Project Delivery

Safety

Performance

Quality
Harris Pye offers clients in the oil & gas sector unique and innovative solutions, whilst still upholding exceptional performance, quality and safety levels.

Harris Pye offers in-situ repair, upgrade and conversion of rigs, semisubmersibles, trading tankers, FSU, FSO, FPSO and FSRU units, and inspection and consulting services for the LNG industry. Our state-of-the-art, in-house facilities enable us to provide comprehensive overhaul, conversion and refurbishment services. Our expertise includes automation and control engineering; electrical work, construction steel works, high and low-pressure pipework, specialist welding, heat treatment and mechanical works, including pumps and compressors, HVAC, accommodation modules and outfitting. We were involved in pioneering projects in the 1980s, when FPSOs and FSOs were still experimental. We made key contributions to developing the safe use of dual fuel for boilers, as well as safe and practical application and installation methods. We have been involved in more than 45% of the world’s FPSOs from conversions to new builds.

**Our underlying strengths**

**Quality**
- Compliance with all major classification societies and client requirements
- API accredited
- ISO 9001
- ASME ‘R’, ‘U’ and ‘S’ accreditation at our Sharjah, Kingdom of Saudi Arabia and Singapore facilities
- EN 1090-1EXC2

**Safety**
- BS OHSAS 18001
- Full liability cover
- Full risk analysis

**Environmental**
- ISO 14001
- Managed internal recycling programmes
- Environmentally friendly materials are used wherever possible, from marine coatings to stationery
- Green technology: the supply, installation and maintenance of environmentally friendly systems and equipment, e.g. ballast water treatment, exhaust gas scrubbing, low sulphur technology
Engineering Design

Engineering design is a series of steps which leads towards a complete solution. The lifecycle of a project is usually initiated by a conceptual design or design requirement. This process can then be brainstormed and a preliminary feasibility of the ideas and designs can be collated. This may consist of preliminary sketches, analytical decisions on the materials, construction, installation, manufacturing and fabrication process, maintenance, financial feasibility and the timescale of the project.

Once the plans have been finalised, the review process is required to investigate the environmental impact and efficiency of the design.

Design Process

All designs will be to a regulatory code or standard, which outline the minimum requirements for a particular region or area. The codes and standards also provide the analysis procedures required for different types of structures. The purpose of these regulatory codes or standards are to ensure a safe design life for the intended purpose of the structure/building, in all eventualities.

Project Planning

During planning, we detail all stages of the project timescale, design and analysis, construction/installation and maintenance.

Project Execution

Harris Pye offers a full turnkey solution for all client’s projects if required.

We can handle everything from the initial client enquiry and on-site survey, through to detailed design engineering, on-site installation and final commissioning. A senior project engineer is available 24/7 and is able to mobilise at any time. Harris Pye ensures after sales support for all projects undertaken.
Harris Pye is a key player in the provision of marine and offshore structural steelwork, with our own in-house design, engineering, fabrication, installation and quality departments. This allows us to provide full turnkey project packages to clients.

We have our own (class approved) welding and fabrication procedures, which eliminates the need for any additional costs to our clients.

With a vast range of the latest technology (including our own 3D Laser Scanner and stress analysis software) we can provide a second to none stress and alignment analysis service.

We offer the highest quality and grades of materials to ensure we meet the requirements of our clients and also classification society approval.

Products supplied include:
- Hull plates
- Stiffeners
- Foundation steelwork
- Platforms

The welding section has an Armco column and boom submerged arc- welding machine that can competently weld 4.5m in diameter, over a 6m track with roll manipulators. Our manual welding capabilities are extensive, with hundreds of coded welders and welding procedures.

In the Group’s UK workshop there are large areas of floor space which can be utilised for laying out and for fabrication assembly.

In addition to this, we have our own in-house blasting bay and separate temperature controlled paint bay. Within our main workshop, we have segregated stainless steel pipework and fabrication shops.
Pipework

Harris Pye offers clients a full design and installation service for pipework and high pressure pipe line systems. Pipework systems for cooling water, hydraulic control systems, fire fighting systems, etc. are offered in a wide range of specialist materials such as:

- Ferrous
- Non-ferrous tubing, pipes and fittings
- Cryogenic
- PVC
- GRP
- Hydraulic
- Stainless steel pipes and fittings

The full design service includes initial survey; production of drawings for Class approval by way of a full CAD system; and preparation of a full scope of work and specification of materials. The design, supply and installation process is carried out in full accordance with Harris Pye’s ISO 9001 Quality Assurance system. This system ensures full traceability of all aspects of a particular project.

