

Shell Shipping



Gallina in Singapore, January 2003

Our Company

Shell Shipping is the shipping arm of Shell International Trading and Shipping Company Ltd (STASCO) which provides services to the Royal Dutch/Shell Group Operating Companies and third parties around the world.

As a major player in the marine industry, Shell currently manages 47 oil and gas tankers. Each year, we deliver 200 million tonnes of oil to terminals worldwide, use 5,900 barges, make 43,000 bunker deliveries and 91,000 cargo transfers operations. We also deliver 79 million cubic metres of LNG, man and manage 22 LNG carriers and deliver 3.5 million tonnes of LPG. We negotiate 2,300 global freight fixtures and spend US\$2.2 billion annually.

Shell Shipping Technology

Shipping Technology is the ISO 9001: 2000 certified technical consultancy group within Shell Shipping established in 1960.

We provide independent and high quality marine and engineering consultancy, shipbuilding and project management services to clients worldwide.

Strategic and Commercial Advice for New Projects

Our unique blend of diverse technical skills and experience enables us to offer a wide range of specialist consultancy services to our client base which consists of Shell Group of Companies, Operating Units, and Shell Joint Ventures worldwide.

Over the past 4 decades, we have grown to become a truly international organization with presence in the world's major shipping locations in Europe, the Americas, the Middle East, Asia and the Far East. From London, we provide an unequalled network of marine and engineering expertise and global marine services to our clients around the world.



Shell Trading

Our People...

We believe that the key to our success lies not only in our core values of honesty, integrity and respect for people, but also in the wide range of technical skills and expertise our personnel can bring to bear in servicing the needs of our clients.

Our experienced international staff of professionally qualified master mariners, naval architects, multi-disciplined engineers and surveyors are able to form a rapid appreciation of clients' requirements and to respond effectively to these needs either individually or as multi-disciplined teams. This enables us to tackle any task, from a straightforward routine survey to the most complex, multi-disciplined problems and casualties.



Naval Architects working on projects

Our Master Mariners...

Our Master Mariners have command experience and some also have shore management experience as marine superintendents, pilots, rig movers and fleet managers. They come from a broad background with experience in oil, chemical and gas tankers, bulk carriers, general cargo vessels, salvage, towage and offshore construction vessels.

Our Naval Architects...

The Naval Architects have specialist knowledge in ship and offshore floating structure design, construction and operation, classification societies and ship research. This provides a completely integrated holistic approach to activities which include concept studies, newbuild and conversion projects, ship surveys and casualty investigations including collision analysis and ship safety studies focusing on strength and stability

Our Marine Engineers...

Our Marine Engineers are similarly experienced, having served as Chief Engineer and also ashore in superintendent roles and management roles or in classification societies as Surveyors. Hull and machinery problems, bunker disputes, newbuilding disputes and structural surveys are strong features of their expertise.

Our Electrical, Instrumentation and Control Engineers...

Our Specialist Engineers have many years experience in the design and construction of power distribution and main control and automation systems for Oil Tankers, LNG vessels and Floating Production and Offshore Storage vessels. This enables them to provide expertise on newbuild and conversion projects, as well as provide major input to the design of power distribution and controls systems incorporating the latest technical innovations.





Our Services...

Our business involves us in a wide variety of maritime matters, from project management of newbuild and conversions to marine consultancy, surveys and audits. In each of these areas, we are able to investigate, advise, analyse and survey as necessary, in accordance with our client's instructions.

