures required to mitigate the impact of time and aging processes. The Operator may already have analyses and evaluations that are carried out on a regular basis or have been carried out for a specific purpose. Such analyses and evaluations are part of the verification process that ensures regulatory compliance. These can be included in the application if still relevant. It is important to note that it is not always necessary to carry out new analyses and evaluations if existing ones are still valid.

A typical specific purpose is lifetime extension projects that are started as a result of higher potential in the reservoir and a desire to improve the economics in the mature phase in the field development.

11.1 HSE and Technical Integrity

The analyses and evaluations shall demonstrate a satisfactory standard for HSE and technical integrity with particular focus on the technical condition of the facilities. The following analyses and evaluations should be carried out.

11.1.1 Structural Integrity

The structural integrity analyses required are described in NORSOK standard N-006 and the guidance notes to the Information Duty Regulations §6.

11.1.2 Technical Integrity and Conditions

The systems and conditions that should be evaluated should as a minimum be the systems contained in Appendix 4. Specific guidance on how the technical systems should be assessed is contained in standards developed by OLF. These standards form the basis for the supporting documents required for the application.

11.1.3 Gap analysis against the Facilities Regulations

A risk based gap analysis against the current version of the Facilities Regulations should be done as part of the application process. The intention of this analysis is to compare the facility to the current regulations and standards. Thereafter to identify improvements that will enhance the safety and efficiency of the facilities and reduce the risks levels in accordance with the ALARP principle.

The requirement for this analysis can be discussed with the PSA at the outset of the application process if:

a. The period applied for is short.
b. The facility is relatively simple.
c. The facility is already built in accordance with the Facilities Regulations.
d. The Operator has or intends to have an analysis of the facility against an equivalent system to the Facilities Regulations. This system shall include standards that are equivalent to the standards referenced in the Facilities Regulations. This system can be an internal company system.

The basis of the technical integrity of the facilities is the design of these facilities. The design is required to comply with the technical regulations and standards at the time the facility was designed and built. These regulations and standards will

have changed since the original design in line with the general principle of continuous improvement.

It is recommended that the gaps identified are assessed for criticality in order to ensure the right priority is given to the implementation measures. The criticality assessment should be used actively in the decision making processes for work on the facility.

The gap analysis methodology is described in Appendix 5.

All gaps shall be evaluated and the ALARP principle applied in the evaluation. The gaps can be closed through technical, organizational or administrative changes or a combination of these. The evaluation of the gap may also indicate that it may not be worthwhile making any changes due to the risk and/or cost of implementation.

The following basis can be used to close the gaps identified.

a. Measures have been implemented that ensures the condition meets the facilities regulation hence eliminates the gap
b. Technical, operational and/or administration measures have been implemented that reduce the risk to an acceptable level and meet the principles of an ALARP evaluation
c. The risk is considered to be low or negligible and no further action is required based on an ALARP evaluation

An evaluation of the gaps collectively shall be carried out to ensure the combined effect of the gaps is within the risk acceptance criteria. This evaluation shall be done when the remedial measures required to close the gaps have been identified.

11.1.4 Changes to Operational Conditions

In the future period for use of the facilities there can be changes to the operations conditions that can have a significant impact on the technical integrity of the facilities. These can be changes in operating conditions in particular increases in temperature and pressure. These can also be changes to the composition of the produced fluids for example hydrogen sulphide production from the reservoir.

The Operator should include an evaluation of the likely changes to operational conditions and the measures required to reduce impact and maintain technical integrity.

11.1.5 Maintenance and Inspection

A review of the maintenance and inspection systems should be carried out to demonstrate how lifetime and aging processes are considered in the maintenance and inspection programs.

Maintenance and inspection systems are often risk based systems, e.g. RCM, RBI and account for expected lifetime in the evaluation of the systems and components. Experience on failures should also be built into this evaluation.

The function of the maintenance and inspection systems should at least cover the functionality, reliability and vulnerability of the systems and components that are important for safety and uptime for the facilities. Typical aging processes that need to be covered are physical processes e.g. wear and tear, erosion, corrosion etc. and administration processes e.g. access to spare parts, competence and knowledge of the systems and components etc.

11.1.6 Barriers

Continual analysis of the barriers in place for the facilities is a requirement in the Management Regulations. The application for consent shall contain a verification that the systems in place for barriers and barrier evaluation are suitable for the new period being applied for.

A review of the organizational barriers should be carried out to demonstrate any impact from time and aging processes.

11.1.7 Wells

A review of the technical integrity systems for the wells should be carried out to verify that the system is satisfactory and accounts for the period that has been applied for and aging processes. The review should include a reference to the standards used for well integrity.

A review should be carried out to show how the wells will be used in the future and the requirement for intervention and maintenance. This analysis will form the basis of the future requirements for the drilling facilities.
The review should be done on both platform and sub-sea wells.

11.1.8 Drilling systems

The future requirements for the drilling systems should be reviewed.
These requirements may not be continual drilling and in this case the Operator should include a plan showing when the drilling systems will be in operation and a philosophy for stop and start of drilling.

