

PAME I-2019: Agenda 7.2(c)
PAME Offshore Oil and Gas Project 2019-2021
Preliminary Concept Paper

3. Guidance on Non-Emergency Operations, Monitoring, and Decommissioning/Site Clearance

In response to periodic review of the guidance contained in the 2009 Arctic Offshore Oil and Gas Guidelines, recognizing that EPPR has the mandate for the emergency topics covered in the 2009 AOOGG, and further recognizing the new Arctic Offshore Regulator Forum and their focus on operational issues, the PAME Resource Exploration and Development Expert Group (REDEG) determined that updating sections (4) Environmental Monitoring, (5.2) Compliance Monitoring, (6.1) Waste Management, (6.2) Use and Discharge of Chemicals, (6.3) Emissions to Air, and Decommissioning and Site Clearance (8.0) was a useful objective.

Key Objectives

This project proposal is driven by the recent increase in offshore oil and gas activities coupled with the age of the recommendations-10 years old. In addition, although the guidance in the AOOGG 2009 is considered good, it was the bare minimum that could be considered useful. The topics above amounted to a mere 9 pages. It is time to revisit these guidelines and see what needs updating and possible elaboration.

Scope

Following is an outline of recommendations from the AOOGG 2009 on Non-Emergency Operations and Practices of Waste Management, Discharges, Emissions, Monitoring, and Decommissioning of offshore oil and gas activities. These recommendations total about 9 pages.

Non-Emergency Operations and Practices (Sections 4, 5, 6 and 8; currently 9 Pages)

Monitoring (17 Recommendations)

- Aims and objectives
- Environmental monitoring methods
- Standards and practices for environmental monitoring
- Following up environmental monitoring
- Compliance monitoring, auditing and verification

Waste Management (20 Recommendations)

- Examples of Recommended Preventative Management Techniques
- Management Techniques for Drilling Wastes and Production Effluents
 - Waste from Drilling Activities
 - Production Waste Discharges
 - Fluid Waste from Well-Testing
 - Solids and Domestic Wastes
 - Sanitary Waste
 - Hazardous Waste Handling and Disposal

The use and discharge of chemicals (4 Recommendations)

- Biodegradability

- Bioaccumulation
- Acute toxicity
- Assessing chemical risk

Emissions to air (4 Recommendations)

- Energy efficiency
- Policy instruments to reduce emissions/discharges from petroleum activities
- Emissions from flaring
- VOC emissions
- Best Available Techniques (BAT)

Decommissioning and Site Clearance (6 Recommendations)

These guidelines were to be updated periodically. The 1997 Guidelines stated in Section 1.7 Periodic Review, “*These Guidelines should undergo periodic review and amendment, as necessary, to take into consideration experiences in the management and control of offshore oil and gas operations. The Guidelines must remain current if they are to support timely and effective measures for protection of the Arctic environment. An Experts Meeting should be held after the third anniversary of the adoption of the Guidelines to review and update them.*”

In response, these guidelines have been updated in 2002 and 2009. In 2014, the sections on health, safety and the environment and safety culture were updated in the AOOGG 2014 Systems Safety Management and Safety Culture Report.

This project will partially or substantially respond to the following AMSP 2015-2025 Goals and Strategic Measures.

7.1 Improve and Expand the Knowledge-base,

GOAL 1 Improve knowledge of the Arctic marine environment, and continue to monitor and assess the current and future impacts on Arctic marine ecosystems.

Strategic actions:

7.1.2 Improve, synthesize, and respond to emerging knowledge.

7.1.3 Improve the understanding of cumulative impacts on marine ecosystems.

7.1.7 Continue the development and standardizing of data sharing and management.

7.1.9 Strengthen, where feasible, the collection, observation, monitoring and dissemination of relevant data.

7.1.10 Strengthen the development of circumpolar procedures for remote sensing to support ice detection, monitoring, and forecasting.

7.1.11 Support continued development of circumpolar indicators of changes and stressors.

7.2 Conserve and Protect Ecosystem Function and Biodiversity

GOAL 2 Conserve and protect ecosystem function and marine biodiversity to enhance resilience and the provision of ecosystem services.

Strategic actions:

7.2.1 Promotion of the implementation of the ecosystem approach to management

7.2.2 Identify and assess threats and impacts to areas of heightened ecological and cultural significance and how such areas may be influenced by human induced changes and activities.

