

Application for Vessel Temporary Admission to the Coasting Trade of Canada

1.0 DETAILS OF APPLICATION

Applicant

Mathers Logistics, 79 Mews Place, St. John's, Newfoundland Canada A1B 4N2 on behalf of Petroleum Geo-Services (PGS).

Vessel Particulars

Name / Registry	M/V Thor Magni / Bahamas
Category and Type	Seismic support vessel
Call Sign	C6BH9
IMO #:	9679024
Characteristics:	
 Gross Tonnage 	2084 MT
 Deadweight 	1750 MT
 Draught 	5.70 m (max)
Length	64.40 m
Class	DnV * 1A1, EO, SF, SPS, Clean design, Naut- AW, Ice 1A, RP, BWM-T, TMON, Recyclable

Proposed Activity

The ship will be used to support the operations of seismic research ships, similar to the the Ramform Atlas (the "**Ramform Vessel(s)**") by facilitating crew changes and resupplying of fuel, supplies and equipment, off the east coast of Newfoundland and Labrador. See further details below.

Period of Time for Which Permission is Required:

Starting date:	May 1, 2022
Completion date:	November 01, 2022
Permission required by:	January 27, 2022

2.0 SCOPE OF WORK

Geographical Location:

PGS will have both Ramform Vessels performing 3D seismic surveys covering a total of 12,000 sq. km. approximately 200nm off the east coast of Newfoundland.

Details of Operation

Offshore seismic surveys are acquired by recording sound waves generated from an acoustic

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Tel: (902) 429-5680 Fax: (902) 429-3350 source towed by the seismic vessel which are reflected back from the subsurface and detected in listening devices in a cable or cables called "streamers" which are towed by that same vessel. The Ramform Atlas will deploy 16 streamers, each 8 km long, 100m apart and is expected to complete the survey within a period of 4 months. The Ramform Vessels must remain offshore and in operation for the duration of the project.

In order to remain offshore and in operation for the duration of the project, the Ramform Vessels require a suitable support vessel (the "**Support Vessel**") which will carry out crew changes and resupply of fuel, supplies and equipment to the Ramform Vessels. In particular the Support Vessel must be able to perform the following services amongst others:

- Safely lift and recover a purpose built 32ft workboat (the "**Workboat**") deployed on each Ramform Vessel via minimum 15 ton safe working load davit suitable for the Workboat. The Workboats are integral to the operation of the Ramform Vessel and cannot be modified. The Workboats are used to maintain the deployed seismic equipment, transfer cargo and personnel to/from the Support Vessel.
- Safely perform a full crew change 200 nm offshore every 42-56 days while making way at 4 to 5 knots (minimum 48 crew for each crew change). Crew and supplies are to be transferred between the Ramform Vessel and the Support Vessel by a davit launched Workboat. Helicopters will not be utilized for crew changes.
- Inline refueling of the Ramform Vessel while maintaining 4 to 5 knots headway 1104cbm fuel per load.
- SAR capabilities as set out in C-NLOPB authorization. PGS obtains C-NLOPB authorization based on PGS Safety Management System. This implies support vessels with defined minimum specification must be used, including a Dacon scoop.
- Ice class, DNV-GL 1A construction as required by the client.
- Water jet propulsion forward as required by the client. This means the Support Vessel must be able to operate without using the main propellers in an emergency area (less hazard to any survivors floating at sea). This is especially important when operating close to the seismic cables and assisting the Workboat in their cable works (about 8 km behind the Ramform Vessel).

Period

Due to the extreme weather conditions in the North Atlantic waters, offshore 3D seismic operations can only be conducted during the summer months. The Ramform Vessels are planned to arrive in Canada 1st May 2022 and will remain offshore, in operation and with their seismic array deployed, until the survey is completed around November 1, 2022.

Regulator

The Canada-Newfoundland & Labrador Offshore Petroleum Board (C-NLOPB) is the regulator for this area and responsible for issuing the Geophysical Authorization which allows an Operator to conduct an offshore seismic survey. Safe operations are the overriding factor for a Geophysical Authorization to be issued by the C-NLOPB.

