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20m & 30m Fishing Boat Concepts

aluminumnow
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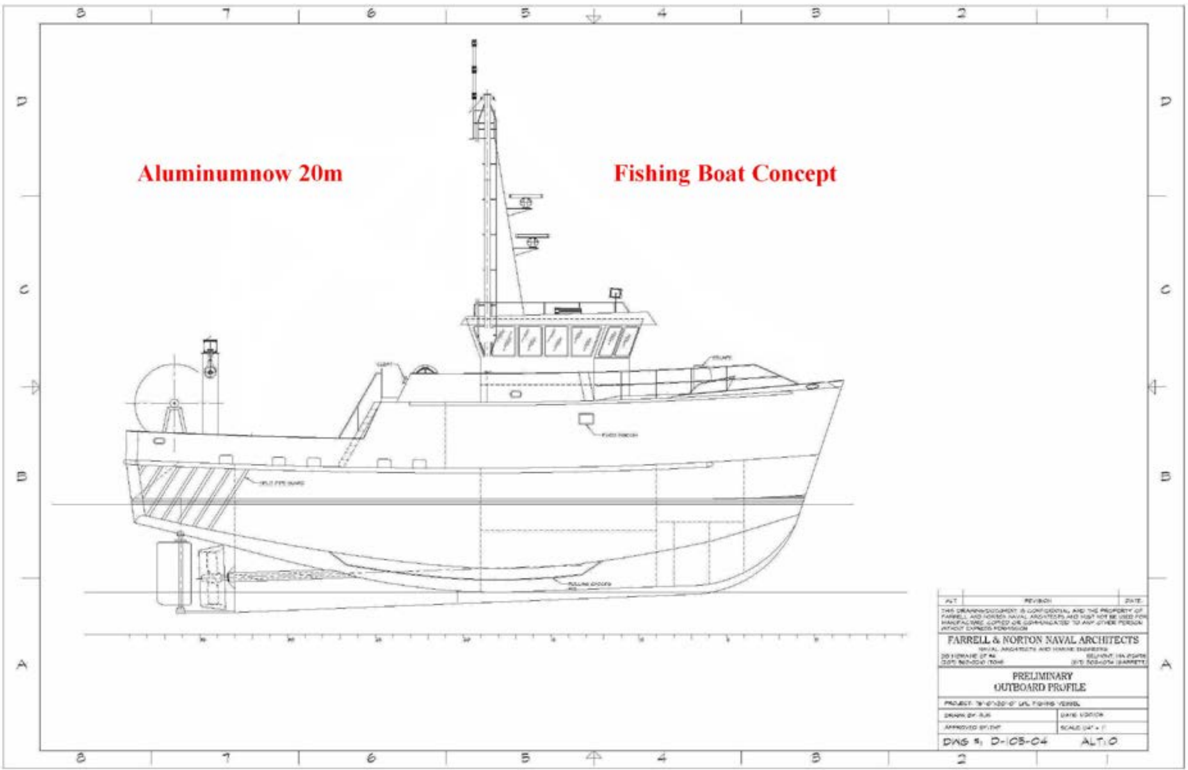
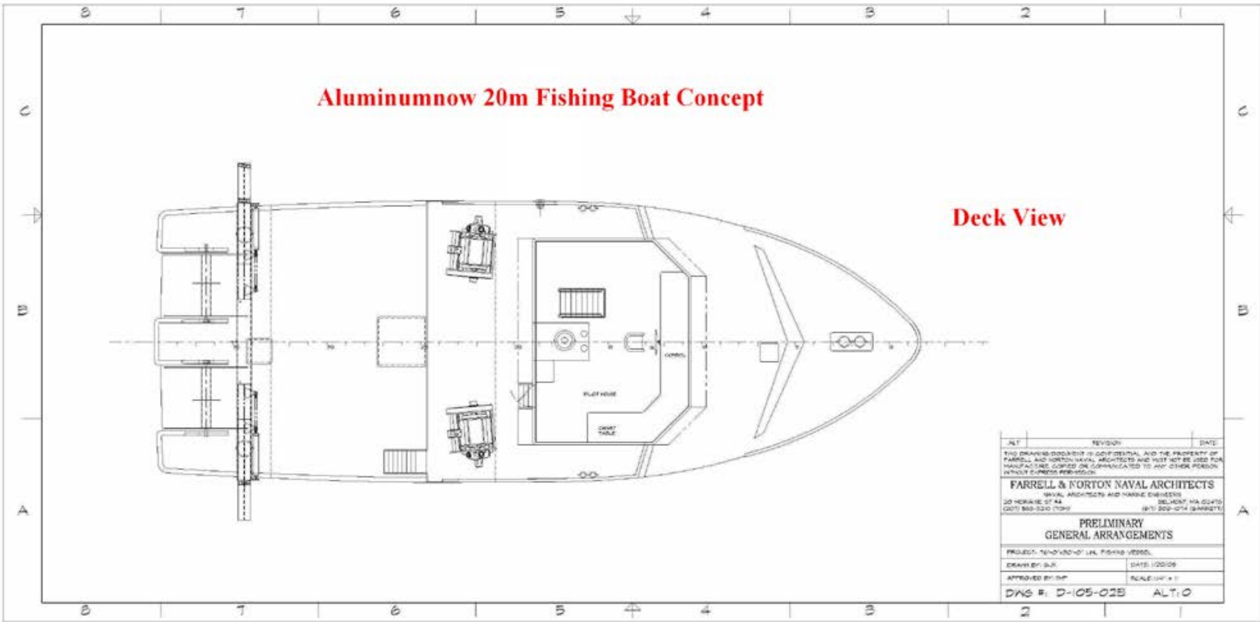
Maritime Solutions