7.2.3 Identify and develop tools and methodologies for assessing cumulative impacts and risks.

7.2.9 Create inventories of and reduce emissions of short lived climate forcers, in particular black carbon and methane.

7.3 Promote Safe and Sustainable Marine Resource Use

GOAL 3 Promote safe and sustainable use of the marine environment, taking into account cumulative environmental impacts.

7.3.1 Advance EBM as an overarching framework for conservation and sustainable use of living and non-living resources in the Arctic marine Environment.

7.3.2 Improve the understanding of risks related to Arctic oil and gas exploration and development activities.

7.3.3 Explore whether there are substances in addition to oil that would benefit from additional pollution preparedness and response.

7.3.6 Advance continuous improvement of safety and environment protection performance and the use of best and most appropriate practices and technology for all marine activities.

7.3.7 Support and enhance international efforts and cooperation to continue to identify, assess and reduce existing and emerging harmful contaminants.

7.3.8 Promote the management of human activities in accordance with Ecosystem Based Management and international law.

7.3.9 Strengthen the development of a common Arctic protocol for ecotoxicological assessment and screening of chemicals used in resource extraction activities in the Arctic.

7.3.12 and 7.3.13 Strengthen the dialogue with relevant business, industry and environmental stakeholders and Arctic inhabitants in order to foster conservation and sustainable use of the Arctic marine environment.

Main Components and Implementation

The REDEG has distributed a survey to PAME members to see if there is interest in updating guidance from the AOOGG 2009.

Discussion

- Are there Gaps in the recommendations?
 - Waste Management?
 - Discharges?
 - Emissions?
 - Decommissioning and Site Clearance?
 - Environmental Monitoring?
 - Compliance Monitoring?
- Are any recommendations in need of an update or expansion?
- Are any of these issues being addressed in other AC working groups, Task Forces, or the Arctic Offshore Regulators Forum?
- Are any of these items in need of some coordination with other AC working groups, Task Forces, or the AORF to fully cover issues that may have overlap?
- Do we choose some or all of the above topics (with perhaps partial coverage for some, in coordination with what others are doing)?

Once it is determined that some or all of the sections are in need of updating and/or elaboration, the REDEG will start the process of asking for revisions of existing text or new text. The REDEG will proceed to negotiate the updated and expanded guidelines. The REDEG will meet at each PAME meeting and carry on their work via electronic communications intersessionally. There will be a workshop to bring together Arctic States experts.

Depending on what is decided to include in this project, it may be useful to reach out to experts in the varying sections topics, as contributors. This could include experts from AMAP, CAFF and EPPR, members of AORF and OSPAR, representatives of International Oil and Gas Producers and International Association of Drilling Contractors and possibly others.

Timeline and Major Milestones (TBD):

January - February 2019 - project team will review survey results and determine which sections of the Arctic Offshore Oil and Gas Guidelines could be updated. Project team will draft and submit the final project plan for inclusion in the PAME Workplan 2019-2021.

June 2019 – Project launched

September 2019 - (TBD) Possible Workshop

Winter 2020 - PAME I – 2020 - First Draft of Updated Guidelines

February 2021 - PAME I -2021 Final Draft of Updated Guidelines

May 2021 - Finnish Ministerial – adopted by the Ministers

Leads/Co-leads: USA (and Russia, Greenland, Canada...? TBD)

Inclusion/involvement/contribution by Permanent Participants:

✓ Have Permanent Participants been engaged in the development of the project proposal?

- **Yes**
- No

If no, why? (Please describe in 2-3 lines)

If yes, please describe any role that Permanent Participants will have in the project. (Please describe in 2-3 lines) (TBD)

✓ Will the use of TLK lead to better project outcomes?

- **Yes**
- No

If yes, explain how TLK will be used in the project. (Please describe in 2-3 lines) (TBD)

If no, provide an explanation why TLK is not applicable or feasible for this project.

Attached below are all of the recommendations and/or guidance contained in the Arctic Offshore Oil and Gas Guidelines. Consisting of two tables from AOOGG (Annex E: Overview of Offshore Activities and Potential Environmental Effects; and Annex H: Example of a Generalized Monitoring Plan) that may be considered for review. And tabular listing of the recommendations from the AOOGG 2009 on Waste Management, Use and Discharge of Chemicals, Emissions to Air, Decommissioning and Site Clearance, Environmental Monitoring, and Compliance Monitoring.

