Asset Design Life Extension Program Guideline for Offshore Canada-Newfoundland and Labrador

Responsible Department Safety / Operations			
Document No: **2019-GL-001**	**Total # of Pages:** **20**	**Review Cycle:** **3 years**	**Revision No.:** **R1**
Comments:			

Revision Number	**Date Revised**	**Date Created**	**Prepared By**	**Checked By**	**Approved**

TABLE OF CONTENTS

TABLE OF ILLUSTRATIONS

DEFINITIONS

Please note: Any terms not otherwise defined below have their meaning as set out in the *Accord Acts* and Regulations.

Accord Acts: The *Canada–Newfoundland and Labrador Atlantic Accord Implementation Act* and the *Canada Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act*

Aging: Any aspect, which over time, adversely affects the ability of an installation's systems, structures or components to perform their desired function. This can include factors such as physical degradation, changes to the organization, process fluids, human factors, standards or obsolescence

Asset Integrity: The ability of an asset to perform its required function effectively and efficiently while safeguarding life and the environment

Asset Integrity Management: The means of ensuring that the people, systems, processes and resources, which deliver and maintain integrity, are in place, in use and fit for purpose over the lifecycle of the asset

Asset Life Extension: The period by which the operational life of an asset is extended beyond the originally defined design or service life while maintaining acceptable performance with respect to effectiveness, efficiency, safety and environmental protection and operating with an ALARP risk profile

Barrier: Means a technical/physical, human or organizational safeguard that is put in place to avoid, prevent, reduce or manage health, safety or environmental risks

Degradation: Often referred to as "*deterioration*" – A detrimental change from design or manufactured condition adversely affecting the ability of an item to perform the required function

Design Life: The duration of time that a production installation or fixed drilling installation system structure or component is designed to operate, i.e. the originally anticipated service life

Environmental Protection Plan: Has the same meaning as defined in section 9 of the *Newfoundland Offshore Petroleum Drilling and Production Regulations*

Floating Platform: A column-stabilized mobile platform or a surface mobile platform

Human Factors: Refers to environmental, organizational and job factors, and human and individual characteristics, which influence behaviour at work in a way that can affect health and safety

Life Extension Plan: A document that summarizes technical documents and assessments undertaken that dictate the planned activities and mitigation measures to meet the requirements of life extension

Life Cycle: The period from initial facility design and construction through to decommissioning and site remediation

Major Accident: An event that has the potential to cause the loss of life to multiple individuals (2 or more) or uncontrolled pollution

Mobile Platform: A platform that is designed to operate in a floating or buoyant mode or that can be moved from place to place without major dismantling or modification, whether or not it has its own motive power

Obsolescence: The transition from availability from the original manufacturer to unavailability

Operations Authorization: An authorization issued to an operator by the C-NLOPB pursuant to paragraph 138(1)(b) of the *Accord Act*

Operator: A person that holds an operating licence under paragraph 138(1)(a) of the Act and an authorization

Preliminary Life Extension Plan: The preliminary plan outlining potential actions to be carried out prior to entering Asset Life Extension

Safety Critical Elements: Means any equipment or system (including computer programs and temporary or portable equipment) critical to the safety and integrity of the installation or critical to preventing pollution from the installation and includes any equipment or system

a. that is intended to prevent or limit the effect of a hazard that would cause a major accident event; or
b. any equipment or system, the failure of which could:
    i. cause a hazard on the installation that would cause a major accident event; or contribute substantially to the effects of such a hazard on the installation

Safety Plan: Has the same meaning as defined in section 8 of the *Newfoundland Offshore Petroleum Drilling and Production Regulations*

Subsea Production System: Equipment and structures that are located on or below or buried in the seafloor for the production of oil or gas from, or for the injection of fluids into, a field under a production site, and includes production risers, flow lines and associated production control systems

Verified Service Life: Can be defined as the technical or economic limit for Safety Critical Elements or supporting systems