Aluminumnow 20m
Fishing Boat Concept
FARRELL & NORTON NAVAL ARCHITECTS
PRELIMINARY
OUTBOARD PROFILE


Aluminumnow 20m Fishing Boat Concept
Deck View
FARRELL & NORTON NAVAL ARCHITECTS
PRELIMINARY
GENERAL ARRANGEMENTS
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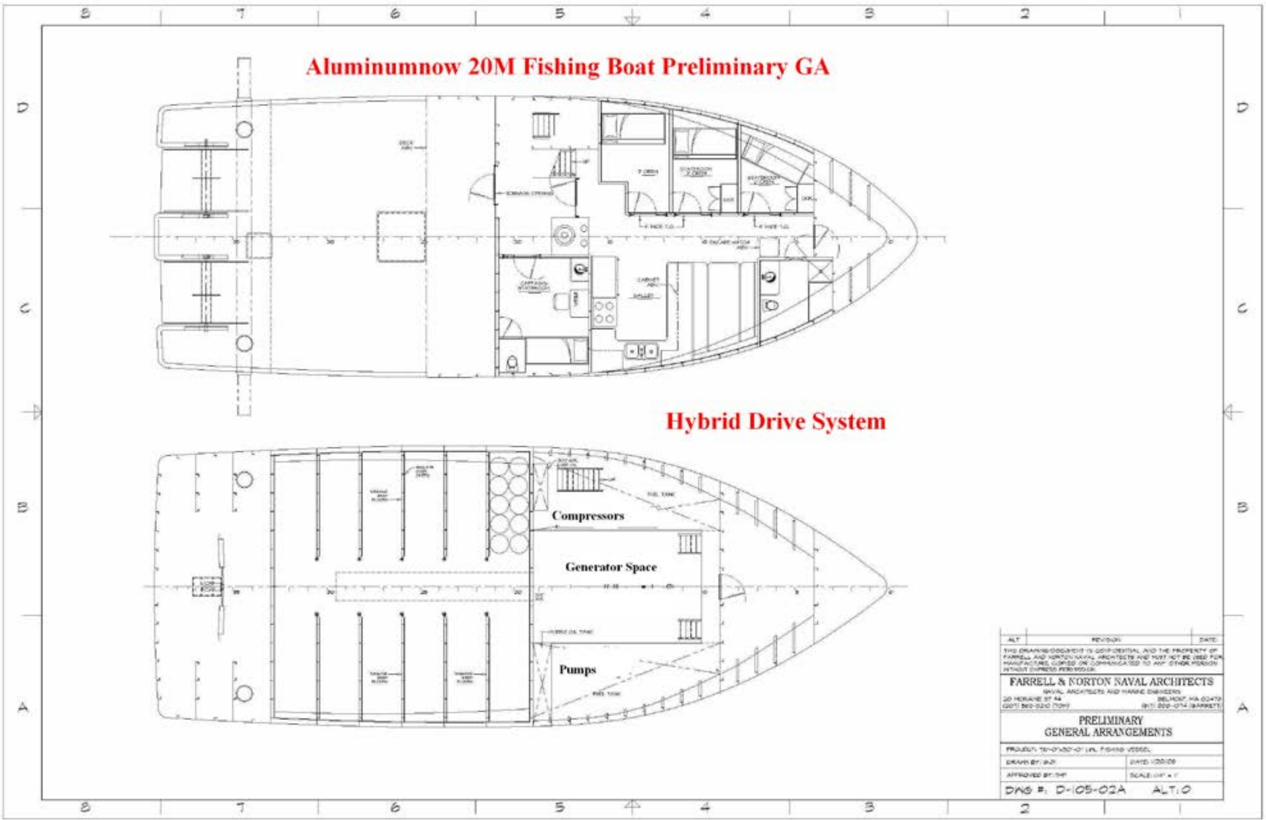
