

Use of Multi-Purpose Offshore Hubs in the Arctic

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Presenter

Aleksandar-Saša Milaković, MSc Nav Arch

What are multi-purpose offshore hubs?

A multi-purpose offshore hub is an offshore floating or anchored unit whose purpose is to provide support to various marine operations in the area ensuring support functions such as:

- SAR operations/coordination
- Hospitals/medical facilities
- Oil spill recovery equipment
- Weather surveillance
- Communications
- Helicopter base
- Power production
- Cargo storage
- Research station, etc.

Types of multi-purpose offshore hubs used in the Arctic

Nuclear icebreakers:

- Ones in operation providing infrastructural support
- Ones taken out of commission to be converted to security posts or research stations in the Arctic



Ref. Rosatomflot

Types of multi-purpose offshore hubs used in the Arctic

Floating nuclear power station e.g. Akademik Lomonosov:

L = 144 m

B = 30 m

Displ = 21500 t

Crew = 69 pers

$P_{\text{OUTP}} = 70 \text{ MW}$

Laid down: April 2007

Launched: June 2010

To be put in commission: 2019 in Kamchatka region



Ref. www.wikipedia.com



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Types of multi-purpose offshore hubs used in the Arctic

Floating Storage and Offloading (FSO) Umba:

L = 333 m

B = 60 m

D = 8.2 m

DWT = 301071 t

Location: Kola Bay



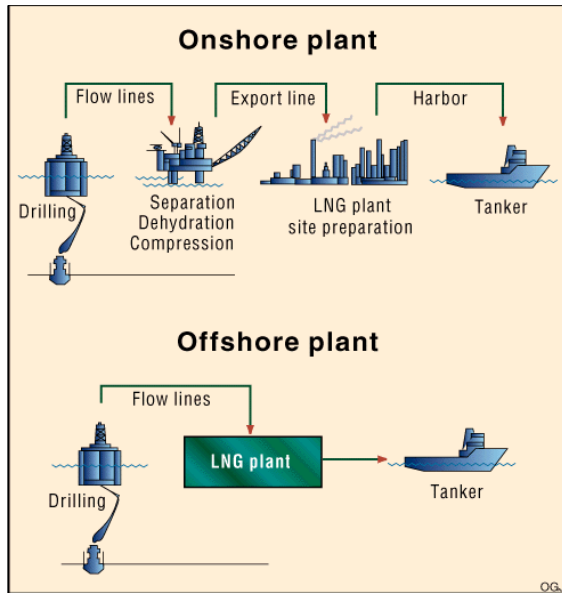
Ref. www.vesselfinder.com



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Types of multi-purpose offshore hubs used in the Arctic

Floating Liquefied Natural Gas (FLNG) unit has been considered to be used for Yamal project, in order to reduce the need for dredging of the channel for vessel access.



Ref. www.ogj.com



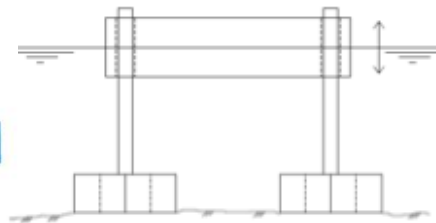
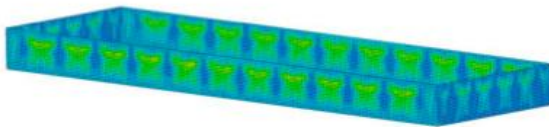
Ref. www.oilgaspost.com

Types of multi-purpose offshore hubs used in the Arctic

Floating Quay for the High Arctic (FQHA)

(developed by Tschudi, Longyearbyen Lokalstyre and Dr.techn.Olav Olsen AS)

- Current construction technologies are expensive, leaving irrevocable environmental footprints
- Offshore concrete structure is durable and safe construction solution, providing flexibility and mobility
- Concrete shell reinforced in both longitudinal and transversal directions able to resist characteristic Arctic loads
- Moored by chains or GBS
- Connected to shore by bridge





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Types of multi-purpose offshore hubs used in the Arctic

Floating Quay for the High Arctic (FQHA)

(developed by Tschudi, Longyearbyen Lokalstyre and Dr.techn.Olav Olsen AS)