ANNEX E-Overview of offshore activities and potential environmental effects

Activity	Possible Causes	Potential environmental effects
Evaluation Seismic activity	Noise	Effects on fish, sea birds and marine mammals such as avoidance behavior.
Exploration Rig emplacement Drilling	Dredging, filling, anchoring, and/or rig set-down. Discharges of drill cuttings, drill fluids, excess cement, platform drainage, household discharges and emissions of exhaust gases. Discharges from supply vessels, helicopter transportation, etc. Risk of blowouts.	Seabed disturbance. Predominantly local effects on living resources. Potential effects on living resources such as birds and marine mammals, as well as susceptible areas of the coastal zone.
Development and production Facility and pipeline installation Drilling Production	Potentially more dredging, filling and anchoring. Extended risk of blowouts and oil spills. Discharges of produced water. Emissions of gases. Spills, discharges and emissions connected to transportation (tankers, supply vessels, pipelines etc.).	Long and short-term seabed disturbances. As under exploration, but more extensive in both the water column and air. Potential effects on the reproduction of fish and possible contribution to climate effects, acidifying effects, etc. Additional risks of effects on the marine environment and atmosphere.
Decommissioning and reclamation Removal of installations Leaving artificial islands or partial installations in-place	Cutting piles containing oil and chemicals, dredging, air emissions, noise, etc. Exposed Biophilic substrate or surfaces.	Seabed disturbance, possible effects on fish, sea birds and marine mammals. Development of habitat for fish, mammals and/or birds.

Annex E from the AOOGG 2009

ANNEX H-Example of a Generalized Monitoring Plan

Region	Installation	Phase	Type of investigation	Part of environment	Elements to be included	Frequency
		planning for development				
		development	baseline	Seabottom and other as relevant	inventory of biota, contaminants	every year and as frequent as necessary, depending on the type of activity
		production	monitoring	Seabottom and other as relevant	physical disturbance, biota, contaminants	every year and as frequent as necessary
		Decommissioning	monitoring	Seabottom Water column, as relevant	levels of contaminants and effects on biota, as relevant	during operations and once at reclamation phase
Region II						
	<i>Inst. 1</i>					
	<i>Etc</i>					
	<i>Etc</i>					
	<i>Etc</i>					
Etc	National shelves should be divided into regions where monitoring of the individual installations is coordinated. Regional monitoring of the water column is coordinated for the entire shelf of each country.					

Annex H from the AOOGG 2009

AOOGG 2009 Recommendations and Guidance for Non-Emergency Operations (Waste Management, Use and Discharge of Chemicals, Emissions, Environmental Monitoring, and Compliance Monitoring and Decommissioning/Site Clearance

Waste Management

AOOGG, 2009: Section 6.1	Waste management should be included in the overall planning from the beginning and combined with pollution prevention measures.
AOOGG, 2009: Section 6.1	Waste management should be included in the overall planning from the beginning and combined with pollution prevention measures. Prevention and elimination of these discharges and emissions, which pose pollution threats to the Arctic environment, should be a targeted goal of regulatory activity. New technology makes this goal achievable in some situations.
AOOGG, 2009: Section 6.1	Arctic governments should set discharge standards.
AOOGG, 2009: Section 6.1	The operator should to the extent possible avoid generation of waste. Any waste generated should be handled in an environmentally and hygienically adequate manner.
AOOGG, 2009: Section 6.1	Solid waste should not be discharged into the sea.
AOOGG, 2009: Section 6.1	The operator should prepare a plan connected to waste, including possibilities for waste reduction, waste segregation, reuse, recycling, energy recovery or treatment. The need for enhanced onshore infrastructure should be looked into.
AOOGG, 2009: Section 6.1	Recommended Preventative Management Techniques: consider no discharge of the main waste streams at the planning and construction stage, in particular drilling waste and produced water; reduce waste at the source by process modification, material elimination, material substitution, inventory control and management, improved housekeeping, and water recovery; reuse of materials or products such as chemical containers, and oil-based or synthetic-based drilling fluids; recycle/recovery by the conversion of wastes into usable materials and/or extraction of energy or materials from wastes such as recycling scrap metal, recovery of hydrocarbons from tank bottoms and other oily sludge, burning waste oil for energy, and the use of produced water for enhanced recovery; reduce toxicity of effluents through the careful selection of drilling fluids and chemical products used in separation equipment and wastewater treatment systems; perform radiation surveys of equipment and sites to prevent or minimize the spread of Naturally Occurring Radioactive Materials (NORM); and where NORM-scale formation is anticipated, use scale inhibitors to minimize or prevent the buildup of radioactive scale in tubulars.
AOOGG, 2009: Section 6.1	Where water-based drilling fluids are employed, additives containing oil, heavy metals, or other substances with negative ecotoxicological properties should be avoided or removed prior to discharge. Persistent and toxic substances should be avoided.
AOOGG, 2009: Section 6.1	Criteria for the maximum allowable concentration of harmful or hazardous substances should be established.