ABBREVIATIONS

AEOL	Anticipated Extended Operating Life
ALARP	As Low As Reasonably Practicable
ALE	Asset Life Extension
CA	Certifying Authority
Can-NL Offshore Area	Canada-Newfoundland and Labrador Offshore Area
COF	Certificate of Fitness
C-NLOPB	Canada-Newfoundland and Labrador Offshore Petroleum Board
EA	Environmental Assessment
EPP	Environmental Protection Plan
FPSO	Floating Production Storage and Offloading
GBS	Gravity Based Structure
LEP	Life Extension Plan
OA	Operations Authorization
PLEP	Preliminary Life Extension Plan
QRA	Quantitative Risk Assessment
RACI	Responsibility, Accountability, Consult and Inform
SCE	Safety Critical Elements
VSL	Verified Service Life

FOREWORD

The Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) has issued this guidance to assist an operator in developing and following an Asset Design Life Extension Plan. The onus is on the operator to comply with the *Accord Acts* and Regulations and to demonstrate to the C-NLOPB the adequacy and effectiveness of the methods employed to achieve compliance.

Guidelines are developed to provide assistance to those with statutory responsibilities (including operators, providers of service, suppliers, employers, employees, etc.) under the *Accord Acts*[1] and Regulations. Guidelines provide an understanding of how regulatory requirements can be met. In certain cases, the goals, objectives and requirements of the legislation are such that no guidance is necessary. In other instances, guidelines will identify a way in which regulatory compliance can be achieved.

Guidelines outline the Board's reasonable expectations on how those with statutory responsibilities can achieve compliance with *Accord Acts* and Regulations. The onus is on those with statutory responsibilities to comply with the legislation and to demonstrate to the Board the adequacy and effectiveness of the methods employed to achieve compliance. Operators are expected to engage with other authorities, as appropriate.

All statutory references in this guidance will be to the federal version of the *Accord Acts* (*Accord Act*) and Regulations, especially those related to certification of installations and, drilling and production.

The authority to issue guidelines and interpretation notes with respect to Regulations is specified by subsection 151.1(1) of the *Accord Act*.

The information set out in the guideline does not prevent the operator from proposing alternative methods or means to demonstrate compliance with the Regulations. In proposing different alternatives, it is expected that the operator will provide an assessment of the risks and hazards associated with their proposed alternative(s)

[1] *Canada-Newfoundland and Labrador Atlantic Accord Implementation Act*
Canada –Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act.

1.0 PURPOSE OF GUIDELINE

The purpose of this guideline is to provide additional information and guidance to the operators of production installations and/or fixed drilling installations on steps and phases to consider when evaluating a Life Extension Plan (LEP) to extend the design life of an installation in order to maintain compliance with regulatory requirements.

Asset aging can be understood and detected from inspection, analysis of failures and incidents, and industry information in respect of similar assets and components. After reviewing such information an asset operator may make a decision on how to, or whether to, proceed with extending operations in a safe manner beyond the installation's design life. The options can include developing a program to justify continued service, re-rating, repair, or retiring the equipment and ensuring the management system is reflective of these changes. Aging is not just about platform structures, pipework, and pressure vessels; it also includes control and instrumentation, software, staff demographics, skills, training and competencies as the workforce and technologies evolve beyond original expectations.

Execution of an LEP program ensures assets are being managed adequately and required improvements are identified and implemented. The LEP program may include systems to be upgraded or repaired and procedures to be updated; which are necessary for continued use of the asset.

Effective management of aging equipment and systems through an Asset Life Extension (ALE) program requires that all parties involved have a thorough understanding of the factors, the application and implementation of techniques to assess and then manage aging installations. These considerations should include but are not limited to:

- Aging / deteriorations
- Fatigue
- Changes to environmental loads
- Hazard profile change of installation
- Process and well condition changes over time
- Installation modification
- Obsolescence
- Technology and knowledge advances
- Limitations of monitoring programs and techniques

Outputs stemming from considerations should also be captured in the management system via the following mechanisms but are not limited to:

- A thorough review of the Operator's Safety Plan and Environmental Protection Plan
- Appropriate changes to key risk control systems and Safety Critical Elements (SCE)
- Reassessment of Quantitative Risk Assessments (QRAs) such as Fire & Explosion Risk Assessments

- Appropriately deemed inspection, maintenance and testing programs

2.0 STATUTORY AUTHORITY

Safety of Works and Activities
Section 138.2 of the *Accord Act*: The Board shall, before issuing an authorization for a work or activity referred to in paragraph 138(1)(b), consider the safety of the work or activity by reviewing, in consultation with the Chief Safety Officer, the system as a whole and its components, including its structures, facilities, equipment, operating procedures and personnel. Further, pursuant to Section 138(4) of the *Accord Act*, an authorization is subject to such approvals as the Board determines or as may be granted in accordance with the regulations.