The maintenance and inspection systems for the drilling systems should be covered by the evaluation described in section 11.1.5.

11.1.9 Pipelines

The application for consent will normally include export/loading pipelines and inter-platform flow-lines/pipelines.

For major pipeline systems a separate application for consent will be required.

An analysis should be carried out to demonstrate the remaining lifetime for the pipeline and its potential for use beyond the original design life. This analysis should include any major changes in operating conditions that may affect the integrity of the pipeline.

11.1.10 Verification of 'as built' documentation

The Operator should provide a verification of the physical match between the facilities and 'as built' documentation. Particular focus shall be given to critical documentation important for the safe operation of the facilities.

The Operator should describe the process for how documentation is updated in connection with technical and organizational changes to the facilities.

Updating of documentation is a challenge for most of the older installations and 100% updating of documentation is not so likely.
The Operator should therefore carry out an assessment of any increased risk due to documentation that could be incorrect. Personnel involved in the daily operations should be involved in this assessment.

The Operator should review documentation for any major damage or defect that may impact the facility in the applied for period. Typically this applies to damage or defects that have been accepted due to a limited period of use or operation and this period has since been changed as a result of lifetime extension. The Operator is then required to reassess the basis for acceptance and verify that this is still valid for the new period.

11.1.11 Risk Assessment

The application for consent shall include the analyses and evaluations that have been done to verify that the risk levels for the facilities are within acceptable limits in the period that has been applied for, e.g. QRA (quantitative risk analysis), and system for updating the analysis is in place.
A description of the risk assessments carried out and the requirements for updating these risk assessments should be included.

11.1.12 Emergency Preparedness and Response

The application for consent should include a verification that the emergency response systems in place are satisfactory and are likely to be satisfactory for the period applied for. The Operator should evaluate any likely changes to the facilities that will affect the emergency preparedness and response systems.

11.1.13 Environment

The Operator should provide the analyses and evaluations that show how the facilities impact on the environment can be improved in the period applied for.

11.1.14 Working Environment

The Operator should provide the analysis and evaluations that show how the working environment for personnel can be improved in the period applied for.

11.1.15 Compliance with the Regulations

The Operator should have a management system that is set up to ensure compliance with the applicable regulations. This management system should include an overview of the controlling documents for the use and operation of the installation.
The Operator should describe the audit and verification process in place that ensures that this is the case and describe how any changes to the regulations are handled.

11.1.16 Technology

The Operator should provide any evaluations of the application of new (to the facilities) technology and techniques that can be used to improve the HSE standards of the facilities.

11.1.17 Organisation

The Operator should provide an analysis of how experience, competence and knowledge of the facilities can be retained at a satisfactory level in the period that applied for.

11.1.18 Management of Change

The Operator should describe the processes in place for Management of Change (MoC). This should describe both technical and organizational change.

11.1.19 Exemptions

All exemptions from the regulations that have been identified by the Operator and granted by the authorities must be included in the application for consent.

The Operator should carry out a review of these exemptions and assess whether it is acceptable with the exemption in the new period applied for. This assessment should be on both an individual and a collective basis.

Any new exemptions identified through the analyses and evaluations carried out in the application process should be applied for with the application for consent.

11.2 Resource Exploitation

The Operator should demonstrate how the facilities can be used for optimal production of the reserves from the fields that use the facilities. This should include how the facilities can be used for third party production.

The Operator should carry out a review of all the well slots to show how these can be used for efficient production and optimal recovery in the period applied for. This should include potential use e.g. artificial lift, water injection, gas injection, dual completions, etc.

The Operator should provide a cost benefit analysis of the alternatives that have identified for the future use of the facilities. The cost benefit analysis should justify the future use described in the application.

The Operator should provide an assessment of the application of new (to the facilities) technology and techniques for increase in production and reserve recovery.

12. Conditions for Consent

The Operator should clearly describe an overview of the work that will done on the application process after the submission. This should include the plans for implementation of technical and organizational improvements identified in the application process.
These plans may be considered conditions for the consent by the PSA and NPD.

13. Decision Process

The Operator should summarize the alternatives that have identified for the future use of the facilities and the justification for the future use of the facilities in the application.

The Operator should provide an overview of the major decisions that have been taken with regard to the lifetime extension.
The intention of this is to give PSA and NPD an overview of the options the Operator has considered, the assumptions made and the basis for the decisions.

14. Verification and Approval

The Operator should ensure that the analyses and evaluation work has been carried out in accordance with the regulations, the relevant company standards and has been verified by the appropriate technical discipline authority.

The Operator should ensure that the decision have been approved by the relevant parties in the operator company and the partners.

The Operator should ensure that the application for consent is verified and approved by the appropriate persons.

15. Experience Transfer

The Operator should ensure that experience on lifetime extension from other installations and operating areas is applied to the analyses and evaluations carried out for the application. Any specific relevant information and reference should be included in the application document. The Operator should seek for best practice on lifetime extension both internally and externally.