The professional services we offer include but are not limited to:

- Engineering design and concept feasibility
- Naval architecture
- Intact and damage stability calculation and assessment
- Specification writing for major refit and conversion
- Project management including plan approval and provision of technical on-site supervision
- Marine safety audits and vessel condition surveys
- Technical and commercial risk assessment
- Maintenance of single point mooring buoys and systems
- Procurement and distribution of spares and equipment
- Marine and electrical repairs
- Quality Assurance approval assessment and implementation

In addition, Shipping Technology applies its engineering expertise to:

- Ship's hull
- Tank arrangements
- Accommodation
- Helideck
- Naval architectural calculations
- Structural strength and fatigue analysis
- Mooring system integration
- Power generation and distribution facilities
- Ship-related utility systems
- Safety systems
- Engine room systems
- Instrumentation and control systems
- Cargo and ballast handling
- Export metering
- Oil and gas separation facilities
- Oil stabilization
- Gas treatment
- Gas compression
- Seawater injection facilities
- Topside related utility systems
- Flare systems
- Tandem mooring and offloading systems

The Future...

Even in the new millenium, shipping remains as essential as it ever has been to the successful functioning of global commerce.

An increasing number of rules and regulatory systems pose new requirements and obligations on shipowners and their operations, whilst shipping related issues, incidents and casualties receive ever greater attention from the world's media and the general public, particularly in regard to environmental issues.

As shipping lanes, waterways and ports continue to become more and more congested and scrutiny of the shipping industry increases in its intensity, we at Shell Shipping Technology are and will remain dedicated to providing an independent, high quality service to respond rapidly and effectively to the needs of the shipping industry in the 21st century.

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Summary of Services

The scope of services on offer from Shell Shipping Technology encompasses the complete range of Marine & Engineering Design tasks.

Throughout all stages of the design process, we utilise fully integrated 'industry standard' computer systems to provide comprehensive design support from the concept and feasibility stages through Class, Statutory and Owner plan approval, through to the provision of project management services. Accordingly, we are able to provide the complete design solution for the following extensive range of services:

NEWBUILD, CONVERSION AND REPAIR PROJECT SUPPORT AND MANAGEMENT

- Design/draughting services including structure, hull form, intact and damage stability, accommodation arrangements, engine room installations and systems, and electrical design
- Specification writing
- Plan approval
- On site supervision
- Resistance and propulsion analysis
- Sea-keeping and manoeuvring analysis

COMPLIANCE WITH REGULATIONS

- Damage stability and damage consequences diagrams
- Shipboard Oil Pollution Emergency Plans
- Lightship Surveys and Inclining Experiments
- Stability Books, Loading Manuals and Longitudinal Strength
- MARPOL double skin requirements
- Classification Society Rules

PORTS & TERMINAL SERVICES

- Operational Troubleshooting
- Manoeuvring Simulations
- Ship Shore Compatibility
- Tugs Negotiation
- Sales and Purchase Agreement Advice
- Tugs Management and Installation

VESSEL ENHANCEMENT PROJECTS

- Increased crew and passenger complements
- Increased freight capacity
- Improved accommodation facilities
- Vessel lengthening
- Stability enhancements
- Speed enhancement
- Improved manoeuvrability
- Additional power generation plants
- Alternative propulsion systems
- Engine room reconfiguration

ELECTRICAL DESIGN

- Switchboards, Control panels
- Power plant/Power Plant upgrades
- Feeder Systems
- Thruster Control and Navigation Consoles
- Fire Detection Systems
- Distribution systems: Low, medium and high Voltage
- Intrinsically safe and other specialised installations

OTHER SERVICES

- Ship search, suitability and comparison studies for conversion projects
- Project Management
- Transfer of manual drawings into CAD (e.g. for presentation drawings such as 'Fire Control & Safety' plans)
- Contract draughting services to other yards and consultants
- Ship surveys for current Owners and potential purchasers
- Scanning of drawings in raster format with automated vector conversion for storage
- Procurement management
- FMEA studies
- Safety case and Specialist Surveys



Marine, Ports and Terminal Advice

General and specialist surveys are undertaken by Shell Shipping Technology personnel who have established an excellent reputation and gained a wide range of experience in the field of surveys, audits and safety cases throughout the marine industry.

All surveys are carried out by experienced Marine Engineers and Master Mariners who are fully conversant with all relevant statutory regulations and regulatory bodies requirements such as SOLAS and MARPOL.