AOOGG, 2009: Section 6.1	If the option of land disposal is used, then both the properties of the drilling fluid and the environmental conditions at the proposed disposal site should be carefully considered to determine acceptability of the disposal site.
AOOGG, 2009: Section 6.1	Regulators and the industry should give consideration to the options for reduction and possible elimination of produced water discharged to the sea through the application of BAT, for example, injection, down hole separation or water shut-off. The focus should be on reducing the volume of discharges of produced water with the highest loads of oil and other substances.
AOOGG, 2009: Section 6.1	Regulators and industry should ensure that BAT and BEP are implemented on each platform and that BAT and BEP are regularly reviewed.
AOOGG, 2009: Section 6.1	Regulators and industry should ensure that new offshore platforms or major modifications to existing platforms should consider design changes that minimize discharges, and preferably aspire to produced water not being discharged at all.
AOOGG, 2009: Section 6.1	Deck wash and chemical/fluid releases are another concern to the marine environment, especially where oil-based drilling fluids are in use.
AOOGG, 2009: Section 6.1	A facility plan should be developed to address these potential conditions and methods of spill control and leak minimization should be incorporated into facility design and maintenance procedures.
AOOGG, 2009: Section 6.1	Facility plans, minimization efforts and controls shall be applied to, but not limited to, material storage areas, loading and unloading operations, oil/water separation equipment, wastewater treatment, waste storage areas, and facility runoff management systems.
AOOGG, 2009: Section 6.1	The availability of adequate disposal facilities should be ensured prior to allowing an activity to generate hazardous wastes.
AOOGG, 2009: Section 6.1	Hazardous wastes requiring transport to a disposal site should be packaged, labeled, and transported in conformity with generally accepted and recognized international rules and standards in the field of packaging, labeling, and transport. Due account should be taken of relevant internationally recognized practices. Transported hazardous wastes should be accompanied by a movement document from the point at which movement commences to the point of disposal.
AOOGG, 2009: Section 6.1	Disposal of solid and domestic wastes should be done in conformity with international law, such as MARPOL 73/78, and national legislation.
AOOGG, 2009: Section 6.1	Sanitary wastes such as sewage and gray waters should be processed according to international or local government standards prior to discharge into the marine environment. Processing in an acceptable sanitary waste treatment unit will generally properly treat waste streams prior to discharge.

Use and Discharge of Chemicals

AOOGG, 2009: Section 6.2	All substances in chemical preparations should be tested for their ecotoxicological properties such as potential for bioaccumulation, biodegradation rate and acute toxicity. The tests should be performed by laboratories that are approved in accordance with established international standards, for example, OECD's principles for good laboratory practice (GLP) or equivalent.
AOOGG, 2009: Section 6.2	The operators should ensure that risk evaluations are done based on the chemicals' intrinsic properties, time, place and amounts of discharge, and also other conditions of significance for the risk. The operator should choose the chemicals which according to environmental risk evaluations poses the lowest risk of harming the marine environment.
AOOGG, 2009: Section 6.2	The operator should have plans to ensure that hazardous chemicals are substituted with substances which pose less risk of harm to the environment. The plans shall give a description of which chemicals are prioritized to replace, and when this can take place.
AOOGG, 2009: Section 6.2	Chemicals should be stored in a safe and prudent way.