16. Implementation

Following the analysis and evaluations carried out by the operator in connection with the application for consent, the operator must prepare a plan to put into effect the conclusions of the analysis and evaluation in order to maintain the integrity of the installation for another consent period. This plan must include an inspection and maintenance programme that takes into account the aging of the facilities. The application should also include any operational activities that limit the use of facilities and equipment.

Appendix 1 - NPD Guidance Notes on Lifetime Extension

Note: Unofficial Translation

Facilities can be used for a longer period and/or in alternative ways than planned in the original PDO. Normally major changes to the use of the facilities will be subject to a revised PDO.

In the event that a facility will be used beyond the original design life and/or the assumptions in the PDO are changed then the License Holders require consent from the NPD. This consent will normally be applied for by the Operator.

The basis for the NPD review is whether the facility is suitable for the use it is intended. The NPD will not review the HSE aspects of the facility.

The Operator should document the need for and opportunities for resource exploitation including the potential for third party use of the facilities. The NPD will require an overview of the facility's suitability and efficiency for the purpose it is used and an overview of the cost of this use. This overview should include an assessment of the potential for third party use and the suitability and efficiency for this use.

The Operator should demonstrate the alternatives to the planned use that have been evaluated and the basis for the decision on the planned use. Alternatives that should be evaluated are use of other facilities and the construction of new facilities.

Appendix 2 - Suggested contents list for an application for consent

Note that the application for consent can be sent in either Norwegian or English

Basis for the application
In section 1.1 the Operator should provide a basis for the application. This is a high level overview of the application, the most important assumptions in the application and a summary of the conclusions from the analyses and evaluations carried out.
The basis is effectively an executive summary of the application and should assist the PSA and NPD personnel involved in the consent process.

0. DISTRIBUTION LIST

1. INTRODUCTION

1.1 Basis for the application
1.2 Period applied for
1.3 Applicable Regulations for consent
1.4 Overview of the facilities and the field(s)
1.5 Approved plan for the future use of the facilities
1.6 Overview of work on the exploitation strategy
1.7 Overview of the Principle Enterprise

2. ACTIVITIES COVERED BY THE APPLICATION

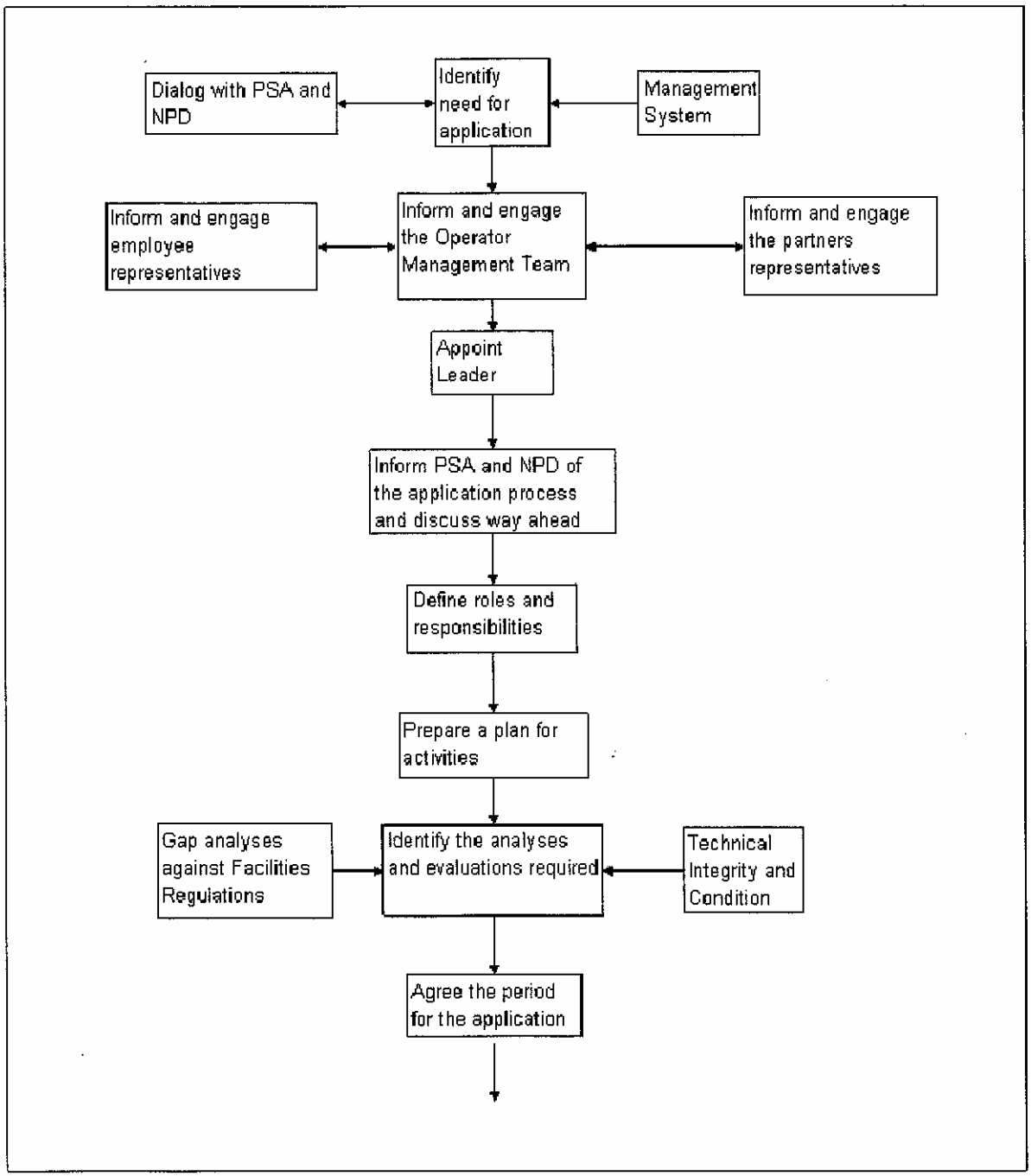
2.1 Operations
2.2 Maintenance
2.3 Modifications
2.4 Drilling
2.5 Well Operations
2.6 Decommissioning
2.7 Pipelines