The surveys/audits include the vessel's documented safety management system through to its application on board the vessel and the physical inspection of the equipment.

A wide range of surveys have been carried out by our Engineers on an extensive range of commercial, naval and specialist offshore vessels, including:

- Safety cases
- Thermographic surveys
- Condition surveys
- Dynamic positioning audits
- Pre-purchase survey
- Shipyard supervision

As projects move into a consolidation phase, the need to ensure that proper operational management is in place grows stronger.

Experienced negotiators would assist to support the running of your terminal operations, negotiate new tug contracts, cargo expediting services, vessel clearance and contracting strategies.

Our staff can assist in creating appropriate business processes and practical procedures for supporting daily operations. Our staff can also play the role of expert troubleshooters on an ad-hoc basis.

The impact of upcoming legislation on marine operations will be significant. Shipping Technology can assist in diagnosing the marine risk for your business in line with the latest developments on maritime rulings.

Shell is committed to developing a global leadership position in the Liquefied Natural Gas (LNG) industry. New market development activities need to be undertaken urgently. From LNG ship/shore safety studies to vessel interface and compatibility (as part of the opening of new trade routes) and Sale and Purchase Agreement (SPA) shipping advice, Shell Shipping Technology is ready to provide the necessary expertise to make the right decisions.

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Project: Sakhalin II Oil and LNG, Russia

Marine Advisor in both oil and LNG gas production Provision of advice for LNG terminal port development



Project Support

Shell Shipping Technology aims to be your partner in managing the marine aspects of your projects. Many times, in managing new greenfield projects you may require advice on shipping requirements consisting of types of new ships, sizes, number to build/buy and availability. If the decision taken is to buy, we can provide a one stop solution in managing the Sale and Purchase Agreement. If the decision is to tender for the best deal, we can help with pre-tender pre-qualification preparations, recommending the ideal subcontractor or shipyard to award the marine contract to and finally, tender review. This is relevant to projects from Shell Gas & Power (G&P) and Shell Global Solutions International (SGSI).

As part of the growth in LNG trade, new LNG terminals are being built. Shipping Technology is capable of assisting in this activity with our experts providing technical advice on port site selection analysis (taking into account not just geographical but political and technical constraints), port design and layout (to minimise health and safety concerns and maximise the use of space) and feasibility assessment (in go/no-go decisions). Related to new terminal development is terminal de-bottlenecking. As the LNG trade develops, terminal extensions need to be built. Our team of experts will be able to assist in anticipating the additional requirements to transform your port to world-class standards.

In Shell Exploration and Production (EP), projects that have an element of marine risk may benefit from having an advisor from Shipping Technology on standby. In the case of offshore construction and installation, our marine advisor would help to set up the necessary procedures according to international conventions, act as site representative, provide hands-on supervision and create written procedures to help manage the risk associated with operating at sea.

- Marine contract, tender review and pre-tender pre-qualification
- Sale and Purchase agreement
- Terminal debottlenecking
- LNG port site selection
- Port design/layout
- Port site selection analysis
- New terminal development
- Feasibility assessment for ad hoc new ports and terminals
- Shipping requirements for projects: type, size, numbers available
- Project support for offshore construction and installation to EP eg procedures, site representation
- Hands-on supervision of operational activities
- Marine support to major (non-marine) projects such as EP, OP, Chemicals
- Written procedures for marine projects



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Multidimensional Project Support

Services to Shell Exploration and Production (EP)

- Conceptual design (project support)
- Tender management
- Tugs inspection
- Supply boats
- Marine offshore
- Procedural review
- Execution
- DP vessels
- Tow management

Services to Shell Oil Products (OP)

- Port and Terminal inspections
- Audits
- Port operational advice
- Moorings
- Navigation
- Design changes
- Marine troubleshooting
- Project support
- Ship/shore compatibility
- Industry representation/standards
- Casualty support
- Central/global procurement*

(* Central procurement eg SBM mooring ropes, MBCs, servicing of MBCs)