Emissions to Air

AOOGG, 2009: Section 6.3	Flaring permits can be issued after a thorough assessment of environmental considerations and evaluations in accordance with technology, economy, resources, safety, infrastructure, jurisprudence etc. The regulators should early in the process of awarding licenses specify what the operators must expect with regard to limiting flaring of associated gas.
AOOGG, 2009: Section 6.3	Some gas may be utilized for power production at the installation, but if a large amount of gas is produced, possible solutions may be injection into the reservoir or export through pipelines. Every effort should be made to flare only where necessary for safety purposes.
AOOGG, 2009: Section 6.3	The regulators can apply terms and conditions when awarding licenses, as requirements connected to EIAs, in emission or discharge permits, and/or in production permits. Such terms may include taxes on emissions of CO ₂ and NO _x . Using such economic measures may be used to enhance power generation efficiency and reduce emissions.
AOOGG, 2009: Section 6.3	All large combustion plants offshore (both existing and new) should apply integrated prevention and reduction of pollution. This implies application of Best Available Techniques (BAT). Regulators should refer to BAT when discharge limits are set in the discharge permits, and reflect what levels of reduction can be achieved without a definite resolution on what technology to use.

Decommissioning and Site Clearance

<p>AOOGG, 2009: Section 8</p>	<p>Plans for decommissioning should be incorporated at the design phase of a development and reviewed again when the facility is no longer needed for its current purpose. These plans should involve both technical considerations and financial provisions required to undertake the activity and any post-abandonment clearance and/or monitoring work.</p>
<p>AOOGG, 2009: Section 8</p>	<p>A decommissioning plan should be site- and condition-specific and should take into account sound science and field experience and balance environmental, safety, health, economic and technological factors as well as any constraints imposed by intergovernmental agreements. It is noted that those Arctic States that are Contracting Parties to the OSPAR Convention have agreed to a binding package of measures (via OSPAR Decision 98/3) which generally prohibits disposal of installations at sea, but which allows for derogation from this prohibition in a limited number of instances. These include leaving in place the footings of a large steel jacket platform (with a jacket weight in excess of 10,000 tons) as well as a broad exemption for gravity-based concrete structures for which leaving in place and/or disposal at a designated site may be considered.</p>
<p>AOOGG, 2009: Section 8</p>	<p>Other Arctic States will need to take into account the provisions of the London Convention (1972) or the 1996 Protocol to that agreement where full or partial disposal at sea (including toppling and leaving in place) is considered. For both the 1972 and 1996 agreements, Contracting Parties to the London Convention (1972) have adopted specific guidelines for disposal of platforms.</p>
<p>AOOGG, 2009: Section 8</p>	<p>In addition to these agreements dealing with the special case of disposal of platforms, the International Maritime Organization has adopted “Guidelines and standards for the removal of offshore installations and structures on the continental shelf and in the Exclusive Economic Zone” (Resolution A.672(16))” which govern safety of navigation. Amongst other things, the guidelines state that for structures placed on the seabed after 1998, complete removal should be feasible.</p>
<p>AOOGG, 2009: Section 8</p>	<p>Decommissioning plans should be developed in consultation with the competent authorities and stakeholders, including indigenous residents, fishing groups and other interested parties. The decommissioning plan should address both the facilities and the environment. (The London Convention (1972) Waste Assessment guidance is a useful reference in this regard.)</p>
<p>AOOGG, 2009: Section 8</p>	<p>Development of a trust fund that can be used to decommission the infrastructure when its production life is over should be considered.</p>