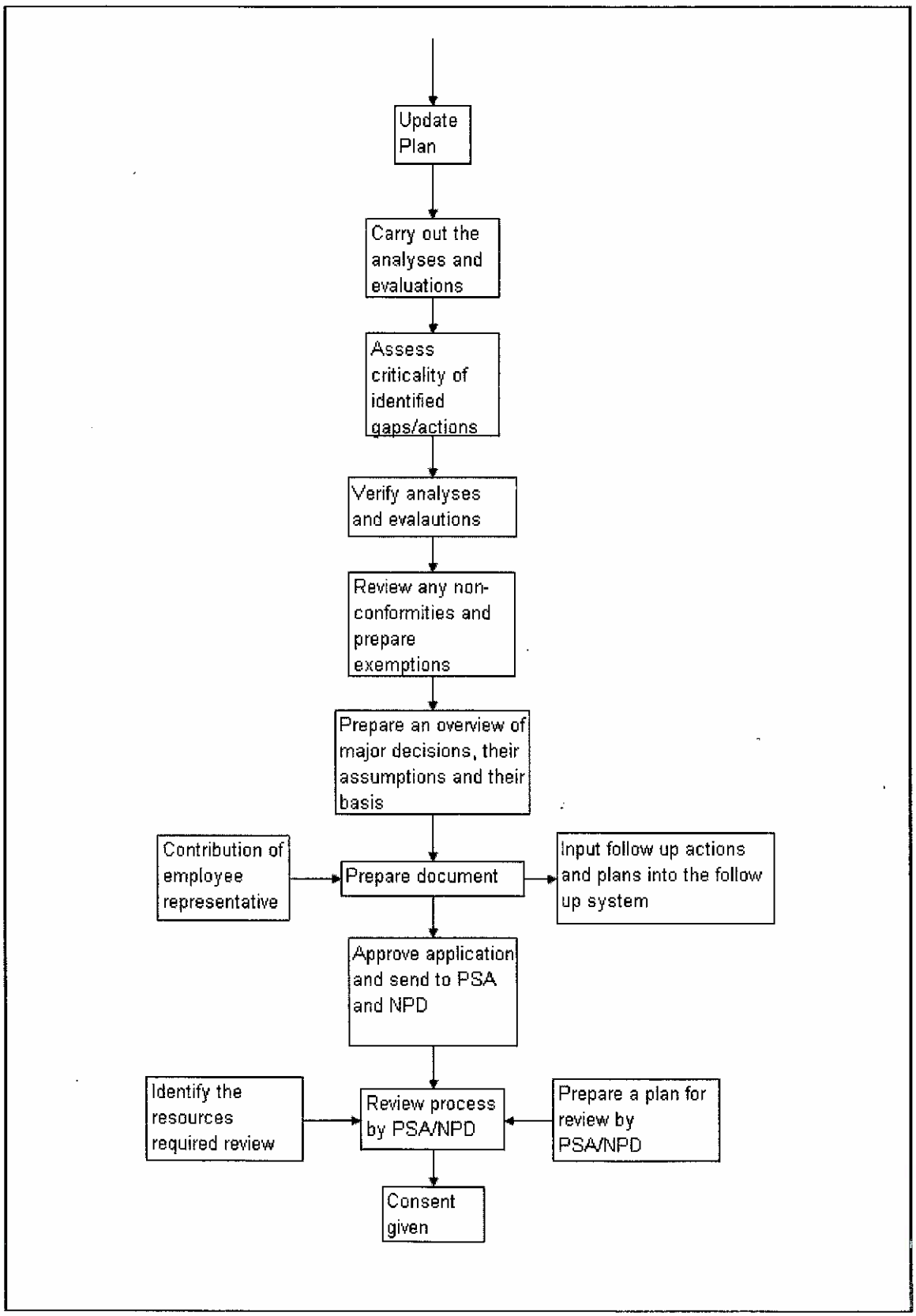
3. MANAGEMENT SYSTEMS

3.1 HSE
3.2 Emergency Response
3.3 Technical Integrity
3.4 Project Management
3.5 Organization and Competence
3.6 Audits and Verification