Services to Shell Gas & Power (G&P)

- Ship and port approval
- Scouting studies
- Contract reviews
- Ship shore compatibility
- Concept review
- Manpower
- Terminal vetting
- ADGENT support
- New technology (FLNG/FSRU)
- Marine support of projects

Services to STASCO

- Operational support
- Ship visits
- Support to Shell Trading (OTC, OTP, OTIG) and Shell Fleet
- Cargo measurement expediting
- Buoy safety
- Port risk assessment

Services to Shell Global Solutions (SGSI)

- Project support for Oil & Gas Global and Downstream:
 - o Concept
 - o Design
 - o Feasibility
 - o Execution
- Ad hoc/general marine advice
- Terminal de-bottlenecking
- Concept review
- Loss review

Services to Shell Operating Units (OpCos)/JVs

- Expediting cargo management
- Provision of manpower
- Project support
- Port infrastructure
- Port ship fit
- Ad hoc advice
- Demurrage and debottlenecking

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Port and Terminal Advisers

Shell Shipping Technology is best positioned to assist with many aspects of safe ports and terminal operations. We maintain and update a database on ship shore compatibility, which is useful to determine fit for LNG ships interested in servicing new ports as part of the growth in LNG short term trades. This database and our expert advice help to save time in setting up chartering agreements.

The Charter Party Safe Berth Clause requires a terminal to be inspected for safety reasons before the agreement can be entered into. Our team of master mariners regularly conduct terminal vettings, technical audits, mooring analysis and risk assessments to ensure that a particular port and terminal is safe for use. These oil inspections are comprehensive in scale and scope providing an added assurance towards the safety and reliability of a particular port of call.

We have many years of experience in advising on terminal operations. With the recent growth in LNG trade, many new ports are setting up for operations. We can provide advice on LNG terminal setups from setting up procedures, hardware specification and purchase, to advice on maintenance policies and navigational routes. Our experts are also able to assist in tug contract negotiations, which often requires an insider's knowledge of provider's capabilities and experience.



- Risk assessment of ports and terminals
- Ship shore compatibility
- LNG terminals - procedures, hardware, maintenance, navigation
- Ship terminal "fit" (Chartering)
- Produce procedure technical manuals
- Ship shore interface LNG berth/offshore
- LNG ship shore interface
- Port and terminal inspections (for Charter party safe berth clause)
- Port terminal audits
- Port terminal information databases
- Tug contract negotiations
- Surveys of ports and terminals
- Terminal vetting
- Terminal (oil) inspection
- Procedures, hardware, maintenance, navigation
- Mooring analysis
- Terminal technical audits
- Terminal operations management
- Port operations advice/audit

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Cargo Expediting Services

Has the oil you have paid for been loaded into your vessel?
Is the cargo operation being carried out safely and efficiently?
Is the ship leaving the discharge port with some of your oil still on board?
Is the demurrage claim you are about to pay fully justified?
Has this oil been correctly measured and accounted for in the receiving terminal?

Statistics show that most companies buying oil FOB or C&F, are paying for a bill of lading figure which is often overstated. Sometimes the overstated tonnage is in the form of water, sometimes it is a result of poor sample testing or incorrect calculations and sometimes the overstated tonnage is just that - overstated. We can help you minimise oil loss from all the above.

A group of master mariners, all of them having spent many years as Chief Officers on our vessels are given additional training in laboratory techniques and shore tank farm practices. As Shell Expeditors, they will travel to any port in the world to look after your interest exclusively.



On location, our expeditor will:

1. check that the bill of lading quantity is a true reflection of what has actually been loaded. If it is not correct, he will make sure you have all the necessary details to enable you to claim against the supplier;
2. gather information on the vessel to which you have entrusted your cargo. Valuable information such as crew standards and ship deficiencies can be used to support a claim against the shipowner should the need arise. At the very least, it will assist you to decide whether or not to use that vessel again;
3. monitor the performance of the terminal and highlight any procedures which do not comply with normal industry standards. This will provide you with valuable evidence to support any future claims;
4. use his experience (and mariner to mariner contact) to ensure that the operation is carried out safely and efficiently. He will ensure that the ship staff place maximum emphasis on minimising "remaining on board" quantities at the discharge port. This includes the supervision of all crude oil washing and draining operations.