Aluminumnow 20M Fishing Boat Preliminary GA
Hybrid Drive System
Compressors
Generator Space
Pumps
FARRELL & NORTON NAVAL ARCHITECTS
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GENERAL ARRANGEMENTS
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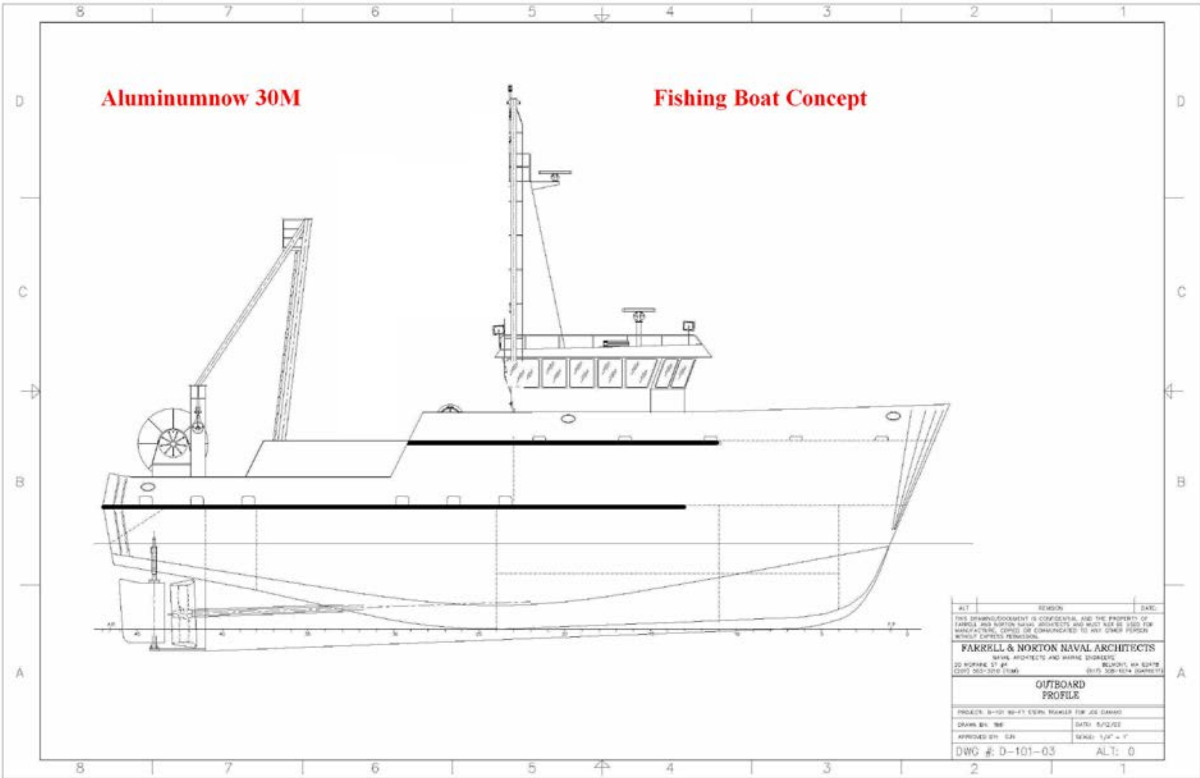