4. EXEMPTIONS FROM THE HSE AND RESOURCE REGULATIONS

Appendix 3 – Schematic of the application process




Update Plan
Carry out the analyses and evaluations
Assess criticality of identified gaps/actions
Verify analyses and evalautions
Review any non-conformities and prepare exemptions
Prepare an overview of major decisions, their assumptions and their basis
Contribution of employee representative
Prepare document
Input follow up actions and plans into the follow up system
Approve application and send to PSA and NPD
Identify the resources required review
Review process by PSA/NPD
Prepare a plan for review by PSA/NPD
Consent given

Explanation of the steps:

a. Identify need for application

The requirement to apply for consent should be evaluated from the original lifetime and in the event of any major changes to the assumptions in the PDO for the field.

The original lifetime is included in the PDO for the field and is relatively clear.
The extent of the changes to the PDO assumptions that require an application needs to be discussed with the PSA and NPD.
Note: In this case the requirement for a new PDO has to be discussed with the Ministry of Petroleum and Energy

It is recommended that the requirement to apply for consent for lifetime extension is put into the Operators system for follow up. E.g. Synergi, Traction, SAP etc.
The timing for starting the process should be at least two years before the lifetime is exceeded.

In the event of any major plans to change the use of the facilities, e.g late life projects, the issue of lifetime extension should be considered irrespective of when the lifetime is exceeded. It is sensible to use the resources available for the lifetime project to work on an application for lifetime extension.

When the basis for the application is in place then the Operator can start the process.

b. Inform and Engage the Operator Management Team

The process to prepare an application for lifetime extension is time and resource consuming. The Operator management responsible for the facilities needs to take ownership of the process from the outset. Resources need to be made available and the activities need to be included in the company plans. Funds need to be allocated in the budget process.

The partners in the facility need to be engaged in the process at the outset.

The employee representatives have a major role in the application process and need to be involved at the outset. The employee representatives are also expected to provide comments to the process and their involvement in the application document.
It is advisable that an employee representative is appointed to follow up the process form start to finish.

c. Appoint Project Leader

A project leader should be appointed to coordinate the application process and to plan the analyses and evaluations required. The project leader will need both internal and external resources for the work and requires therefore a clear authority and budget.
The project leader will need to work with the following parties:

- discipline engineers and in particular technical authorities
- employee representative organizations
- partners

d. Inform PSA and NPD

The Operator should inform PSA and NPD of the start of the application process and arrange a meeting to discuss the following:

- the basis for the application
- the period for the application
- the facilities to be covered by the application

It is important that the Operator, PSA and NPD establish a good dialog at the start of the process. It is advisable that the operator request a meeting with PSA in order to agree on PSA's further involvement in the process.

e. Prepare a plan for the activities

A plan for the activities should be prepared showing who is responsible, milestones and deadlines, important connections and dependencies and planned meeting.

An estimate for the cost of the application process should be included in the license budget process.

f. Define roles and responsibilities

The roles and responsibilities for the participants in the process should be defined at the outset. This includes personnel within the Operator's organization and contractors required to carry out work.

g. Identify the required analyses and evaluations

The required analyses and evaluations are determined by reference to the regulations, Operator's own assessment and experience gained from previous applications. These guidelines should also be used to assess the required analyses and evaluations.

h. Agree the period for the application

The Operator should decide the period to be applied for and inform PSA and NPD.

The period can either be related to the planned period for the facilities (safety, commercial evaluation) or be based on the demonstrable technical lifetime (technical condition).

The analyses and evaluations carried out must demonstrate that the facility can be used in the period applied for.

The Operator can use the facilities beyond the new period applied for by submitting a new application one year before this period expires.

i. Update the plan

An update of the plan should be done at this stage since all the assumptions for the application process should be in place. Any impact on the activities to be carried out and the time and resources required should be assessed at this stage.

j. Carry out the analyses and evaluations

Carry out the analyses and evaluations and ensure results and conclusions are available within the deadline required for the application.

k. Assess the criticality of gaps/actions

Gaps, actions and remedial measures that are identified in the analyses and evaluations should be assessed for criticality in order to influence the prioritization of these in the planning processes.
The main factor for the criticality should be the risk associated with the gap/action and it is expected that the gap/action with the highest risk has the highest priority.

l. Verify analyses and evaluations

All the analyses and evaluations carried out by internal personnel and external companies must be verified by the Operators own personnel. It is up to the Operator to ensure the appropriate person has the necessary competence and authority for the verification.
The Operator should prepare a plan for verification at the outset of the application process.

m. Review any non-conformities and prepare exemptions

Any exemptions that have been given by the authorities for the facilities should be referenced in the application.
An evaluation should be made as to whether it is acceptable to continue with the exemptions through the period applied for. This evaluation should be on both an individual and collective basis.