We can help you save time and money in the long run.

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Offshore (Exploration and Production) Expertise



There has been tremendous growth in demand for Shell "in-house" marine offshore expertise in recent years. In new projects such as Bijupira-Salema, Sakhalin II, Cawthorne Channel Gas and within existing EP operations, Operating Units are recognising efficiency and HSE benefits, and the contribution to bottom-line cost effectiveness, of utilising highly qualified and experienced Shell marine staff at project conception through to completion.

Shell Shipping's team of marine professionals have variously fulfilled a portfolio of high-level marine positions within Shell and other companies, including Master, Pilot, Loading Master, Operations and Terminal Superintendent, Rigmove and Tow Master, Warranty Surveyors, Ship Inspectors, Marine Contract Managers and Logistics Managers. This range of experience and capability is enhanced with Shell HSE values and Business Principles, working within an ISO 9001 accredited organisation, that together fulfils all expectations of a demanding client.

Inclusion of our marine personnel in projects will benefit HSE, on-time delivery and within-budget targets by recognising and dealing with potential marine issues from an early stage, enabling solutions to be proactive rather than reactive.

- Tugs and drilling rigs
- Inspections: barge, DP, supply, anchor handling
- Offshore marine support safety audits
- Buoy mooring support (hoses competence)
- Tugs/towing berthing/ocean
- Rigmoving: supervision, planning, procedures
- Tow management

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Offshore (Exploration and Production) Expertise



Towing out concrete hull gas module



Loading a gas module onto a semi-submersible



Load-out completed

Our EP related activities and services include:

- Rigmoving: infield and ocean tows, supervision, planning, procedures, and final positioning/locating

- Wet and dry tow management from tug selection, semi-submersible transport selection, towing equipment, route planning and tow/voyage plan compilation

- Marine audits and risk analysis: logistics operations, lifting operations, pipelaying, towing, mooring and anchoring, drilling rigs and stimulation vessels, FPSOs

- SBM/FPSO operations: procedures, pilot/loading master selection, mooring hawsers, hose and MBC installation and management

- Verification of offshore support craft and installations for logistics/operations through specification review, inspections and operability assessment relative to the proposed operating environment: terminals, passenger vessels, tugs, supply, utility, standby vessels, AHTS, accommodation barges, crane and pipelaying barges, liftboats and stimulation vessels, dynamic position vessels

- Procedure conception for all offshore marine operations and logistics activities

- Technical input to contract tenders: scope of work, specifications of vessels tailored to the operation and environment

- Pre-qualification of marine contractors prior to tender and contract tender assessment and clarification

- Contract tender management

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People and Standards

An increasing number of rules and regulatory systems pose new requirements and obligations on terminals, shipowners and their operations alike, whilst shipping related issues, incidents and casualties receive ever greater attention from the world's media and the general public, particularly regarding environmental issues.

In this challenging operating environment, Shipping Technology acts as the focal point to engage and lead industry bodies with appropriate representation in order to positively influence change. Where these changes will impact Shell Operating Companies, our experts are on hand to provide direction and global advice on assessing the impact of new legislations on existing operating procedures. This includes provision of appropriate expertise to Shell companies and projects.

We provide ad-hoc marine advice, troubleshooting assistance, navigational risk management, casualty support, manpower and technical compliance advice on Shell HSSE policies. These value-added services are part of an entire suite of competencies designed to serve you better.