Guidelines and interpretation notes
Subsection 151.1(1) of the *Accord Act*: The Board may issue and publish, in any manner the Board considers appropriate, guidelines and interpretation notes with respect to the application and administration of sections 45, 138 and 139 and subsection 163(1.01) and any regulations made under sections 29.1 and 149 of the *Accord Act*.

Deemed not to be statutory instruments
Subsection 151.1(2) of the *Accord Act*: Guidelines and interpretation notes issued pursuant to subsection (1) shall be deemed not to be statutory instruments for the purposes of the *Statutory Instruments Act*.

In the event of a perceived discrepancy between this Guideline and the legislation, an operator should consult with the Board and the *Accord Acts* and Regulations are to prevail.

3.0 OPERATOR'S RESPONSIBILITY

In accordance with Section 25 of *the Newfoundland Offshore Petroleum Drilling and Production Regulations* "The operator shall ensure that all wells, installations, equipment and facilities are designed, constructed, tested, maintained and operated to prevent incidents and waste under the maximum load conditions that may be reasonably anticipated during any operation."

It is the operator's responsibility to reduce risk to as low as is reasonably practicable (ALARP) in the context of the following:

- The operator's declaration to ensure facilities and equipment remain "fit for purpose" as part of its Declaration of Fitness provided pursuant to the *Accord Acts*.
- Paragraph 5(e) of the *Newfoundland Offshore Petroleum Drilling and Production Regulations* requires that operators' management systems include "the processes

for ensuring and maintaining the integrity of all facilities, structures, installations, support craft and equipment necessary to ensure safety, environmental protection and waste prevention."

- Section 19 of the *Newfoundland Offshore Petroleum Drilling and Production Regulations* requires that "The operator shall take all reasonable precautions to ensure safety and environmental protection."
- Section 27 of the *Newfoundland Offshore Petroleum Drilling and Production Regulations* requires that "The operator shall ensure that any defect in the installation, equipment, facilities and support craft that may be a hazard to safety or the environment is rectified without delay."

Further guidance respecting asset integrity management programs is provided under Section 25 of the *Drilling and Production Guidelines*. References to the design, operation and maintenance of specific systems and equipment are provided in the *Newfoundland Offshore Petroleum Drilling and Production Regulations*, *Newfoundland Offshore Petroleum Installation Regulations* and the *Canada – Newfoundland and Labrador Offshore Marine Installations and Structures Occupational Health and Safety Transitional Regulations*.

4.0 APPLICATION / SCOPE

This document is applicable to the management of aging and life extension associated with production installations and/or fixed drilling installations and applies to activities or proposed activities within the Canada-Newfoundland and Labrador Offshore Area (CAN-NL Offshore Area).

This guidance document addresses:

1. Key elements to consider when establishing the scope of the life extension project;
2. Considerations to be taken into account in planning and executing a life extension project; and
3. Regulatory engagement and submission requirements.

While systems are in place for managing asset integrity, maintenance, reliability and operations during the design or service life, as mandated by Regulation highlighted in Section 3.0 of this document, there are no explicit references to ALE. However, ALE is implicit by reference to the management of the asset life cycle illustrated in Figure 1. The operator's asset integrity management program is expected to include the explicit identification of safety critical elements and any equipment that is required by these regulations.