In the event that non-conformity from the applicable regulations is noted in the application process then the non-conformity should be handled in accordance with the Operators management system. An application for exemption should be sent to the PSA or NPD as part of the application for lifetime extension.
The exemption details should be included as an Appendix to the application.

n. Prepare overview of major decisions

The Operator should prepare an overview of the major decisions that can affect the future for the facilities and can influence the review of the application.
The basis for the decisions should also be referenced.
It is advisable that this is discussed with PSA and NPD through the application process.

o. Prepare document

A typical contents list for an application for lifetime extension is included in Appendix 2 of these guidelines.

p. Contribution of the employee representatives

The employee representatives must be involved in the application process and have the opportunity to comment on the application and the application process.
The comments should be included in a separate section in the consent document.

q. Approve application for consent document and send to PSA and NPD

The application for consent must be approved by the Operator's management before it is sent to PSA and NPD.
The Operator's management must confirm any commitment included in the application and verify the assumptions that form the basis for the application.

r. Review process

The review of the application can be a significant effort and must be planned properly. It is important that sufficient resources are available from PSA and NPD to review the application and the relevant documentation. It is advisable for the operator to prepare a plan for the review process as soon as the application has been received by PSA and NPD. The Operator must make personnel available to assist in the review process and to have dialog on the main issues with the PSA and NPD. The employee representative organizations must also ensure personnel are available for the review process.

s. Consent given

The overall objective is to have the application for consent approved by PSA and NPD before the lifetime is exceeded.

Appendix 4 - System and conditions that should be evaluated

Specific guidance on how the technical systems should be assessed is contained in standards developed by OLF.

1. Integrity Management Systems
2. Load Bearing Structure
3. Transport Systems (Pipelines, Risers)
4. Drilling And Well Systems
5. Process Systems / Top Side
6. Sub Sea Systems
7. Technical Safety Systems (TST) – se details below
8. HSE (Health, Safety & Working Environment) – se details below

7. Technical safety systems (TST), could include
    - Emergency Shut down Systems – ESD
    - Evacuation
    - Fire & gas detection - FGD
    - Public Address systems – PAS

8. HSE (Health, safety & working environment) could include
    - Accommodation
    - Walkways, stairs
    - Chemicals handling
    - Illumination
    - MTO
    - Noise and vibration

Appendix 5 - Experience Transfer

The purpose of this appendix is to describe examples of issues that are relevant to lifetime extension in order to give guidance on how to approach the requirements for analyses and evaluation.
Note: not all examples are related to real cases

Emergency Preparedness

Platform A is subject to subsidence of the seabed due to reservoir compaction.
The subsidence will result in the platform being defined as unmanned in extreme weather and therefore as 'low consequence' for structural analyses. The background for the definition and the procedures for demobilization were described in the application for consent document.

Platform B had an emergency plan that was dependant on cooperation with other platforms in the area. One of the other platforms was taken out of service and a review of the emergency plans was made to ensure the performance standards could be achieved with the platform out of service.

Physical changes to the facilities

Platform C was planned to be modified in connection with the late-life phase.
The modifications were carried out in accordance with the facilities regulations. A gap analysis against the facilities regulations was carried out for the rest of the platform in order to determine how the interfaces between old and new should be handled.
This analysis was used as the basis for the application for lifetime extension at a later date.

Platform D consists of a number of platforms connected by bridges. The accommodation platform at the far end of the complex is planned to be taken out of service and another platform will become the 'far end' platform. This platform should then meet the requirements for escape and evacuation and the NORSOK requirements for evacuation systems. An analysis was carried out to demonstrate acceptable risk levels and acceptable frequency of loss of main safety function. The conclusions from the analysis were included in the application for lifetime extension.

Platform E was planned modified to be able to produce more gas from the field. The modifications were considered a change in the assumptions in the original PDO and an application was required. The modification would allow the platform to produce for a period longer than the original design of the facilities. At that time there was still 7 years left of the original design life.
An application was prepared that covered the period up to the facilities were planned to be taken out of service. An additional application one year before the original design life was exceeded was therefore not required.

Limited lifetime

Platform F is an unmanned platform and was planned to be used for a period of 3 years beyond the original design lifetime. The Operator considered that a gap analysis against the facilities regulations was not justified. This was discussed and agreed with the PSA.

Changes to operating conditions

Platform G carried out a modification to the process facilities to be able to inject gas into the reservoir for increased recovery. In some wells gas was anticipated to break through into the production wells resulting in a closed in wellhead pressure higher than design for the flow-lines. Modifications to the overpressure protection system were identified as part of the application process.