Electrical Switchgear

Maintenance and servicing of marine control and instrumentation is the core activity of Harris Pye. Our engineers have a wealth of experience in pneumatic and electronic control systems in marine and land-based industries. We can offer service and repairs to all types of control equipment.

The servicing of high voltage electrical equipment and switchboards is of a specialised nature. The competence of our engineering staff means that we can undertake a wide scope of works, including:

- Switchboard surveys
- Thermographic imaging
- Servicing / calibration of protection devices
- Servicing of breakers / current injection testing
- Design, installation and commissioning of new or retrofit systems
Instrumentation Services

Harris Pye’s Electrical and Instrumentation department has a team of experienced engineers, with the ability to design, build, install, commission and maintain electrical and instrumentation control systems. We work for the marine, oil and gas, petrochemical and power industries in the following areas:

- Boiler combustion control, burner management and feedwater control systems
- Alarm, monitoring and data acquisition systems
- Inert gas control systems
- Process pressure / temperature / level / viscosity control systems
- Cargo handling control systems
- Fixed and portable tank gauging and monitoring systems
- Fire and safety system servicing and certification
- Service, repair, calibration and certification of fixed and portable gas detection equipment
Repair and Conversion

Harris Pye has more than three decades of experience in all areas of ship repairs and conversions. Our expertise covers everything from repainting to full mechanical servicing - including engine overhaul and reconditioning, in-situ machining, propeller servicing and renewal. We also offer outfitting - soft furnishings, accommodation modules, refrigeration, HVAC, insulation, galley and stainless steel design, manufacturing and installation.

**Services**
- Engine overhaul
- In-situ machining
- Propeller service
- Outfitting and Accommodation
- Galley and stainless steel design
- Galley and stainless steel manufacturing
- Galley and stainless steel installations
- Ballast water treatment
- Exhaust gas scrubbing
- Low sulphur technology
- Boiler repairs, service, surveys, testing
- Boiler troubleshooting and repair
- Deck boilers
- Electrical switchgear
- Instrumentation and control
- Pipework
- Riding squads and yard services
Protective Coatings

Protective coatings for tube plate protection are 100% solid polymeric epoxies, formulated to cope with conditions such as abrasion, corrosion, contamination and galvanic action.

FPSO and FSO Conversion

Harris Pye has major experience with FPSO and FSO conversions.

- We were involved in pioneer projects when FPSOs and FSOs were still at the experimental stage in the 1980s.
- We made key contributions to developing the safe use of dual fuel for boilers, as well as safe and practical application and installation methods.
- We have been involved in more than 45% of the world’s FPSOs, from conversions to new builds.
- There are currently 90 FPSO’s in operation globally - we have been involved in over 40 of them.

Through all stages of conversion, from conception to final commissioning, our highly experienced and dedicated contract engineering teams obtain relevant approval, and undertake all design work, calculations, fabrication, installation and commissioning.

We ensure that all stages of programming and works undertaken are subject to, and comply with, the latest Class, USCG and Quality Assurance regulations and are guaranteed accordingly.

All aspects of conversions are offered, including, but not limited to: remedial boiler works, installation of multi-fuel system burners and all associated service lines - especially gas and crude oil supply systems. All mechanical, control, electrical and automation aspects are covered to complete conversions on a turnkey basis.

On-station repairs and inspections can be carried out during production, saving valuable time and money.
Reports and Inspections
The reports generated from inspections can form the basis of repair specifications used for classification and underwriting requirements, or form a database for future condition monitoring. General marine plant can be surveyed using the following:
- Optical alignment
- Vibration analysis
- Thermographic analysis
- Analysis of lube oil

Boiler Troubleshooting and Modelling
By adopting a scientific approach to troubleshooting, we are able to resolve even the most complex and exclusive issues, including efficiency improvement and redesign whilst still maintaining a remarkably high success rate.