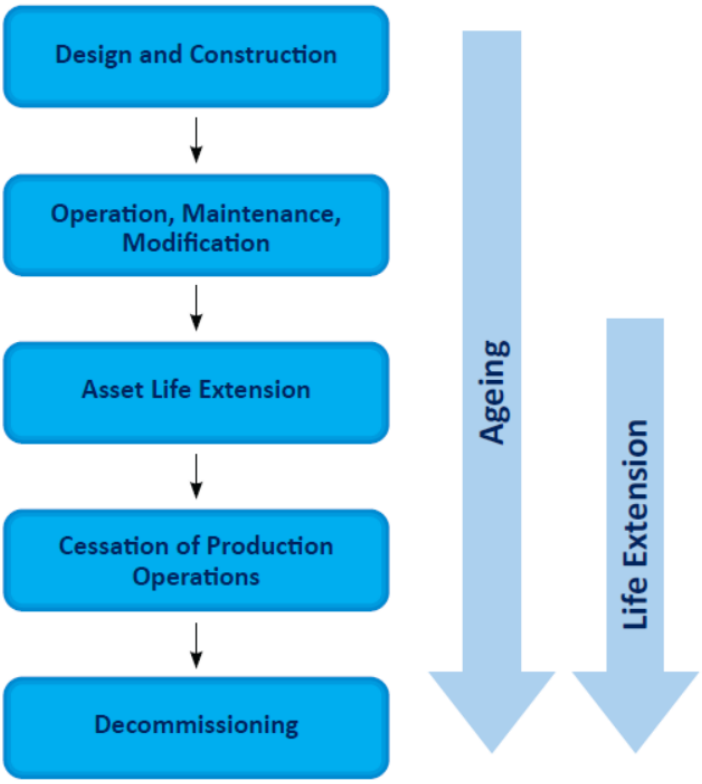

Figure 1: Asset Life Cycle Including ALE[2]

5.0 ASSET LIFE EXTENSION OVERVIEW

Production installations and/or fixed drilling installations within the CAN-NL Offshore Area are subject to the ongoing regulatory oversight of the C-NLOPB, including periodic Certificate of Fitness (COF) and Operations Authorization (OA) renewal. However, the operator of a production installation and/or fixed drilling installation may choose, for the purpose of long-term operation and in order to maximize the value of the asset, to implement an ALE program. Continued operation of the production installation and/or fixed drilling installation is largely dependent on the work that will be required for long term safe operation.

An ALE program may involve the replacement, upgrade or refurbishment of major components, or substantial modifications to the plant, or both. As such, these programs represent a commitment to long-term, continued operation of the installation.

In keeping with its regulatory mandate, the C-NLOPB expects the operator of a production installation and/or fixed drilling installation to demonstrate that the following objectives are met for any ALE program:

[2] Oil & Gas UK Guidance on the Management of Aging and Life Extension for UKCS Oil and Gas Installations – Issue 1 April 2012

1. The technical scope of the program is adequately determined, culminating in the development of an integrated life extension plan. Submission criteria towards life extension may include:

    a. Procedures and/or policies related to ALE
    b. Presentations on the scope of work to extend life
    c. Revision of Safety Plan, Environmental Protection Plan, Environmental Assessment, Benefits Plan Amendment and/or any other relevant plans or documentation
    d. Aging Asset Management program

2. A clearly defined communication plan between all relevant stakeholders at appropriate stages of development and execution of the LEP is provided in order to continue the alignment of activities within the plan.

3. Adequate processes should be in place to facilitate the following additional aspects:

    a. Workplace engagement
    b. Obsolescence
    c. Management System

The process for ALE as it relates to this guidance is illustrated in Figure 2.