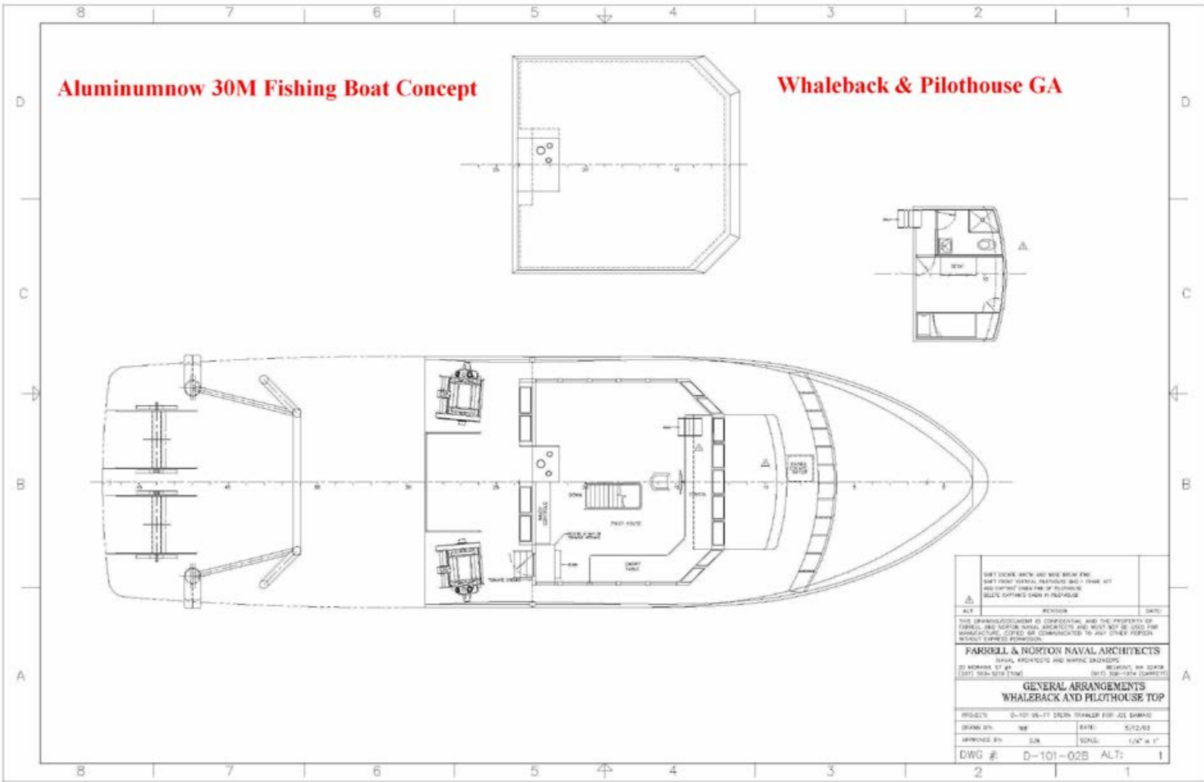

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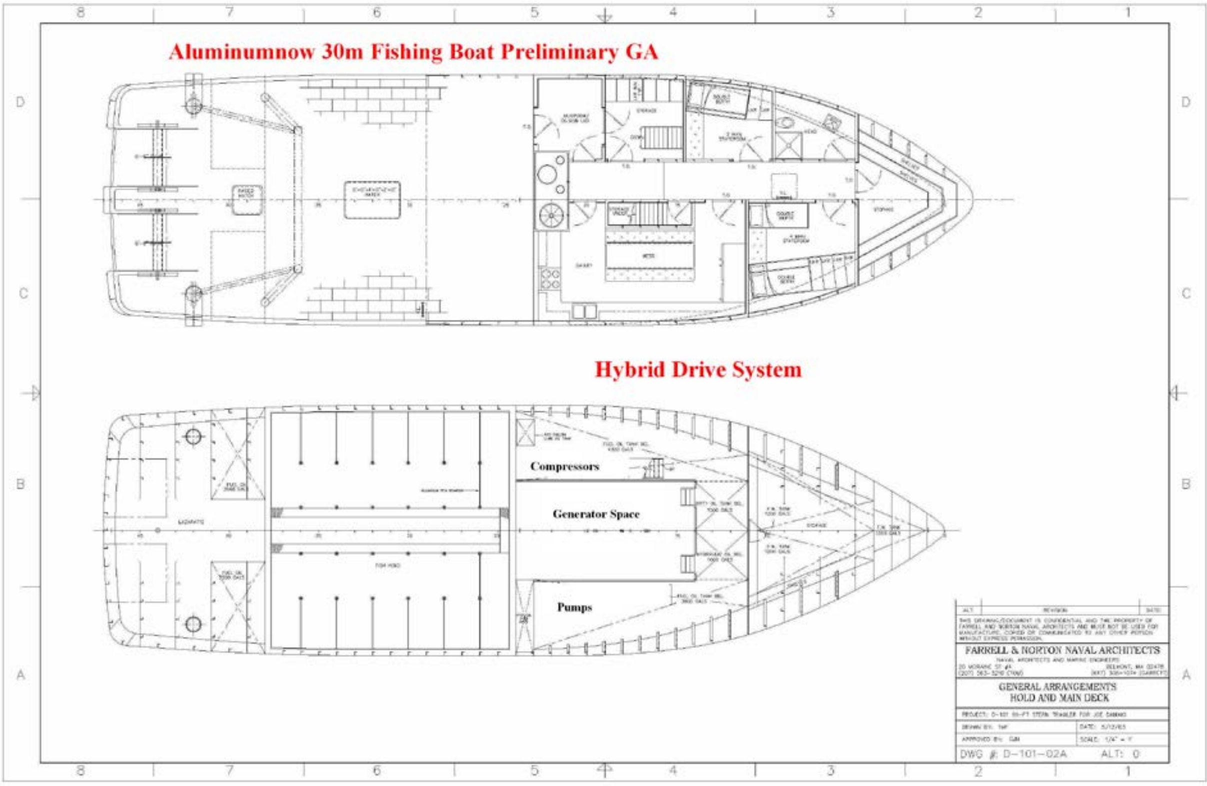