FQHA-50
50 x 20 x 6 m

UTILITIES
Electricity and Clean water



FQHA-80
80 x 25 x 7 m

MINING INDUSTRY
Load-off and Living Quarters



FQHA-80
80 x 25 x 7 m

FISHING INDUSTRY
Floating fish processing plant



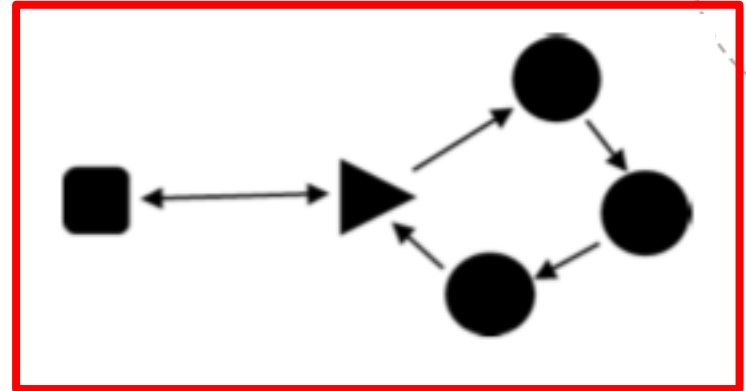
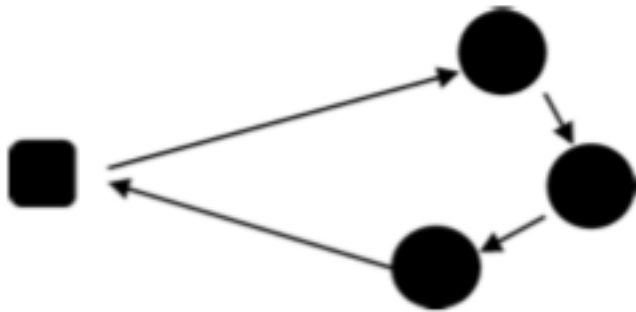
FQHA-120
120 x 35 x 9 m

TOURISM AND RESEARCH
Tourist portal and research facility

Multi-purpose offshore hubs supporting different activities in the Arctic

1. Supporting offshore oil & gas operations in the remote Arctic areas (some research done on the topic - e.g. INTSOK, 2013; Akselsen, 2014; Milaković et al., 2015; etc.)
2. Supporting trans-arctic shipping activities (little or no research done on the topic)
3. Supporting destination shipping activities (little or no research done on the topic)
4. Supporting multiple activities - most likely solution for the future (little or no research done on the topic)