Environmental Monitoring

AOOGG, 2009: Section 4	The operator should carry out environmental monitoring to ensure that the basis for decisionmaking and the knowledge about the marine environment are sufficient to maintain acceptable environment conditions as a result of petroleum activities. Sufficient information should be obtained to see that all pollution and disturbance caused by the activities is detected, mapped, assessed and alerted so that necessary measures can be implemented.
AOOGG, 2009: Section 4	Environmental monitoring should measure physical, chemical, and biological conditions that may impact or be impacted by the activities being conducted.
AOOGG, 2009: Section 4	Before activities commence, environmental monitoring should begin with a comprehensive baseline investigation, which should incorporate existing information, and comprise as a minimum all monitoring sites and variables planned to be used in the long term monitoring program. The environmental monitoring program should continue through the decommissioning and reclamation phases.
AOOGG, 2009: Section 4	Environmental monitoring should be carried out regionally and be integrated so that interactions between multiple activities may be more easily detected.
AOOGG, 2009: Section 4	Environmental monitoring should preferably be conducted so as to distinguish impacts due to oil and gas activities from other relevant sources.
AOOGG, 2009: Section 4	Environmental monitoring programs should be reviewed on a regular basis to determine whether the results they are yielding indicate a need for changes in operational practices (for example, as a result of failing to achieve the initial hypotheses set out in the EIA or because of unforeseen impacts).
AOOGG, 2009: Section 4	Programs should also be reviewed to determine whether they should continue, be modified or terminated. Ultimately, the length and breadth of environmental monitoring programs will be determined by the scale and duration of offshore oil and gas activities and the immediate or longer-term impacts.
AOOGG, 2009: Section 4	Programs for identification and understanding of spatial and temporal distribution of biota particularly sensitive to pollution/discharges and emissions from petroleum activities should not only include adult stages and established communities (e.g. seabird feeding grounds, shoreline communities) but also early stages in the life cycle of plants and animals including larval stages, which may be more vulnerable to oil and chemicals than adult stages, if they are spatially or temporally relevant.
AOOGG, 2009: Section 4	The monitoring programs should not only be centered around field monitoring, but also include laboratory experiments and combinations of laboratory experiments and field studies whenever relevant.

<p>AOOGG, 2009: Section 4.3</p>	<p>Data from environmental monitoring should be harmonized in collaboration with AMAP and could be collected and stored in Arctic database repository, such as Circumpolar Biodiversity Network and GINA (Geographical Information Network Alaska), Arctic Ocean Observatory, and others, where it would be available freely to all national environmental protection and monitoring authorities and to other users.</p>
<p>AOOGG, 2009: Section 4.4</p>	<p>Results of environmental monitoring should also be utilized by regulators in compliance audits and on-site regulatory supervision as the basis for requiring any modification, postponement, or shut-down of operations or specific components of an operation and also as a basis of revising legislation when necessary. Authorities should use environmental audits to verify that the results of monitoring are used by the petroleum companies and reflected in their environmental strategy</p>

Compliance Monitoring

<p>AOOGG, 2009: Section 5.2</p>	<p>The regulatory supervision should cover all stages of design, fabrication, installation, operations and removal of offshore installations. It should address all relevant parts of the operating company's management systems, such as procedures for ensuring compliance with legislation, licenses, permits, and approved plans, as well as how the carrying out of activities are documented and reported.</p>
<p>AOOGG, 2009: Section 5.2</p>	<p>The regulatory supervision should also encompass the company's systems for pollution control and environmental monitoring, drilling and well operations techniques, production, and pipeline operations.</p>
<p>AOOGG, 2009: Section 5.2</p>	<p>Representatives of the regulatory agencies should have the legal base to take appropriate action in case of violations, noncompliance, or if the operator fails to react adequately to dangerous situations. These actions can include issuing warnings, injunctions, shutting down specific operation, a complete shut-down of the installation, withdrawal of environmental licence or permit, or initiating prosecution by the relevant authority.</p>
<p>AOOGG, 2009: Section 5.2</p>	<p>The regulatory agencies should establish plans for these supervisory activities. The extent and the issues to be covered should be based on the relevant regulatory requirements, the previous experience with the operators' compliance, environmental and geologic conditions, the type of activity carried out by the operator, the type of technology applied, reported accidents and incidents, and general knowledge regarding the operator and its ongoing activities.</p>
<p>AOOGG, 2009: Section 5.2</p>	<p>The plans for these supervisory activities should be available to the public.</p>

AOOGG, 2009: Section 5.2	Procedures should be maintained for compliance monitoring to: determine whether environmental management system elements and activities conform to requirements in the legislation, and are implemented effectively; examine line management systems and procedures, field operations, internal compliance monitoring practices, and data to see if they fulfill the company's environmental policy, objectives, and performance criteria; review incident reporting and remedy schemes in relation to incidents that have occurred; find out how identified current and potential environmental problems have been dealt with the operator and how this is reflected in the environmental management system; determine compliance with relevant legislative and regulative requirements; identify areas for improvement, leading to progressively better environmental performance; and formulate the conclusions in a report, which must be well documented.
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