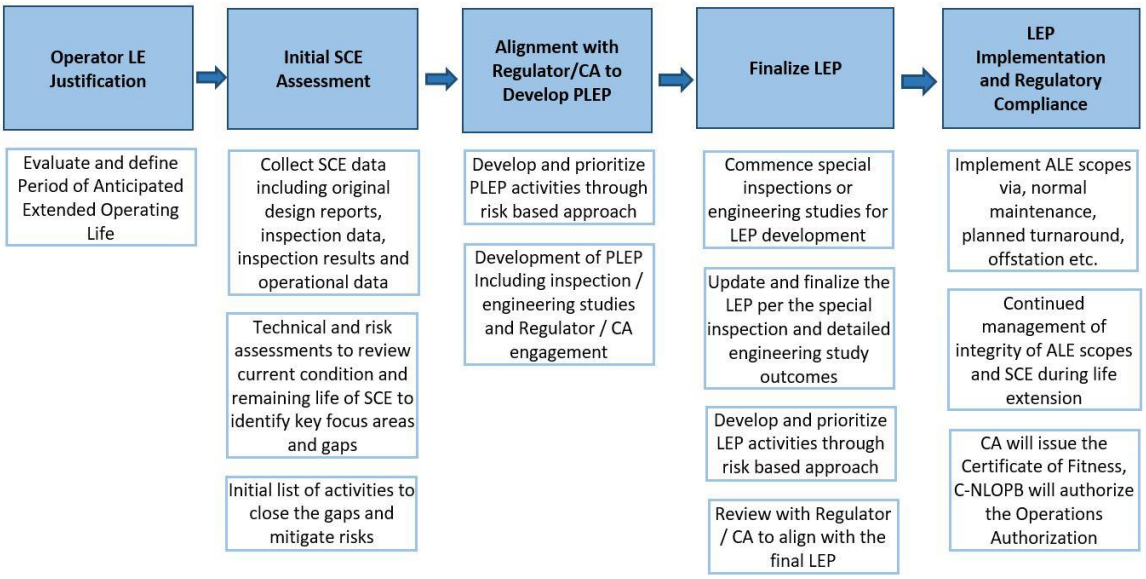

Figure 2: CAN-NL Offshore Area Process for ALE

Asset Life Extension of a production installation and/or fixed drilling installation is an integrated business process that requires the involvement of all functions supporting an asset working together. Engagement of all stakeholders including the Certifying Authority (CA) and regulatory bodies is imperative to ALE success through all stages. The operator should identify an organizational and governance structure including the CA and regulatory bodies to manage ALE and steward to the guidance presented in this

document. The Responsibility, Accountability, Consult and Inform (RACI) chart illustrated in Figure 3 should be referenced during this process.

Activity	Key Activities	Operator	CA	C-NLOPB
Operator LEP Justification	Evaluate and define Period of Anticipated Extended Operating Life	A/R	I	I
Initial SCE Assessment	Collect SCE data including original design reports, inspection data, inspection results and operational data	A/R	I	I
	Technical and risk assessments to review current condition and remaining life of SCE to identify key focus areas and gaps	A/R	I	I
	Initial list of activities to close the gaps and mitigate risks	A/R	I	I
Alignment with Regulator/CA to Develop PLEP	Develop and prioritize PLEP activities through risk based approach	A/R	I	I
	Development of PLEP including inspection/ engineering studies and Regulator / CA engagement	A/R	C	C/I
Finalize LEP	Commence special inspections or engineering studies for LEP development	A/R	I	I
	Update and finalize the LEP per the special inspection and detailed engineering study outcomes	A/R	I	I
	Develop and prioritize LEP activities through a risk based approach	A/R	I	I
	Review with Regulator / CA to align with the Final LEP	A/R	C	C/I
LEP Implementation and Regulatory Compliance	Implement LEP scopes via normal maintenance, planned turnaround, offstation etc.	A/R	C	I
	Continued management of integrity of ALE scopes and SCE during life extension	A/R	C	I
	CA will issue the Certificate of Fitness, C-NLOPB will authorize the Operations Authorization	C	A/R	A/R

R	The party who does the work to achieve the task. Delegated to by those who are accountable.
A	The party ultimately answerable for the correct and thorough completion of the task.
C	Those who's opinions are sought, and with whom there is two way communication.
I	Those who are kept informed and updated on progress.

Figure 3: RACI Chart Engagement and Governance

6.0 OPERATOR LIFE EXTENSION JUSTIFICATION

6.1 Evaluate and define period of Anticipated Extended Operating Life (AEOL)

Extending operations beyond the design or service life is desirable when the economics associated with the recovery of hydrocarbons remains positive; this could be in relation to an original reserve estimate increase or the discovery of additional opportunities that can be recovered with the support of existing infrastructure. Each operator is responsible for resource development and any associated business case for continued extraction. This may indicate that a life extension beyond the original design or service life is necessary. An output from this business case will be to evaluate and define the period of AEOL.