Design Proposals for 20M & 30M Fishing Boats

20m Plus & 30m Offshore Fishing Vessel.

1. Preliminary Stability (Hydrostatics, Intact Stability)
2. Tonnage Calculations - (ITC Tonnage – if needed)
3. Structural Calculations – (To Comply w/ ABS Rules)
4. Drawings to Include:

Lines Plan – Includes 3-D Modelling of Hull
General Arrangements
Outboard Profile
Inboard Profile
Structural Profile
Bottoms Scantling Plan
Longitudinal Bulkheads
Engine Girders
Construction Sections (every frame)
Main Deck Superstructure
Pilothouse Deck Superstructure
Bulwark, Deck Fittings & Doublers
Navigation Lights & Mast Details
Propeller Shaft, Stern Tube, & Strut Details
Rudder Details
Tiller Arrangement Details
Engine Exhaust Details
Grid Cooler Arrangements and Details
Machinery Arrangement
Bilge, Ballast, & Fire piping Schematic
Vents, Fills and Soundings Piping Schematic
Potable Water Piping Schematic
Lube and Dirty Oil piping Schematic

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Compressed Air Piping Schematic
Black and Grey Water Piping Schematic
Fuel Oil Piping Schematic
Electrical One Line Diagram
Lighting Schematic
Inclining Experiment

Estimated Design Costs:

20m - **$71.500.00US** . This include allowance for necessary expenses such as, travel, copying, mailing, etc. as required.

30m - **$78,000.00US** This include allowance for necessary expenses such as, travel, copying, mailing, etc. as required

This price includes one(1) of each vessel, as well as minor changes during the design process.

Fees o of $6200.00 will be charge for duplicate vessel.

This price does not include any changes to the plans for duplicate vessels which will be charged at our hourly rate of $130.00 plus reimbursable expenses.

Approximate Nesting Cost: *20m - **$24,000.00US*** *30m - **$27,500.00US***

The intention is to purpose design the ships to meet client's requirements with hybrid power systems which should lower operational costs and simplify spares and maintenance requirements.

Proposed 20m & 30 Stern Trawler Type Fishing Boats

Minimum requirements -

a)10 x +/- 20m fishing boats probably hard chine and all aluminium
b)20 x +/- 30m fishing boats with steel hulls and aluminium superstructures
c)Single engines (MAN, Volvo or Cats)
d)Box and cold storage
e)Refrigeration
f)Both fresh and salt water shaved ice production
g)Crew of 5
h)Fuel plus a 10% reserve, hold capacity and provisioning for 7 – 10 days at sea

Suitable for –
i)Surface trawling
j)Mid water otter trawling
k)Bottom otter trawling
l)Pair trailing

Proposed designs to be modified to suit clients requirements –

Stern Trawler design No. 1, LOA – 76 ft (23.16m) Beam – 26 ft (7.92m)
Moulded draft – (3.66m)

Main engine – 1 x CAT 720HP Gens – 2 x CAT 372s @72 Kw
Winch engine – 1 x CAT C-18
The proposal is to build this version in marine grade aluminium consisting of 5083 – H116 for plating and 6061 – T6 for extrusions.