Our boiler performance computer modelling facility enables us to set up a simulated model of a boiler and assess an infinite number of operating variables.

The effect of major changes in the heating surface or boiler geometry can be assessed in a matter of minutes, making our equipment an extremely powerful problem solving tool.
Boiler Design, Tender Preparation, Contract and Site Administration

We are specialist boiler designers, constructors and problem solvers. Our team has built and designed boilers for some of the largest boiler companies in the world including B&W, NEI and ICAL. Many of the problems inherent in a boiler plant are caused by errors of judgement and short cuts taken in the original design of the boiler. By correctly specifying the equipment from the outset we can prevent such problems from occurring. In addition, our independent assessment of the plant can identify design flaws, which can be rectified prior to the boiler coming on-line.

If you are planning on purchasing a new boiler we are happy to liaise with you at all stages of the boiler construction. We can either design and build your new boiler from scratch or operate independently in the supervision of its design and construction.

This would include the following stages:
• Tender preparation
• Design appraisal and assessment
• Contract and site supervision
• Commissioning of the plant
• Personnel training
• Ongoing support

Boiler Circulation Analysis

Globally, we are the only steam engineers who can independently assess the internal water circulation of any sub-critical boiler.

Our computer based circulation modelling facility has been extensively field tested, with both conventional primary element flow measurement equipment, and radioactive tracer techniques carried out by the Australian Atomic Energy Commission.

Harris Pye Steam Boilers

These boilers, which are intended primarily for use on marine installations, can easily be adapted and modified for use in any number of applications where there is a requirement for power and / or process steam.

Each boiler package will be custom-designed to meet the requirements of individual customers. We can undertake all aspects of the design in-house.

These include - but are not limited to - thermal design and associated activities, skid and module design and layout, including stress analysis, as well as naval architecture requirements.

Harris Pye will be responsible for all aspects of design engineering, manufacture, installation and commissioning, including aftercare of the boilers and all associated module plant and equipment.

All boilers are designed and manufactured in accordance with ASME and BPVC codes.

The boilers and associated equipment are available either fully assembled or in flat pack form from the Harris Pye manufacturing facilities in the UK, China, UAE, Singapore or Brazil, to service the emerging FPSO markets in these regions.
Extended Heating Surfaces
Harris Pye offers comprehensive design and manufacturing facilities for both plain tube and extended surface exhaust gas economiser assemblies. Extended surface configurations include single and double ‘H’ gilled, spiral wound and pin type tubes.

Helical Solid Fin
Helical solid fin tube is produced on state-of-the-art, high frequency spiral fin tube welding machines. Tube sizes range from 25 mm to 115 mm OD and can be found with a range of fin heights from 10-25 mm on varying pitches. This covers virtually all configurations found in marine service today.

‘H’ FIN
Pairs of parallel shaped steel fins are resistance welded to the single pressure tube surface under carefully controlled conditions. The purpose built welding machine ensures precision indexing along the entire length of the tube and exact parallel attachment.

Steel ‘H’ fin was introduced in the 1950s due to the requirement for reliability in dirty and potentially corrosive environments, specifically associated with waste heat units fitted to the uptakes of large diesel engines. With deteriorating fuel quality, this is particularly crucial to the marine industry.

The ‘H’ design reduces draft loss and allows straight-through flow of gas over the unit. Both of these factors facilitate a self-cleaning effect, which greatly reduces fouling and the potential for damaging and sometimes catastrophic soot fires. The compact design of these units can realise a 50% saving in space compared to plain tube designs. This is another important consideration in the ever increasing necessity for space and weight savings.

At Harris Pye we place the most stringent quality requirements on our products and services.

Our highly skilled and experienced engineers ensure that all stages of programming and works undertaken comply with all of the latest class and quality assurance regulations. Our services are guaranteed accordingly. Together with our promise of 24-7 worldwide service, this means our customers are confident that they can completely rely on Harris Pye in all situations.
**HP Economiser Range**

The ‘HP’ Economiser range is specifically designed to recover the waste heat in boiler exhaust gases, and to transfer as much energy as possible to the incoming boiler feed water stream by pre-heating the water before it enters the boiler. The design and construction of the HP Economiser lends itself to installation into most boiler exhaust gas outlet ducts. HP high efficiency tube banks are purpose-designed units, constructed from selected finned steel tubing, manufactured on Harris Pye’s own specialised, in-house ‘Spiral’ and ‘H’ type tube finning machines.