3.0 EXPRESSION OF INTEREST AND COMMUNICATION WITH POTENTIAL CANADIAN PROVIDERS

PGS reviewed three potential Canadian suppliers but none of the proposed vessels met the minimum requirements and are deemed not suitable for the scope of work due to the following

conditions:

- No davit capable of lifting the unique Ramform Workboat (as described below) for crew transfer (minimum 15 ton davit).
- Insufficient crew carrying capabilities.
- No inline refueling capabilities.

4.0 SPECIAL OPERATIONAL CONSIDERATIONS

Refer to Attachment 1 in this document for the Ramform Atlas vessel specification.

PGS has developed a comprehensive set of procedures in regards to utilizing Support Vessels during Seismic Surveys. PGS has defined procedures concerning any vessel movements ahead of the towed array due to increased risk to all vessels. PGS utilizes special purpose support vessels (Thor Magni) that are designed and built to handle multiple different duties in support of the seismic operation.

In order to be deemed suitable, the Support Vessel meet the special requirements of the Ramform Vessels and must be able to carry out all of its duties under the following special operational conditions:

- The Support Vessel cannot operate behind the Ramform Vessels. Furthermore, alongside operations or mooring of a Support Vessel is also not possible for crew change, bunkering or loading of cargo.
- When the seismic array is deployed (throughout the entirety of the project), the Ramform Vessels **must** maintain forward propulsion at a minimum of approx. 4-5 knots at any time to keep control of the array.

In addition to the above general special operational considerations the Support Vessel must be able to meet the following:

Special Operational Requirements for Crew Change

- The C-NLOPB has previously approved crew transfers utilizing the Davit Launched Workboat. PGS is unaware of any other approved method of crew transfer to/from the Ramform Vessels.
- The Ramform Vessels carry a maximum of 60 crew including "Special Personnel" (ie industrial personnel or non-marine personnel). In addition, Ramform Vessels carry approximately 8 third party and client representatives. Accordingly, the Support Vessel must be capable of accommodating a minimum 48 passengers.
- Each Ramform Vessel requires a full crew/personnel change (minimum 48 crew for each crew/personnel change) every 42-56 days while making way at 4 to 5 knots. In addition, PGS is required by the Seismic and Maritime crew union to carry out crew changes within +/-2 days of the planned crew change date.

Special Operational Requirements for recovery of Workboat

• Given the size and weight of the Workboats, the Support Vessel requires a davit with a minimum safe working load (SWL) of 15 tons and a safe platform on board for crew transfer.

Special Operational Requirements for Re-fueling

- Each Ramform Vessel requires inline fueling operations while towing its seismic array at 4 5 knots. The Support Vessel **must** be able to maintain fuel transfer pressure and heading control during inline fueling at 4 5 knots. This is a critical success factor as the towed array of each Ramform Vessel is 1400-1600m wide and the escape route in case of technical problems involves getting completely clear of the towed array.
- Due to their consumption, the Ramform Vessels require frequent fuel top up's by the Support Vessel. A typical Support Vessel Full Fuel load (1104 cbm) covers approx. 2-3 weeks consumption.
- The Support Vessel's fuel rig must include:
 - TODO couplings both ends (TODO couplings are installed on each Ramform Vessel).
 - Dry break coupling (no fuel in the water when opened).
 - Towing hook set up for distance line with quick release system from bridge.
 - Flowmeter.
 - Multiple pumps to maintain transfer rate of no less than 150 180 m3/ pr. hour.
 - 200m fuel hose, type 5" hard-wall rig supply in sections of 40m.

5.0 SPECIAL CHARACTERISTICS OF THOR MAGNI

Please see Attachment 2 in this document for the vessel specifications of the Thor Magni. Thor Magni is a specially designed and built support vessel for the Ramform Vessels and the specifications required by PGS.

Thor Magni is Canadian duty paid.

Following are some of the key characteristics of the Thor Magni, which are critical for the support of the 3D seismic operation and which would be required for any Support Vessel to be deemed suitable for this project:

Crew Carrying Capabilities

Thor Magni has 60 bunks: 8 single cabins for crew plus 52 beds for passengers, including grab bags for all Special Purpose Ship (SPS) crew. Thor Magni maintains a Special Purpose Ship Safety Certificate.