7.0 INITIAL SAFETY CRITICAL ELEMENTS ASSESSMENT

7.1 Collect SCE Data

Management of life extension involves continual assessment of SCE and supporting systems to determine how condition(s) are changing over time. These assessments of SCE data include original design reports, inspection data, inspection results and operational data and are in addition to those normally carried out to assure the technical integrity of the installation. The first step in the assessment will be a review of the original design basis documents and operational data including the installation maintenance and inspection records. It will also include input from all functions supporting an asset to ensure that any equipment, procedural or human factors associated with life extension (not typically tracked by the operator's maintenance management system) are captured.

7.2 Establish Verified Service Life (VSL)

The installation's original design basis should have specified a design or service life and, in theory, set a date for when all the SCE or supporting systems reach their end of design or service life. The design or service life is derived as a means to prevent failure during operation due to time-dependent degradation mechanisms such as corrosion and fatigue. The expiry of the design or service life does not automatically mean that the SCE or supporting systems are no longer fit for purpose beyond that expiry. In some cases, the design or service life will be a fixed term based upon calculation, for example, fatigue life. In other cases, it will be less predictable, and some judgment will be required to arrive at a design or service life, for example, based on actual and predicted condition. The review of SCE data including original design reports, inspection data, inspection results and operational data will be necessary at this stage.

Assessments, either technical or risk, should be utilized to establish a VSL for all SCE and supporting systems including, but not limited to:

- Structures
- Production Systems
- Marine Systems
- Pipelines and Subsea

- Drilling Systems
- Safety and Environmental Systems
- Wells
- Electrical Systems
- Pressure Systems
- Control and Instrumentation
- Mechanical Handling systems
- Communications systems

The establishment of a VSL will validate remaining life, and it should take into account the original design, current condition assessments and future predicted operating regimes of the asset out until the AEOL and should assess potential aging mechanisms including, material degradation, obsolescence and any potential human factors.

7.3 Establish Preliminary Life Extension Plan (PLEP)

Up to the VSL, the system is deemed fit for purpose under normal inspection and maintenance routines. Beyond a VSL, risks increase with respect to failure, reliability or demands on maintenance. Therefore, an initial list of activities to close gaps and mitigate risks should be developed.

VSL can be defined as the technical or economic limit for SCE or supporting systems. Once the initial work to establish a VSL is completed, there are three possible outcomes:

1. VSL is unable to be established and a more in-depth study is needed - an example of this would be fatigue assessment of a Floating Production Storage and Offloading (FPSO) hull or Structural Assessment of a Gravity Based Structure (GBS).
2. The VSL is at or beyond the AEOL, therefore no further work is needed other than regular maintenance as prescribed in the relevant operator's maintenance strategy or plan.
3. The VSL falls short of the AEOL and further work is needed to determine the strategy for how the SCE or supporting system can remain fit for purpose to the AEOL. These strategies could include:
    - Continue to operate but with an enhanced maintenance / inspection regime that addresses the aging threats.
    - Undertake a refurbishment of the equipment or system so that it can operate to the AEOL with a normal maintenance / inspection regime.
    - Replace equipment or system, resetting the clock in terms of service life.

The outcomes of 1 & 3 will effectively form the list of gaps and the basis for the PLEP.

The PLEP will list gaps identified from the technical and risk assessments and include the actions required to develop the necessary mitigation measures, which ultimately will form part of the final Life Extension Plan (LEP). The PLEP should include at a high level a stakeholder engagement plan, presentations and updates on ALE activities. The PLEP may also include:

1. ALE Strategy
2. System Review Processes (SCE Assessments)
3. Plans for Technical Studies
4. Early Identified Gaps

7.4 Develop and Prioritize PLEP Activities

Understanding that mitigations may vary in magnitude, the PLEP should be prioritized by identifying those activities that have the largest effect of reducing risk. A number of tools are available for this dependent on the complexity of any identified gap(s). The operator shall be responsible for establishing a risk-based prioritization method.