Installation of an HP Economiser provides many advantages:
- Reduced energy costs
- For each percentage point efficiency the system gains, an equivalent fuel saving is achieved, i.e. an increase in efficiency of 6% equates to a 6% saving in fuel costs
- Assists with meeting mandatory energy efficiency audit and reporting targets
- Designs are suitable for most fuels
- Less fuel burned results in lower emissions
- Lower CO2
- Lower NOX
- Lower particulates
- Provides the possibility of a carbon offset credit for some operators

HP Economisers are designed and constructed under strict Quality Assurance to meet the highest international standards. They can be comprised of standard carbon steel or high corrosion resistant materials allowing for the highest possible heat recovery with the longest life expectancy. This enables the continued minimisation of your energy costs.
Heat Exchangers and Condensers

Harris Pye offers a worldwide service for heat exchangers and condensers. We specialise in the repair and restoration of the following:

• Main condensers
• Auxiliary condensers
• Feed heaters
• Cargo heaters
• Jacket water coolers
• Oil coolers

We maintain large stocks of various sizes and grades of fully certified materials for immediate delivery:

• Copper alloys
• Carbon steels
• Inconel
• SMO
• Stainless steels
• Super duplex
• Titanium

**Re-tubing**

By deploying highly skilled teams of technicians around the world we can carry out total retubing of main and auxiliary condensers, feed heaters, cargo heaters, jacket water coolers and oil coolers.

**Tube Inserts**

We can restore many failed units to full working order, where the defect is known to be tube-end corrosion or erosion, by way of the tube insert method.

**Chemical and Mechanical Cleaning**

Our cleaning system utilises several methods, including Teflon coated jet brushes that are propelled through the tubes at high speeds using compressed air and water. In addition to this, we have several other types of cleaning methods available.

**Inspections**

Inspections, with the aid of three ball micrometres and full colour video optic equipment, are carried out by a team of technicians prior to repairs.
Skid Manufacture

Harris Pye has built a solid reputation for both engineering design and manufacture of various skid mounted equipment for offshore and onshore hydrocarbon recovery and treatment applications.

Pumping, cooling, water treatment, RO and steam injection for recovery are all applications where Harris Pye has supplied multiple clients with batches of skids. The Group has all the engineering disciplines in-house to complete the mechanical, electrical and instrumentation requirements of the skid.

The skids are manufactured in one of our many global facilities, depending on the client’s region of operation and if required they can be installed and commissioned.

Our experience in carbon, stainless and more exotic duplex materials means that all requirements can be met locally. This reduces the time needed to put the equipment to work for meeting production targets. Full materials and equipment selection is also available, and we will cooperate with specified sub suppliers if applicable.
Accommodation Outfitting, Galleys and Modules

Outfitting Capabilities
Harris Pye has gained a formidable reputation over the years for the design, manufacture and installation of a myriad of elements, which allows us to provide complete packages.

We create the right design solution tailored to the client’s needs and budgets.

From our specialist workshops, we can carry out all elements of the manufacturing process in-house, to the highest standards. Installations can be carried out by our skilled fitters during refits, new builds or whilst in service worldwide, via our mobile work squads.

Design
Operating both in marine and land based environments, our outfitting department offers bespoke design concept services to our clients, ensuring that the best solution is chosen to meet needs and budgets. Our in-house design team uses state-of-the-art, 360 degree scanning equipment and software to design minutely accurate solutions, and create stunning walkthrough 3D designs. This negates errors whilst ensuring fast turnaround.

We work with the client’s contractors, ship builders and managers to arrive at the most suitable layout, products and coverings.

Accommodation Modules
The modules offered by Harris Pye come in a range of sizes: 12.2m/40ft, 9.8m/32ft, 7.8m/26ft and 6.1m/20ft. Modules can be made to accommodate 1, 2, 4 or 8 men depending on the cabin layouts and number of bunks per cabin specified.