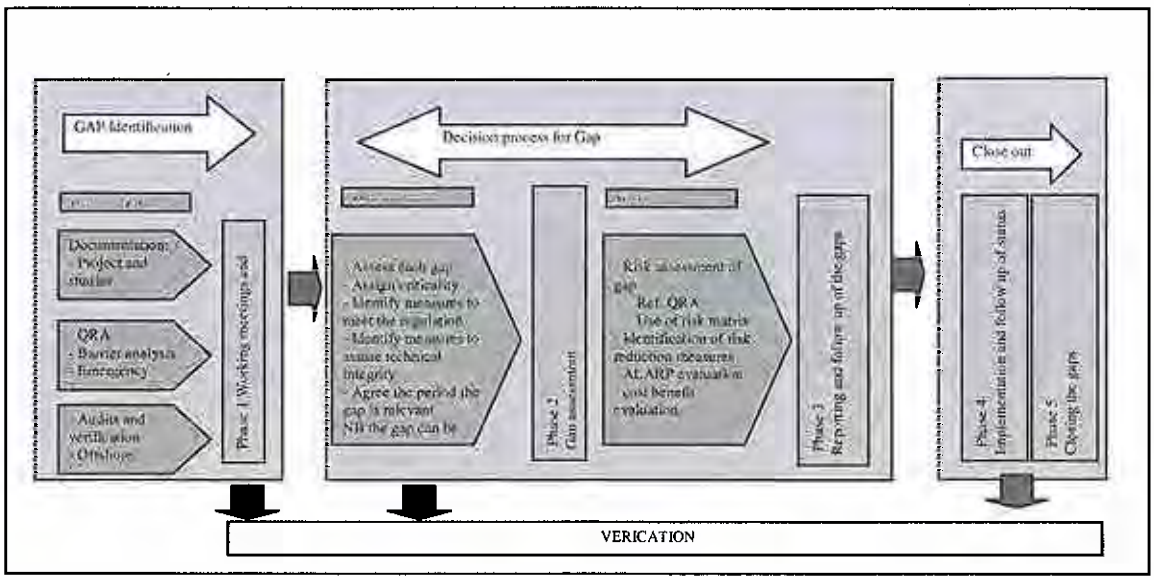
Potential non-conformities and requirement for additional exemptions

Platform H carried out an assessment of the working environment conditions on the platform and concluded that the requirements for arrangement to work and ergonomics in one of the areas could not be met. The intentions in the Activities regulations were not achieved. Remedial measures were put in place and non-conformity handled through the Operators management system. An exemption was included in the application for consent document.

Experience Transfer and Best Practice

The Operator of platform I carried out an extensive lifetime evaluation of platforms in the UK sector due to an assessment of extended lifetime for oil price increase. Experience transfer from this assessment was used to establish a best practice for various studies including development of maintenance strategies.

Appendix 6 – Gap analysis against the facilities regulations



Appendix 7 – Overview of Information Duty Requirements

The intention of this Appendix is to give an overview of how the specific requirements in the Information Duty Regulations are met through following these guidelines.

Reference §6 regulations

Paragraph	Section in OLF Guidelines	Comments
a) information on which activities are intended to be carried out	Sections 7 and 11.1.4 Appendix 2	The application should contain any changes and potential changes to activities
b) a description of the activities comprised by the application, and the progress plan for these activities	Section 7 and 11.1.4 Appendix 2	The application does not require a detailed plan of all the activities
c) a programme for the first well if the application comprises drilling and well activities in respect of one or more wells, cf. also Section 7 on drilling and well activities	Not relevant to this application	
d) an overview of steering documents in respect of the activities comprised by the application,	Section 11.1.15	The application should only include the reference to the systems in place and not a detailed description of these systems.
e) a description of the management systems for the activities comprised by the application, cf. also the Management Regulations Section 3 on management of health, environment and safety,	Section 11.1.18 Appendix 2	The application should only include the reference to the systems in place and not a detailed description of these systems.
f) an overview of exemptions granted according to the health, environment and safety legislation,	Section 11.1.19 Appendix 2	The evaluation of continuing with the exemptions must be done and included in the

		application
g) information stating whether agreements have been concluded with contractors, and if so who is to be regarded as the principal enterprise in connection with such agreements, cf. also the Framework Regulations Section 44 on several employers at the same workplace, principal enterprise,	Section 2 Appendix 2	The application requires a statement on who is regarded as the principal enterprise.
i) a summary of the results from the environmentally oriented risk and emergency preparedness analyses, together with a description of how the planned emergency preparedness against acute pollution has been provided for, cf. the Management Regulations Section 16 on environmentally oriented risk and emergency preparedness analyses, and the Activities Regulations Section 64 on establishing emergency preparedness,	Section 11.1.11 Section 11.1.12 Section 11.1.13	The application should include the reference to the systems in place and not a detailed description of these systems. Any major changes anticipated due to aging or time should be noted and assessed
j) a description of the results of the internal and external follow-up, cf. the Management Regulations Section 21 on follow-up and the Framework Regulations Section 15 on verifications, and a description of the planned follow-up of the activities comprised by the application,	Section 11.1.15 Appendix 2	The application should only include the reference to the systems in place and not a detailed description of these systems.
k) general drawings of the facility,	Not required for this application	
l) a statement about the application from the elected representatives of the employees, cf. also the Framework Regulations Section 6 on arrangements for employee contribution.	Section 6 Appendix 3	
m) an Acknowledgement of Compliance, where applicable.	Not relevant for this application	

