

# CARBON CAPTURE AND STORAGE AND OCEAN FERTILIZATION: DEVELOPMENTS PURSUANT TO THE LONDON PROTOCOL

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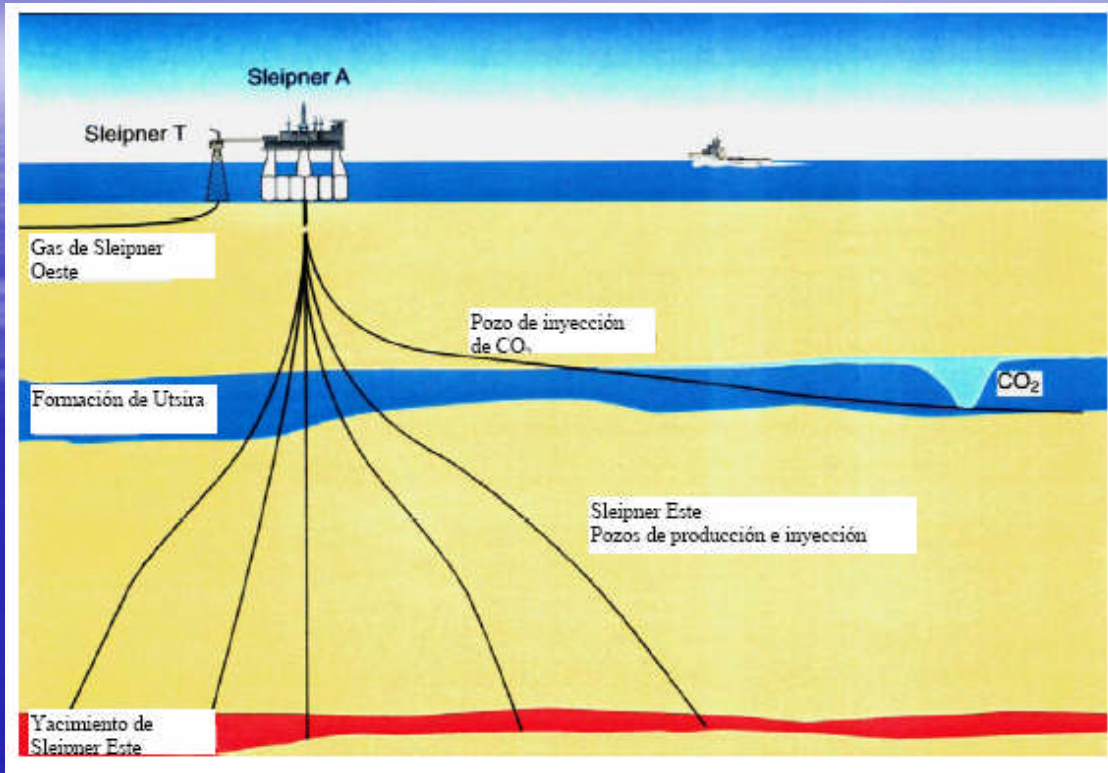
# Introduction

IMO's work on 2 fronts:

- Development of regulatory regime to reduce GHS emissions from ships (MARPOL)
- CO<sub>2</sub> sequestration in sub-seabed geological formations and ocean fertilization (London Protocol)

# WHY CO<sub>2</sub> SEQUESTRATION

- only one option in a range of measures to reduce atmospheric CO<sub>2</sub>
- aim: permanent isolation
- CO<sub>2</sub> streams generated on land/offshore installations
- transported by ships/pipeline



# CO<sub>2</sub> sequestration

## Sleipner Field (Norway)



*Sleipner West natural gas field where separated CO<sub>2</sub> is being injected into a deep salt-water reservoir (Courtesy of Statoil)*

# Why international action?

- oceans as global commons requiring regulation by international standards
- significant potential for storage in sub-seabed geological formations
  - safe
  - long-term

## CO<sub>2</sub> sequestration as a dumping activity

- LC Article 1(4) defines dumping as “any storage of wastes or other matter in the sea-bed or in the subsoil thereof from vessels, aircraft, platforms or other man-made structures at sea”.
- LC cf LP approach to dumping

## CO<sub>2</sub> sequestration as a dumping activity (cont)

- 2006 amendment to Annex 1, LP
  - to regulate CO<sub>2</sub> sequestration in sub-seabed geological formations
  
- EIF: 10 February 2007
  
- Effect: (1) adds new category of waste to the “reverse list”  
(2) creates legal basis for regulation of carbon capture and storage

## Risk assessment and Management Framework

- Risk Assessment and Management Framework for CO<sub>2</sub> sequestration in Sub-seabed Geological Structures completed in 2006
- Effect: CCS now subject to LP licensing arrangements
  - adoption of Guidelines to facilitate licensing process (2007)



# Reporting on CO<sub>2</sub> sequestration activities

- Objective of reporting
  - to inform future generations of the existence of the CO<sub>2</sub> reservoir and its history
  
- Reporting format approved in 2008:  
Information to be provided includes
  - chemical composition of CO<sub>2</sub> streams
  - cumulative storage since start of reservoir use
  - summary of monitoring results, leakage and mitigation measures

# Exports of CO<sub>2</sub>

- LP Article 6 prohibits “the export of wastes or other matter to other countries for dumping or incineration at sea”
  - Resolution LP.3(4) 2009 (not yet in force)
  - Effect: amends Art 6 to enable certain cross-border carbon capture and sequestration projects to proceed
  - Policy shift

# Ocean fertilization

- Aim – to draw down surplus atmospheric CO<sub>2</sub> into the oceans for sequestration purposes
- Scientific Working Group: Statement of Concern
  - knowledge about the effectiveness and potential environmental impacts of ocean iron fertilization currently is insufficient to justify large-scale operations and may have negative impacts on the marine environment and human health

# Ocean fertilization

- 2007 Contracting Parties endorsed Statement of Concern; but also agreed that:
  - this issue fell within LC and LP scope;
  - they should continue to study it with a view to its regulation; and
  - States should be cautious when considering proposals

# Ocean fertilization

- Non-binding Resolution (LC-LP.1(2008))  
whereby they agreed:
  - given the present state of knowledge, ocean fertilization activities other than legitimate scientific research should not be allowed
  - such activities contrary to the aims of LC and LP

# Ocean fertilization

- 2009/2010 works in progress:
  - 8 options for regulating ocean fertilization
  - assessment framework on ocean fertilization