Our modules can be delivered with either A60 windows or A60 hatches. In addition, all modules are equipped with wet rooms in each cabin. Modules can also be H60 fire-rated if required, and are compliant with current SOLAS regulations.

The standard features of our modules include DNV (BS EN 12079) or ABS certification, HVAC system, A60 or H60 fire-rating, fire and gas detection system, sprinkler system, emergency lighting, full automatic shutdown (CPF G panels – optional), fire dampers, PA/TV/Tel sockets and connections. Modules can be adapted to suit a variety of needs including, but not limited to, galleys, recreation rooms, canteens, laundries, locker rooms and offices.

Accommodation modules can be utilised as either standalone units or linked and stacked together to form multi-purpose, multi-level accommodation complexes. Linking kits are waterproof, providing a watertight barrier, and are supplied with each module. The structures are designed to link together efficiently and thus minimise valuable installation time.

Manufacture and Installation
Our highly skilled and experienced outfitters ensure that all stages of programming and works undertaken comply with all the latest class and quality assurance regulations. Our services are guaranteed accordingly.

Many clients require turnkey packages, so it’s common for our department to work with other divisions within the Group on large projects. This greatly aids the planning and execution of extensive work scopes.

Installations are carried out both during vessel refits and whilst the ship is in service. The latter requires a riding squad of engineers and fabricators. We are well versed in this practice, with personnel on standby to travel at short notice and to work at sea for extended periods on scheduled projects.
Galleys and Bespoke Stainless Steel
We have vast experience of installing galley equipment on ships worldwide, and working to tight deadlines.

We design, manufacture and install state-of-the-art galleys.

These are completely built on our premises so that clients can view the installation prior to fitting. The emergence of Norovirus on cruise vessels has led to enhanced regulations for hygiene standards on ships. These particularly apply to the construction methods used to manufacture food preparation facilities. Both the United States Public Health (USPH) and United Kingdom Public Health (UKPH) agencies are placing great emphasis on these matters. All our marine installations comply stringently with both USPH and UKPH requirements.

Harris Pye also has an excellent track record in onshore projects – namely stainless steel pipework. Our teams offer complete solutions, from design and manufacture to installation, according to the client’s requirements. The team has completed extensive projects, including food preparation areas, galley equipment, beverage stations, galley troughs, washrooms, deck clearing stations, bars and pantries.
Marine and Offshore Refrigeration and HVAC
Refrigeration Provision Plant / Cold Rooms
Our highly qualified and experienced team offers a full design service, including insulated cold rooms for chill and deep freeze, and a repair service for all refrigeration equipment - compressors, condensers, evaporators, receivers, oil separators and more. We use state-of-the-art equipment and deal with all the leading manufacturers, such as Carrier, York, Bitzer and Sabroe Daikin.

Our team can also retrofit refrigerants to conform with the latest legal (flag state) requirements.

Air Conditioning Systems
We offer full design of new systems or repair / upgrade of existing systems, including all refrigeration equipment, AHUs (air handling units), ductwork, fire dampers, air outlets, insulation (thermal and fire), and full electrical and automatic controls, all of which fully conform to classification requirements.

We offer turnkey chilled water design, supply and installation packages.

We also offer packaged air conditioning units for engine control rooms, cargo control rooms and smaller workshop areas, with a full range of explosion-proof, zone-rated equipment.

Cargo Systems
In addition to the above, we offer servicing, repair and overhaul for classification requirements for cooling (primary) for L.P.G. cargo systems and inert gas cooling systems, along with all refrigerated cargo plants.

HVAC Ductwork
Our experienced teams offer full design, manufacture and installation of HVAC ductwork.

Our system offers excellent thermal and acoustic performance in a fire-safe system, providing an economical and efficient solution.
We offer pre-insulated spiral wound ductwork as well as bespoke ductwork all of which are manufactured in accordance with the latest ASHRAE guidelines, SOLAS Regulations and DW144 specification.

We offer a system which excels in terms of thermal performance producing significant energy savings whilst remaining durable and suitable for all acoustic applications with superior sound attenuation.