8.0 ALIGNMENT WITH REGULATOR / CA TO DEVELOP PLEP

The operator shall outline their PLEP for demonstration of due diligence in the review and repair process to enable ALE of the installation. Once committed, the operator is expected to steward the plan as committed.

Early engagement with the C-NLOPB may include workshops, presentations and/or plan submittals. It is encouraged that engagement commence at least two years prior to the last OA renewal before design life expires and at least five years before the end of design life. Operators should be engaging the Regulator on the possibility of a LEP as soon as possible.

A review of the PLEP must be carried out with the CA to ensure alignment on the assessments, gaps identified, and the recommended mitigation measures. The CA must verify that the PLEP is adequate to maintain the integrity of the installation. Regulatory engagement of this alignment is necessary at this point.

9.0 FINALIZE LIFE EXTENSION PLAN

9.1 Update and Finalize LEP

From the special inspections or engineering studies completed as identified in the PLEP, define the VSL for remaining SCE and supporting systems. Once the VSL is established, there are two possible outcomes:

1. The VSL is at or beyond the AEOL; therefore, no further work is needed other than regular maintenance as prescribed in the operator's relevant maintenance strategy or plan.

2. The VSL falls short of the AEOL, and further work is needed to determine the strategy for how the SCE or supporting system can remain fit for purpose to the AEOL. These strategies could include:

    - Continue to operate but with an enhanced maintenance / inspection regime that addresses the aging threats.

- Undertake a refurbishment of the equipment or system so that it can operate to the AEOL with a normal maintenance / inspection regime.
- Replace equipment or system, resetting the clock in terms of service life.

During this particular phase, all actions derived from studies, inspections, regulatory / CA input and class rule changes need to be outlined in the LEP. The plan should include all the actions necessary to ensure SCE and supporting systems continue to provide the acceptable level of protection with respect to Major Accident Hazards. The expectation of the plan would be to continue to maintain the installation at ALARP through to the AEOL.

9.2 Develop and Prioritize LEP Activities

Understanding that mitigations may vary in magnitude, the LEP should be prioritized using a risk-based approach in identifying activities that have the largest effect of reducing risk. A number of tools are available for this dependent on the complexity of the gap; operator shall be responsible for establishing a risked based prioritization method.

9.3 Review with Regulator / CA to Align with the Final LEP

The operator shall update the LEP. The LEP will list the gaps identified from the technical and risk assessments and include the outputs from the PLEP. It should contain the actions to develop the necessary mitigation measures including campaign options.

The LEP should include at a high level:

- Task list and durations with the expected outcomes
- Stakeholder engagement plan - presentations / updates on LEP activities

A review of the finalized LEP will be carried out with the CA to ensure alignment on the assessments, gaps identified, and the recommended mitigation measures. The final LEP scope, including confirmation of CA concurrence, is to be submitted to the C-NLOPB for acceptance.

10.0 LEP IMPLEMENTATION AND REGULATORY COMPLIANCE

The C-NLOPB expects the operator to execute the LEP work scopes via normal maintenance, planned turnaround and/or off station or other campaign options identified in the LEP to achieve and demonstrate compliance with the *Accord Acts* and Regulations.

11.0 ASSET INTEGRITY OF LEP SCOPES AND SCE DURING LIFE EXTENSION

Continued management of asset integrity of LEP scopes and SCE needs to be ongoing during asset life extension. The operator will demonstrate that all SCE and supporting systems are properly maintained and remain fit for purpose and that there are no unmanageable safety risks or potential negative environmental impacts such as pollution or debris. This is to be validated by the CA and communicated to the C-NLOPB.

12.0 COF AND OA APPROVAL REQUIREMENTS

The C-NLOPB cannot issue an OA without an approved COF issued from the CA. A LEP summary document, including assessments, data and methodologies utilized to support a decision to operate into a period of life extension should be completed to support the COF and OA that precedes the life extension. It should also be demonstrated that all LEP activities that need to be completed before the commencement of life extension period are either completed, being executed or planned such that they will be addressed prior to entering into life extension.