Thor Magni can complete a crew change in one run transferring the full complement within one day (daylight hours) and within 4-5 days from the time on-signers depart St John's until the off-signers arrive in St John's.

In addition, the Thor Magni has a large purpose built anti-rolling tank behind the bridge, which in the high ice class gives the vessel a very stable platform (minimum rolling), when doing Workboat operations with seismic crew offshore. This is crucial to the safety of the Workboat and it's seismic crew. An unstable vessel (as many PSV's are), will be a risk factor.

Fifteen (15) ton Davit capable of hoisting the Workboat

Thor Magni is equipped with VESTDAVIT - MOB PLR7000- PLR 15000. The PLR-15000 davit has a SWL of 15T and this is the biggest one-point lifting davit supplied by Vestdavit specially designed to lift the Ramform Vessels' Workboat. This davit allows safe lifting of the Workboat and transfer of crew between the Workboat and Thor Magni during crew changes.



Figure 1: PLR-1500 davit

Refueling capabilities

Thor Magni has capability to carry 1104cbm fuel in her transportation tanks and transfer the full load of fuel to the Ramform Vessels in 8 hours. Thor Magni is fully equipped to perform inline refueling operations whilst the Ramform Vessels' seismic gear is deployed and meets the minimum fuel rig criteria indicated in section 4 above.

Thor Magni is designed to do close up inline fueling operations whilst stationed approx. 150 meters ahead of the Ramform Vessel.

Thor Magni is equipped with multiple diesel electric propulsion including a forward Schottel (water jet) for maintaining heading control during inline fueling at 4 knots. It should be noted that this is a critical success factor as the spread of the Ramform Vessels is 1400-1600m wide and the escape route in case of technical problem involves getting completely clear of the towed spread.

In addition, Thor Magni's crew have specialized vessel simulator training with Ramform bridge officers and support vessel bridge officers for inline fueling at speeds of 4 to 5 knots. Including emergency towing of seismic vessel with deployed gear. Any Support Vessel crew would be required to obtain such training.

SAR capabilities

PGS obtains C-NLOPB authorization based on PGS Safety Management System. This implies support vessels with a defined minimum specification must be used. Thor Magni fulfills all these including the SAR capabilities required by the CNLOPB.

Thor Magni is equipped for multiple recovery of man overboard situations. Vessel is equipped with specially designed Dacon scoop and a fast rescue boat, Alusafe 770 MK II twin jet. She also has installed a FLIR night and thermal imaging camera for SAR.

The Dacon scoop will avoid putting the Support Vessel's at risk during recovery of man overboard / multiple man overboard situations. The system requires Crane, specially designed Dacon scoop fitted for the vessel and regular training. This is an important mitigation when performing personnel transfer using the Workboat between Ramform Vessel and Thor Magni

Thor Magni also has water jet propulsion system as required by the client.

Other noteworthy points:

In addition to the foregoing, the Thor Magni is equipped with the following:

- 12 Ton SWL crane for general port cargo operations and possibilities to recover lost/drifting seismic gear if needed.
- Kongsberg Seatex MBR 179 radio. This streams live feeds from the Ramform Vessel to the Thor Magni or vice-versa with main purpose being:
 - Display on Thor Magni of Ramform Vessel's heading, speed and offset values to reduce amount of communication between vessels and reduce risk in operation.
 - SAR Flir thermal imaging camera transfer to Ramform Vessel
 - Ramform Vessel's In-sea equipment positions/overview display on Thor Magni (ORCA DATA)
- Diesel electric propulsion system with high redundancy, removing the danger of total blackout.
- 50 tons towing hook for emergency towing with quick release system from bridge
- Seahawk Radar ice navigator.

6.0 ADDITIONAL DETAILS OF APPLICATION

- 1. Customs Office of Importation: St. John's, NL
- 2. Customs Office of Accounting: St. John's, NL
- 3. Period of Time for Which Permission is Required:

Starting date:	May 1, 2022
Completion date:	November 01, 2022
Permission required by:	January 27, 2022

4. Background Information:

This application is made under provisions of the *Coasting Trade Act*, *Oceans Act* and the *Customs and Excise Offshore Application Act*.

