

## Rose-Anne Hawkeswood

---

**Sent:** Tuesday, 26 February 2019 9:54 AM

**Subject:** Scenarios for marine diesel

Hi Steve/ Rose-Anne,

As promised, pls find outlined below a few scenarios where MDO might need to be utilised instead of LNG.

Essentially the common theme is that it is an alternative fuel for emergency situations where unscheduled movements, emergency breakdown maintenance and/or low LNG supplies remain on board and the priority must be to keep the tanks cold to ensure an ability to receive the next shipment.

### BACKGROUND

The FSRU is equipped with 4 x Wartsila engines (W8L50DF). In normal operating mode (regasification mode) the FSRU engines will be fuelled by the LNG on-board.

The engines are however designed to have dual fuel capabilities, meaning they can also run on marine diesel oil (MDO) if there is no LNG available for the engine.

Situations where MDO mode would be required would be highly unusual / emergency type situations such as extended idle periods combined with no /low LNG supply on-board or an engine breakdown.

The intent of the unit is to ensure there is always gas on-board to keep the ship cool to receive new deliveries and to deliver gas supplies into the pipeline. LNG carrier deliveries are currently anticipated every 2 – 3 weeks.

As an example of the unlikelihood of the above scenarios, a similar FSRU, the Independence, in Lithuania has not refilled its on-board emergency MDP supplies since it started operating in 2014.

It should also be noted that a maximum of two engines are needed during normal operations. This provides some additional redundancy, in that should there be a maintenance problem with one engine, there are at least 2 other engines which could be utilised while maintenance works occur, thus avoiding the need for MDO.

However, some situations where MDO might be needed include the unlikely scenarios of:

- Harbourmaster instructing the FSRU to move to sea or holding a delivery vessel out at sea during a coastal hazard or some other in-port incident/event (eg. a fire on another vessel or port operation etc). If LNG supplies on-board are low, MDO would be used to run the engines to get out to sea – just like any other vessel in port. (Regasification would obviously not be occurring)
- Low LNG supplies and the vessel still need to operate as a marine vessel – again same as other vessels in the port with crews . This is known as “hotel load”, which is designed to continue power to accommodation areas and/or deck lighting for safety and comfort of the on-board crew.
- Something goes wrong with a critical part needed for the burning of gas to power the ship engines and a replacement part is needed. In that instance LNG can't be used to power the ship, regardless of level of LNG supplies and so the ship must run on MDO while a replacement part is sourced and installed. However again pls note the ship as 4 engines and with a max of 2 ever needed when moored, there is in-built redundancy.
- One of the 4 tanks is faulty and must be repaired, which means it needs to be emptied, decommissioned and re-commissioned while moored. This typically requires the use of specialist equipment designed for dealing with inert gases in enclosed spaces and is apparently powered by MDO.

In MDO mode, as with other vessels in the harbour, the engine output would exceed NSW POEO (2010) NOx limits at emission source, although the ground level criteria at nearby sensitive receptors will be achieved.

In addition, while an event is unlikely due to in-built redundancies and flexible scheduling, if they do occur the events will be of short duration pending delivery of LNG supplies, which if required can include spot cargoes diverted to us (1 – 2 weeks if in region) vs the regular scheduled deliveries (every 2 – 3 weeks).

Kylie Hargreaves  
Government & Stakeholder Relations