The LEP summary document to support any asset life extension program could include:

- Schedule of planned ALE scope
- Findings from the performed gap analysis
- The plans to address the gaps, such as:
    - Necessary changes and modification, upgrades / replace in kind
    - Necessary updates in maintenance, inspection programs and performance requirements

Documents as required as part of the OA Application by the *Newfoundland Offshore Petroleum Drilling and Production Regulations* should be revised as applicable to reflect the ALE program.

12.1 Safety Plan Expectations

Upon renewal of an OA, it is expected that the operator's safety plan and any revisions to the plan for aging installations include such topics as:

- Defined timeframes of SCE inspections and risk assessments specifically for aging issues
- Structural integrity assessments
- ALARP demonstration
- Fire and explosion risk assessments
- Design parameter identifications
- Aging processes
- Changes in operating conditions and any performance standards that may limit the life of the installation, or of its SCE

12.2 Environmental Protection Plan Expectations

Upon renewal of an OA, it is expected that the operator's EPP and any revisions to the plan for aging installations include such topics as:

- Defined timeframes of SCE inspections and risk assessments specifically for aging issues
- Changes in operating conditions and any performance standards that may limit the life of the installation, or of its SCE.

13.0 ENVIRONMENTAL ASSESSMENTS

Environmental assessments, conducted prior to project commencement, include temporal scope limitations, expectations for environmental performance of assets and predictions about impacts that will be detected in the environment. Any ALE program intended to extend the life of an asset beyond the design life and, by extension, the temporal scope of an existing environmental assessment must consider the expectations laid out in that assessment and the ability of the aging asset to meet them. An operator will be expected to verify that predictions regarding environmental effects and the effectiveness of associated environmental mitigations remain valid and current. As well, changes to environmental regulations and expectations (i.e. best practice) will have to be considered.

The C-NLOPB has determined that, to extend project life beyond the original temporal scope of the associated environmental assessment, an operator should provide a concise EA Validation Report. The C-NLOPB will not consider ALE Programs that extend the project temporal scope beyond the originally assessed scope unless the operator has provided the validation report and the C-NLOPB has determined that the predictions of the original EA will remain valid for the life of the temporal extension.

14.0 ADDITIONAL REGULATORY EXPECTATIONS

The C-NLOPB expects that a number of equipment operationally or age incurred anomalies be resolved and repaired prior to the approval of extended life period of all installations:

1. All temporary repairs including clamps, wraps, composite wraps and other equivalent solutions shall be replaced by like for like or upgrade solution prior to entering life extension period;
2. Tertiary steel structures and pipe supports should undergo integrity assessment as part of the ALE process;
3. Training and competency requirements for upgraded equipment
4. Management of equipment obsolescence; and
5. Any other equipment that may have an impact to safety, the environment or resource conservation is maintained.

The C-NLOPB also expects that the operator engages with its workforce through all aspects of the ALE process and addresses their concerns accordingly.

Regulatory compliance must still be maintained until the installation has reached the end of life and completed decommissioning. The onus is on the operator to comply with the Regulations and to demonstrate to the C-NLOPB the adequacy and effectiveness of the methods employed to achieve compliance. It is the regulatory expectation that all

operators strive to achieve the highest level of industry standards in achieving asset life extension.

REFERENCES

1. 122 – Norwegian Oil and Gas Recommended Guidelines for the Management of Life Extension
2. Energy Institute Guidance for Management of Aging Safety and environmental critical elements
3. Guidance on management of ageing and thorough reviews of installations – Offshore Information Sheet No.04/2009
4. Oil & Gas UK Guidance on the Management of Aging and Life Extension for UKCS Oil and Gas Installations – Issue 1 April 2012
5. Oil & Gas UK Guidance on the Management of Aging and Life Extension of off Offshore Structures – Issue 1 May 2014
6. Oil & Gas UK Guidance on the Management of Aging and Life Extension Aspects of Electrical, Control & Instrumentation Equipment – Issue 1 May 2014