Supporting offshore oil and gas operations



Floating offshore base, hub



Onshore supply base



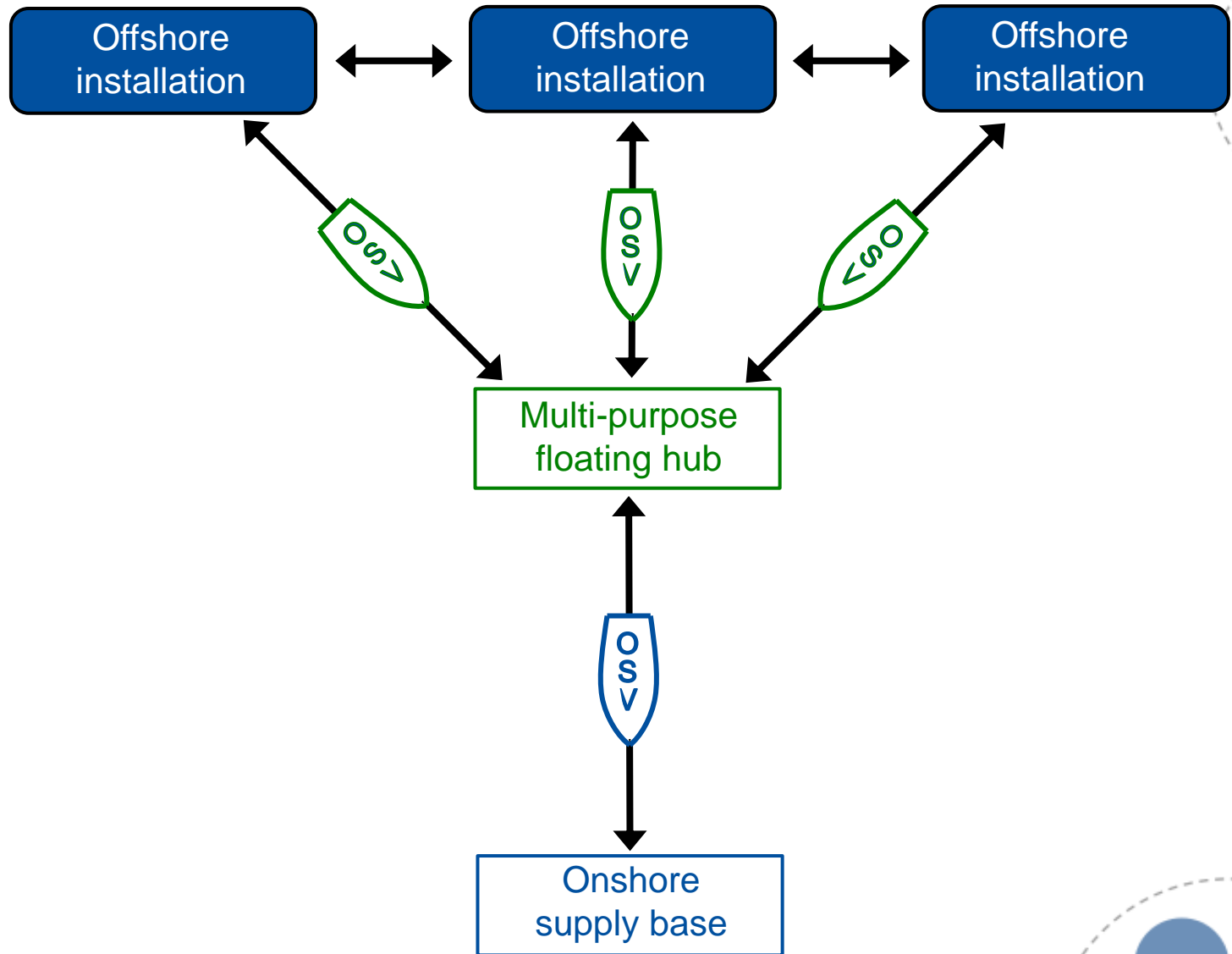
Offshore installation



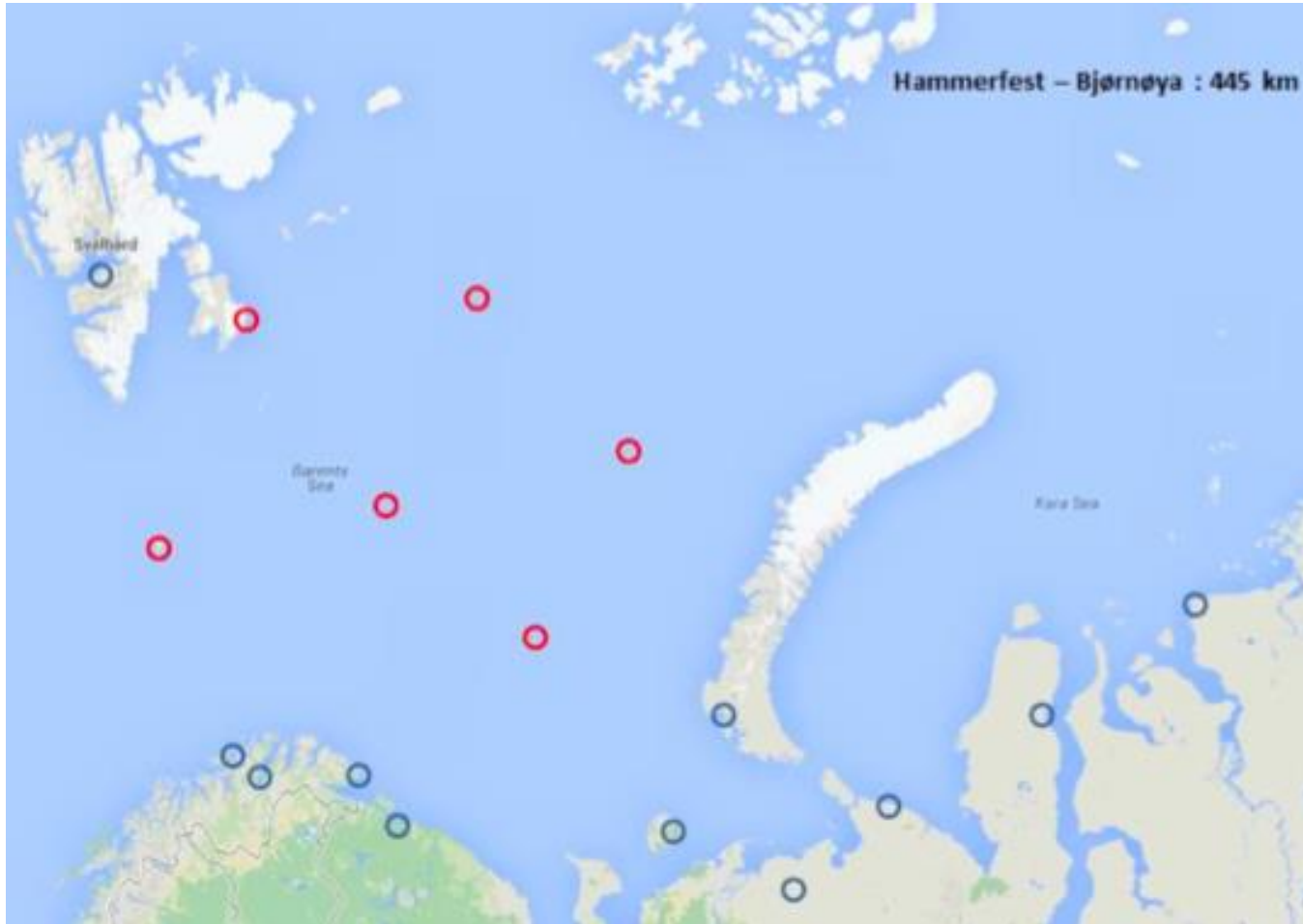
Proposed route

Ref. Akselsen, 2014

Supporting offshore oil and gas operations