Reference §6 guidelines

Paragraph	Section in OLF guidelines	Comments
a) Fatigue life calculated according to current rules and regulations and corrected for changes in assumed weights and weight distribution caused by modifications or changes in assumed usage, such as use of derrick, ballasting and loading and unloading operations.	Section 11.1.1	The requirements are adequately described in the Information Duty Regulations and do not need further detail.
b) Redundancy in the event of substantial damage to hull or brace followed by water filling, substantial internal damage to hull or main deck, or damage to the anchoring system or the positioning system: - check for overload in connection with environmental loads with return period of one year. For semi submersible facilities, shell elements shall be used in the modelling of the structural elements in the connection between braces and columns, - fatigue life.	Section 11.1.1	The requirements are adequately described in the Information Duty Regulations and do not need further detail.
c) Verification of physical match between the facility and as-built documentation so that - later modifications or changed usage are taken into account in analyses and calculations, - local weld-ons or scallops do not change the integrity, - local modifications do not change the watertight and weatherproof integrity.	Section 11.1.10	This section was originally intended for documentation related to structures and load bearing systems. This has been extended to a more general review of documentation for the facility
d) Operator's additional considerations and requirements with respect to inspection and maintenance as a result of extended life for marine systems such as	Section 11.1.5	

- watertight and weatherproof closing appliances, - ballasting and stability, included seawater intake, - mooring and positioning, and for related safety systems which depend on emergency power or hydraulics. In addition comes information about how often one aims at doing inspections in dock.		
e) Operator's additional considerations and requirements with respect to inspection and maintenance as a result of extended life for - load-carrying structures with respect to fatigue, corrosion, erosion and thickness measurement, - critical areas, in addition to those required by the classification societies, - leak detection systems.	Section 11.1.1	The requirements are adequately described in the Information Duty Regulations and do not need further detail. A new standard on structural analyses for lifetime extension is currently being developed by OLF
f) Operator's use of information about past performance and relevant equipment usage, including results from similar facilities. This may require co-operation with other operators, ship owners and classification societies.	Section 15	This is related to finding best practice for lifetime extension
g) Operator's plans for replacement and need for repairs of load carrying structures and marine systems.	Section 11.1.1.	The requirements are adequately described in the Information Duty Regulations and do not need further detail.
h) Operator's identification of possible chain of events related to marine systems, identification of barriers in these chains of events, review of the effectiveness and reliability of barriers,	Not relevant to the application for fixed installations	

	identification of criteria for how long these barriers are to be considered satisfactory and identification of special criteria in case several barriers are impaired at the same time. Furthermore, a consideration of preventive measures that are possible to put into practice.		
i)	An assessment of how long one now thinks the facility can be used, or of the length of the life span in terms of safe operation of the facility. Identification of the circumstances that will limit the life span and specification of the criteria for safe operation to the extent it is possible to do so (e.g. permissible lengths of cracks, maximum permissible corrosion or remaining thickness, remaining anodes, degrading of paint protection).	Section 10 Section 11.1.1.	The requirements are mainly related to the load bearing structures and these are adequately described in the Information Duty Regulations.

Life Extension of Facilities

Drilling and Well systems - List of issues that may be addressed

The following elements should be considered during the assessments of continued safe drilling and well operations, but may not be applicable in all respects for all installations.

General considerations and requirements:

- Brief status on drilling facilities & wells, with description of current service life, technical condition, main capabilities, and conformity to current regulations/ exemptions. relevant incidents and Well Integrity KPI records expected to be followed up
- Main degradation mechanisms and corresponding control measures relating to "Safety Critical Equipment"
- Well integrity situation and potential changes in the related risk-picture (locally and towards other parts of the installation)
- Potential well stimulation, intervention & work over methods/ limits
- Future activity level and modification plans
- Future capabilities required to monitor, access, operate, maintain and abandon drilling- and well facilities during the extended lifetime
- Condition of utility systems to support future D&W activities
- Future capabilities to serve for potential "tie-ins" and specific measures for enhanced petroleum recovery in the area

Some other potential issues to be considered:

- Verification/analysis of load-bearing structures for such as derrick w/sub-structure, handling arrangements and well head strength.
- Condition of support arrangements for well/ wellhead/ conductors, (impact by wear, motion, subsidence)
- Plans for testing integrity of wells/ well barriers, for extended use
- Systematic checking for leakages and monitoring annulus pressures
- Impact/ degradation inside and outside of the well/ barrier envelopes (by H2S, CO2, other chemical, erosion, corrosion, deformation, fatigue, wear,...)
- Well control facilities and well killing capabilities
- Technical premises for potentially converting wells (e.g.: from production to injection,..), slot recovery demands and new wells/ well paths
- Potential impact on interfacing facilities/outfitting (e.g.: flow lines)
- Strategy relating to P&A
- Well integrity competence/ resources

Recommendations:

- Start developing the extension application early, and include Drilling & Well personnel from day 1. Agree on the scope, and consult with PSA professionals if uncertainties exist
- Emphasize proper verifications, realistic plans and committed execution
- Know how to adhere to Norsok D-010, and ensure Well Integrity assessments/ records is up-to date.
- Ensure drilling and well systems are sufficiently managed/ evaluated in this context