5. Details of the Applicant / Client

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<u>Cynthia Lohnes</u>
709-745-8700
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Name of Client: Petroleum Geo-Services (PGS)

6. Signature of applicant's authorized representative:

Signature

20-December-2021

Date

Attachment 1: Vessel Specification - Ramform Atlas



Maritime Specification

Summary	
IMO number	9629897
Owner	PGS Titans AS
Maritime operator	PGS Geophysical AS
Flag	Bahamas
Port of registry	Nassau
Call sign	C6AX2
Builder	MHI, Nagasaki
Built	2014
Classification society and notations to class	DNV +1A1, SPS, ICE C, E0, HELDK, RP, CLEAN DESIGN,TMON, BIS, NAUT-OSV, VIBR, COMF-V(CRN) 3

Vessel Dimensions	
Length	104.2 m
Breadth	70 m
Draft	6.4 m

Vessel Tonnage	
Gross (IMO-69)	20637 tons
Net	Approx 8100 tons

Vessel Capacities	
Fuel	4800 m ³ HFO + 600 m ³ MGO
Maximum endurance (shooting/transit)	95
Vessel Cruising Speed Knots	16 knots
Vessel Speed Knots	5 knots in production, 16 knots on transit
Maximum Transit Speed Knots	16 knots
Power Plant	6 X 3820 Kw. Wartsila W8L32 / ABB AMG 0900SM 10 LS
UREA System for reducing NOx Emissions from Engine Exhaust Gas	H&H UREA System. NOx Guaranteed Emission MAX 1.5 g/KWh
Propulsion type	Diesel electric, Triple CP propeller plant with nozzle and propeller shaft. (3 X 6000 Kw ABB AMZ 120WV12 LSF Direct drive)
Pumps	Allweiler
Fresh water maker capacity	2 X 30 m3/Day Alfa laval Aqua 100 HW
Accommodation	80 (60 single and 10 double cabins)
Helideck	14,6 t Super Puma/EH-101) "D" 23 mtr

Communications Systems	
Inmarsat B	00 870 773 167 702 (Bridge) / 00 881 623 457 781 (Iridium)
Direct Phones	+47 6752 6451 (Bridge)
Norsat	+47 67 52 6451 Bridge

Navigational Aids	
Radar	Arpa Radar MFD one X-Band and one S-Band, in addition one SeaHawk (SHN X9)
Auto pilot	K Thrust
Heading sensor	3 x Sperry Marine Navigat X MK1 Kongsberg Seapath 330/ Model 929060
Echosounder	EA 600, Skipper, one forward and two aft
Water speed log	Skipper - Electromagnetic speed log

Vessel Fire Fighting Equipment

Fire detection system

Consilium Nittan, Salwico Monitor.

Pumps	Allweiler, 3 X 250m3/hr + 1 X 75m3/hr
Portable Fire Extinguishers	Portable Fire Extinguishers
Hydrants and hoses	2" Storz
Inert gas and other fixed systems	Water fog (HIFOG), Argonite, foam
Foam deluge system	Danfoss Semco,

Vessel Safety and Survival	
Fireman's outfits	6 x Draeger fireman outfits
Breathing apparatus	6 spare composite bottles Additionally 21 EEBD's situated around the vessel spares
Life boats	$2\ {\rm X}$ Fassmer. 40 pax each. 6 persons as Rescue Boat and 20 persons as tender.
Life rafts	BRUDE MES SPS system, raft 65+15 persons each side
MOB raft	NA
Life jackets	164 x lifejackets, adult size8 x lifejacket, children size
Survival suits	88 x immersion suits, 16 x working suits for FRC
Life buoys	12 with lanyard, 3 with lanyard and light

Attachment 2: Vessel Specifications - Thor Magni M/V Thor Magni











Thor Magni, purpose built support/escort ship, built in 2015 in Besiktas Shipyard, Turkey. Classed: DNV-GL

SPECIFICATIONS

Name:

M/V Thor Magni

Call sign: C6DN2

Home port: Nassau

Flag: Bahamas

MMSI:

311000723

IMO no: 967 9024

Class:

DNVGL*1A1, EO, SF, SPS, CLEAN DESIGN, NAUT-AW, ICE-1A, RP, BWM-T, TMON, RECYCLABLE

Built:

2015 Besiktas Shipyard

GT:

2089

NT:

627

LOA: 64.40 m

LBP-

57.60 m

Beam:

14.50 m

Breadth moulded: 14.50 m

Depth moulded:

7.20 m

Cargo ondeck:

- · Deck cargo: 5 T/M2
- Deck area:: 25.8 x 12.1 m, Ca. 300 m2 Cargo Space

Bollard pull: 50 TONNES

Accommodation:

- Crew: 8 x 1 man
- · Extra berths: 2 x 2 men, + 48 berths
- · Extra people allowed on board: 52 (Total 60 persons incl, crew)

Deckequipment:

- Deck crane: A-LIFTING 12T SWL 2.3-10M 10T SWL 2.3-17M
- · Rope winch: DMT 200M /6 LAYER 10 KN
- Capstan: DMT 50 KN (3 PIECES)
- · Anchor winches: DMT 61.5 KN 101-H36K3 (2 PIECES)
- Towing hook: MAMPAEY 50/65 T
- · Davits: 2 x VESTDAVIT MOB PLR7000 & PLR 15000
- Gypsies: Ø36
- Bow anchors: YAPAS 2850KG SPEK TYPE ANCHOR
- Chains: 27.5 x 8 m, same length both sides
- Re-fueling unit: MB Hydraulikk with Fuel and Lube drums

Sewage Treatment plant:

JETS VACUUM - ECOMOTIVE for 60 persons

Rescue boat: MARITIME PARTNER - ALUSAFE 770 MK II TWIN

Additional Rescue Equipment: Dacon Rescue Scoop model RSA700, 7 x 10m

SafetyEquipment:

- Liferafts: VIKING MODELDK 7x25 PERSON, 1x16 PERSON
- Life-jackets: VIKING SOLAS RIGID LIFE JACKET 60 ADULT, 2 CHILD
- Immersion suits: Viking PS 5002 64 suits

Depth boat deck: 9.90 m

Depth main deck: 7.20 m

Draft: 5.70 m max

Main engine: 4 x 1000 kW Yanmar, 6EY22ALW

AUX.engine: 260 kW, Scania DI12 62 M

Generators: 4 x 1250 KVA Hyundai 1250. AC 960 V, 1045.6 Amp, 60 HZ

Speed:

- Max: 19.56 m3/ 24h @13.7 knots
- Economy: 9.6 m3/24h @ 10.8 knots
- Chase: 3.5 m3/ 24h @ 4.5 knots

Propellers: BERG PROPULSION BCP760 F (2 PIECES)

Rudder: ROLLS ROYCE FM (2 PIECES)

Steering gear: ROLLS ROYCE SR622 FCP (2 PIECES)

Thruster: SCHOTTEL PUMP JET TYP SPJ 132 RD-L

Water generator: ENWAMT 20 TSRH

Bunkers:

- HeavyFuel 1104Cbm, Diesel 437Cbm
- Lubes: 19 Cbm
- Fresh water: 75 Cbm

FRC safety equipment:

- FRC working suits: Viking PS 4170 4 suits
- Inflatablelifejackets: VikingPV93209Lifejackets

Firefighting equipment: Other: Water Mist Fire Suppression System

Radio and navigation equipment:

- GMDSS equipment: FURUNO, RC 1800T
- Radar: FURUNO, FCR 2119-BB SeaHawk
- Echosounder and speed-log: FURUNO, FE-700
- Gyro / autopilot: ANSCHUTZ, 108-010 (2PIECES)
- Bridge alarm: ULSTEIN
- Acoustic Doppler Current Profiler: NORTEK

Pumps:

- Fuel OI: 2x ALLW EILLER, IEC 250M-2, 189M3/H 5 BAR (Heating capacity max 60 deg.C) (2 FOR HFO + 1 FOR MDO)
- Urea: ALLWEILLER, TRILUB 140 r 46 w 115 (5.5 kW)
- Seawater ballast pum p: ALLW EILLER, NB65-160IEC132M,80M3/H 2.5 BAR

Oily water separator:

DVZ 500 FSU ailchief.

Attachment 3: General Arrangements - Ramform Atlas





Attachment 4: General Arrangement - Thor Magni