Stern Trawler design No. 2, LOA – 99ft (30.17m) Beam – 28 ft (8.53m)
Moulded draft = (4.57m)

Main engine – 1 x CAT @ 805 Hp Gens – 2 x CAT @ 72 Kw
Winch engine – 1 x CAT @ 400 Hp Winch engine back up – CAT @ 150 Hp
Fuel – 15,100 USG (57,153 Litres) Water – 3,700 USG (14,000 Litres) Hydraulic Oil – 1,000 (3,785 Litres)

The proposal is designed to be built with a marine grade class A mild steel hull and a superstructure of marine grade aluminium consisting of 5083 – H116 for plating and 6061 – T6 for extrusions with a tri-clad connection between the steel and aluminum to resist corrosion.

Both of these designs have been built previously and are working successfully. Both designs offer competitive construction costs, maintenance time and operating costs. As well as being from the boards of established architects and marine engineers, both versions have been previously built to ABS classification

Recommendations –

A recommendation would be made for the use of Diesel / Electric power based on an operation redundancy and cost point of view. Diesel / Electric represents the generation of electricity and its use to power electric motes to provide propulsion and service energy. The concept was first used in 1909 and has been used since and improved with new materials and technologies (a recent example would be the Queen Mary II ocean liner) which could be used to advantage would be on this project –

Conventional power systems -

The energy producers are -

1) The 30.17m trawler utilizes –
A) 1 CAT @ 805 Hp for propulsion
B) 2 CAT @ 72 Kw for domestic power
C) 1 CAT @ 400 Hp for winch hauling
D) 1 CAT auxiliary winch hauling engine in case of the failure of item C

This represents four different models of engine as well as the fact that all units have a dedicated purpose, electricity production, prime propulsion and equipment handling. This means –

E) It is required to be familiar with all the models as well as carry four sets of different spares (injectors, injector lines, filters, fan belts, cooling pumps and replacement impellers, etc.) to resolve the maintenance and repair of each unit
F) A lack of redundancy except for the twin generators for service power, but otherwise there is one propulsion engine. The auxiliary hauling engine would be able to recover the fishing gear but fishing operations would probably need to be suspended until the main unit was repaired.
G) Fuel consumption would be higher and wear on the engines will be higher than necessary due to light loading. As an example the hauling engine will be lightly loaded in standby and will only be at the efficient load when actually working at hauling nets.

Diesel / Electric systems –

If we take the conventional power system with propulsion, electricity generation and gear hauling we have a power requirement of +/- 1,300 Hp (970 Kw, this can probably be reduced as you wouldn't haul your nets in while maintaining full power for propulsion) If we were to split this between four (4) generators producing about 240 Kw each we solve these points =

H) We reduce our spare parts inventory by a factor of four as we only need to carry spares for one type of engine and the engineer need on be familiar with one type as opposed to four.
I) Redundancy, If one generator should fail then we are only reduced to 0.75 of our power with four generators but a single system is not put out of action as power is always available and can be re-diverted
J) Wear is reduced as well as improved fuel economy if each unit is operating at a minimum load of 70% and as the system can be set to start each unit on demand this is achievable. As an example if we have four generators operating at 70% efficiency to supply the required Hp then we can shut one down and the remaining three are producing the same power at 94% load but with a fuel saving of at least 20% and a lack of wear and maintenance on the inoperable unit

K) Economy, Tugs and trawlers have large engines to pull large loads = nets and other vessels. In the case of fishing vessels this power is not required when moving from the port to the fishing grounds or the reverse trip. So economies can be realized by only running enough of the four generating units to supply enough power at the time required.

L) Modern electric motors are very efficient and in the case of the conventionally propelled vessel the propeller shaft length can lead to problems in alignment and lubrication. In the case of Diesel / Electric propulsion the only requirement is an electric cable that does not require a straight run

M) Manoeuvrability, can be improved dramatically through the use of a fully azmuthing pod, the entire unit rotates and consequently does not require an additional rudder. But as a system this is a more expensive option

N) The majority of the equipment for these vessels can be delivered with electric drives (propulsion, winches. net hauling equipment, etc.) this again is more efficient as each change in power source (converting mechanical or electric power into hydraulic power as an example) produces a power drop and inefficiency.