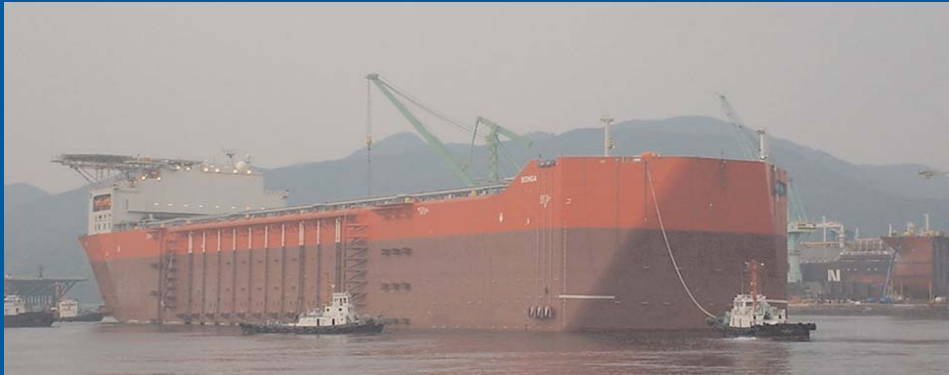


- HSE advice
- Ad hoc marine advice
- Navigational risk management
- Trouble shooting
- Industry representation and direction
- Industry body participation/liaison
- Industry liaison on ports, terminal and safety
- Global advice on new legislation
- Engagement with industry bodies eg SIGTTO, OCIMF, ICS, IAPH
- Development of Industry and Shell Standards
- Technical HSE issues
- Corporate memory
- Industry contact database
- Casualty support
- Provision of manpower and coordination of Marine Technical Advisors worldwide
- Development of new ideas
- Ship manoeuvring simulations
- Buoy mooring and floating hose management

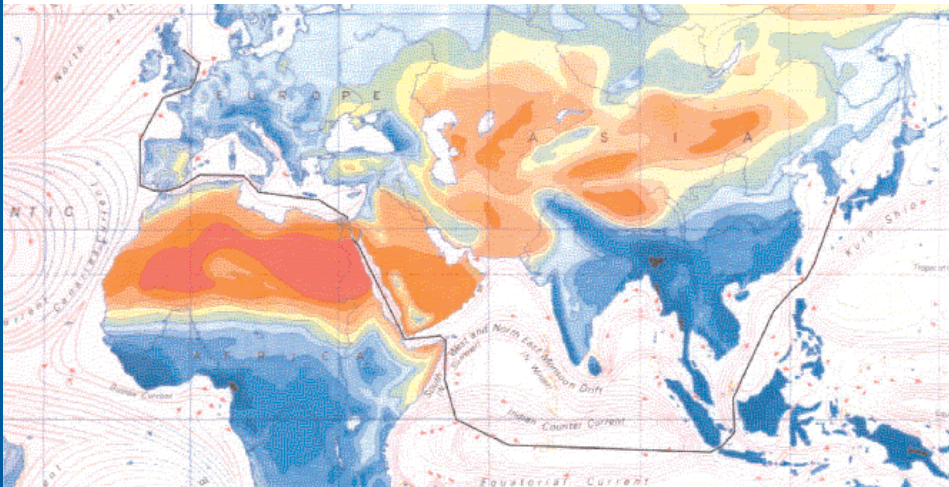
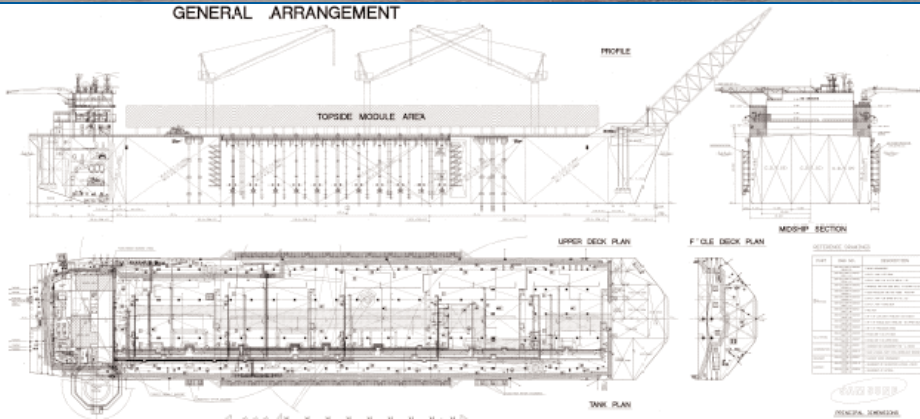
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'Bonga' FPSO Voyage: Korea-UK