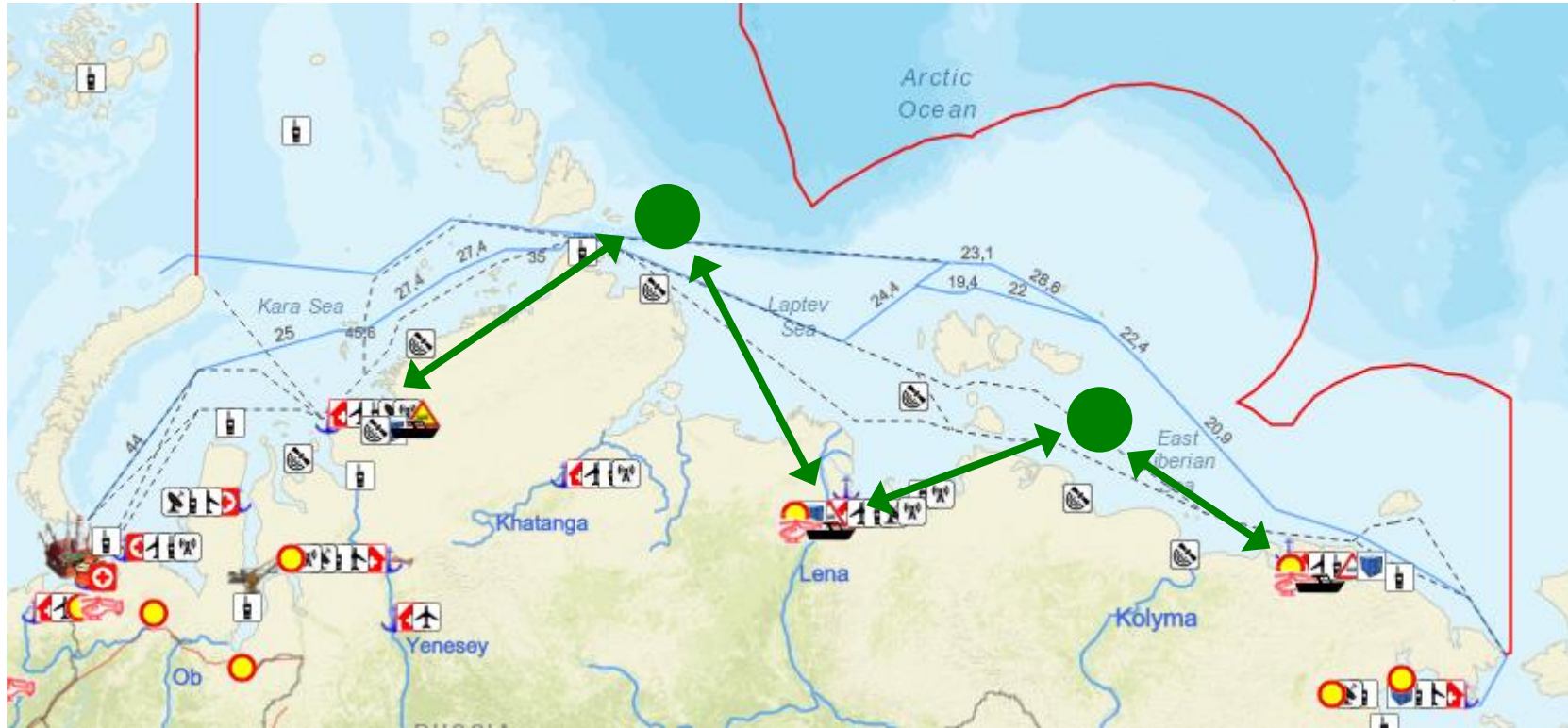


Possible locations of multi-purpose offshore hubs in the Barents Sea based on SAR helicopter range



Ref. INTSOK, 2013

Possible locations of multi-purpose floating hubs to support trans-arctic and destination shipping



Ref. www.chnl-nsr.maps.arcgis.com