**Furniture and Furnishings**

All furniture can be bespoke designed and made to measure:
- **Steel** – available in a wide variety of RAL colours
- **Laminate** – available in many styles and varieties, including ‘new wood’ style laminate finishes
- **Upholstery and curtains** – wide selection of fabrics and leathers; all IMO approved
- **Flooring** – all styles of laminate, hard flooring, carpets and vinyl supplied and fitted, including ‘Amtico’ style flooring
- **Joinery**
- **French polishing**

We can offer expert assistance and advice on the design and installation of marine fire divisions. The Group offers access to an extensive knowledge database on insulation issues associated with critical areas such as engine rooms, vehicle decks, bulkheads, deckheads and penetrations.

Our insulation division can provide whole life vessel support and maintenance arrangements for fire divisions. This includes the supply and installation of other fire boundary devices such as doors, dampers and penetrations, profile wrap fire divisions, modular panel systems and high temperature exhaust system insulation, in compliance with classification society requirements.

Our team has extensive experience within conventional marine and high-speed craft industry.

We have developed insulation solutions for structural fire protection to meet stringent International Maritime Organisation, commercial and military standards.

**Electrical**

Our extensive team of skilled electricians and technicians hold the ability to offer full design, procurement and installation of all electrical works including:
- Small power and lighting systems
- Fire and gas detection systems
- Variable speed drives (ventilation)

We can provide and install new galley supplies, as per client specifications and requirements, as well as design and install distribution boards.

Our services allow for integration into existing systems including PA/GA and IT. Our projects are completed in accordance with all statutory and regulatory requirements. This is supported by a complete set of test and commissioning documentation which is provided to the client.

**Plumbing and Pipefitting**

Harris Pye has a solution for all types of pipe installations. Our design team can tackle any problem from new build to retrofit. We build off-site from latest laser scan technology and our experienced engineers are fully conversant in all types of plumbing and pipe fitting to the highest standards. Harris Pye mobilise riding crews globally 24/7 to all marine and offshore projects whether it be from plumbing in a wet unit to high pressure pipe installations.

Our engineers have been trained in all types of installation for standard marine and offshore installations as well as materials including carbon steel, copper, cupronickel, stainless steel and UPVC, be it sanitary to fresh water, chilled water and refrigerant grade copper.

Specialist materials include:
- Instaflex Fusion welded UPVC
- Loro – black and grey water pipework
- Refrigerant grade copper
- High pressure pipework and gas lines
- Mapres – stainless steel seamless pipe
Europe
Harris Pye United Kingdom Ltd
Hangars 5 & 6
Bona Road, Llandow Trading Estate
Near Cowbridge, Vale of Glamorgan
CF71 7PB
Tel: + 44 1446 720066
Fax: + 44 1446 720801
E-Mail: hpuk@harrispye.com

Middle East
Harris Pye DMCC
PO Box 127969
12th Floor Mazaya BB-1
Jumeirah Lakes Towers
Dubai, United Arab Emirates
Tel: + 971 4324 1535
Fax: + 971 4324 3585
E-Mail: hpoffshore@harrispye.com

Asia
Harris Pye Singapore Pte Ltd
31 International Business Park
#04-03A
Singapore 609921
Tel: + 65 6863 3188
Fax: + 65 6863 3166
E-Mail: enquiries.singapore@harrispye.com

South America
Harris Pye Brasil Ltda
Rua Academico Paulo
Sérgio Carvalho de Vasconcelos
N.º 780,
Novo Cavaleiros
Macae – RJ – Brasil –
Postal code / CEP: 27930-260
Tel: + 55 22 2765 9950
Fax: + 55 22 2765 9967
E-Mail: harrispyebrasil@harrispye.com

North America
Keppel Marine Agencies
5177 Richmond Avenue
Suite 1065
Houston, Texas
77056
USA
Tel: + 1 713 600 8371
Fax: + 1 713 600 8374
E-Mail: john.bajor@kmaihouston.com

Australia
Harris Pye Australia Pty Ltd
10/11-13 Brookhollow Avenue,
Baulkham Hills
NSW 2153
Australia
Tel: + 61 02 9894 2655
Fax: + 61 02 9634 8811
E-Mail: enquiries.australia@harrispye.com

www.harrispye.com