GENERAL ARRANGEMENT



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'Bonga' Details

Purpose built FPSO - 2,000,000 barrels capacity

Main dimensions:

L.o.a.	305.1m
Width (moulded)	58.0 m
Width (waterline)	67.0 m (extreme)
Width (maximum)	74.0 m (incl. Stbd helideck)
Hull Depth	32.0 m
Displacement	394,234T
	@summer draft 23.97 m

Field 120km SW of Warri

Spread moored - 12 suction anchors

1030m water depth

Export through SBM buoy (min 1 mile east)

'Emergency' export - tandem mooring

'Bonga' General Arrangement

Forward Flare Tower

Recessed boarding stairs located at the stern.

Bottom platform of the ladder/staircase is at 10m

Nigerian registration, classification is by LR

Voyage: Korea to Offshore Tyne

18 June-10 October, 2002

Distance: 12,800 miles

Speed: 4.91 knots

Tow draft: 9.5m mean

Forward: 8.5m

Aft: 10.5m

Displacement at tow draft: 150412T

Tugs

'SmitWij's Singapore': 13,500/190

'DeDa': 20,800/200

'SmitWij's London' (after Suez): 13,500/170

'John Ross': 19,200/200

Suez Tugs

Baraka I: 120T Bollard Pull

Baraka II: 100T Bollard Pull

'Bonga' FPSO Voyage: Korea-UK



Suez Transit
9-11 September 2002

Hull Arrival, Tyne
Arrival off Tyne 10 October 2002
Delay to Tyne Transit
Weather parameters for entry exceeded
Poor forecast weather conditions in North Sea
Entry 'tidal window' missed

'Safe Haven' - Keppel/Verolme, Botlek
20 October - 10 November 2002

Rotterdam - Offshore Tyne
10 November - 14 November 2002

Tyne Transit
Bonga beam inc protection frames - 67m
Tyne Tow pennants - 20m (four in total)
Distance between the piers - 360m
'Herd Groyne' - narrowest point - 184m
Channel width (bet piers/Herd Groyne) - 120m
'Bonga' width (inc tow pennants) - 107m



Simulations - South Tyneside College
Port of Tyne pilots, tug masters, towmaster, warranty surveyor, Shell project personnel were involved in the simulation exercise. Tug power and disposition was determined initially by evaluation of wind and current effect. Over 30 simulator runs with Tyne pilot and tug masters assisted in the exercise. Specific tug placement and required power were modified and further verified during simulated transits.

Transit Parameters
Local knowledge and marine experience was used in conjunction with the South Tyneside College simulator to derive and verify both operational and environmental parameters. There is a 50% redundancy factor i.e. the tug power is double that required, this allows for possible unforeseen increases in wind, and possible tug failure

Environmental Parameters
Maximum wind 10 knots in any direction
Neap tide/low water at Tyne entrance
Optimum transit speed 3 knots

Transit Tow Plan
'Bonga' towed stern first
1 tow tug (sws) - 1 trail tug BP 120T
4 manoeuvring tugs with total min bol pull 200T
2 escort tugs - each min bol pull 80T

Operational Control
Tow Master responsible for the tow
Tyne pilots onboard 'Bonga', lead tug and trail tug
All tanker berths vacant during the transit
All other River traffic suspended

Transit Preparations
De ballast to 5.2m draft (actual 5.4/6m)
Monitoring of weather conditions
Initial team deployed by helicopter
Stern access used by pilot

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