

Drive & Control profile

Technical Article

Key considerations for offshore and marine service programs



Comprehensive offshore service programs should take a complete life cycle approach, and include options for field service, preventive maintenance, spare parts programs, equipment overhauls and retrofit/modernization options.

Maintenance and service programs are vital to the success and competitive performance of many different sectors of the marine and offshore industry. Because the choice of the correct service strategy and service partner can significantly affect the economic success (or failure) of an offshore operation, there are several key factors to consider when developing an offshore operation's service strategy.

The best approach balances the safety and protection of people and equipment in a harsh and

unforgiving environment, against the need to sustain levels of uptime and equipment utilization based upon industry requirements and market conditions. This is particularly important when applied to the hydraulic technology that plays a crucial role in the operation of offshore industrial platforms and work vessels.

For many companies with long-term offshore investments that reach into the billions, the most effective servicing solution has been to

Key insights & considerations:

- Offshore service programs preserve and extend the operational life of valuable technology like hydraulics systems
- Harsh offshore operating environments, as well as distance from shore repair facilities, add unique challenges to standard industrial service programs
- Investing in preventive maintenance and scheduled overhauls is more economical than purchasing new or replacement equipment, even during downturns in cyclical businesses
- Service providers should be selected based on their expertise with the equipment being serviced, such as the OEM
- Rig-certified field technicians and multiple regional repair facilities provide more reliable solution for comprehensive service programs

undertake a comprehensive lifecycle approach. They choose a service provider with deep technical expertise and an established network of regional service centers staffed with expert technicians and service planners to leverage the highest return from their equipment investments.

Changing conditions in offshore industrial activity

In many regions of the world, the dominant offshore industrial activity is in petroleum and natural gas development and production; other key areas of activity include deep sea mining, offshore wind energy and tidal power installations and undersea scientific research.

Until recently, many offshore regions were experiencing extensive growth and investment in fossil fuels exploration and production platforms. However, this industry is highly cyclical, and when global demand drops or new supply sources come on-line, significant contraction can occur.

Under these market conditions, there is a tendency to idle equipment, slash budgets across the board, delay crucial maintenance and postpone lifecycle service activities until economics improve.

It is important for companies with a long-term commitment to the offshore industry to also take a long-term view of their investments in service programs for their equipment.

In fact, when demand for boats, offshore rigs and other equipment is reduced, it may be a perfect time to invest in equipment overhauls and completion of long-term maintenance projects. When the cycle turns and demand resumes, equipment will be



The complex array of hydraulic technology used throughout offshore industrial operations such as oil and gas production platforms requires comprehensive service programs with expert personnel and well-designed processes.

fully overhauled and ready to deliver the highest levels of uptime.

Offshore systems: Complex applications and hydraulics technology

Offshore platforms and work vessels use some of the most sophisticated—and rugged—hydraulics to serve a broad range of applications.

Hydraulics are crucial technologies and include equipment such as:

- Deck equipment such as cranes, winches, tensioner systems and ROV launching/control equipment
- Jacking and deck mating systems
- General hydraulic equipment such as power packs, control blocks, hydraulic circuits with pumps, motors and valves
- Drilling equipment such as top drives, mud drives, rotary tables and hoist cylinders
- Skidding and fixation systems
- Heave compensation systems
- Large hydraulic cylinders

These complex industrial systems incorporate multiple hydraulic technologies. They are typically large-scale, highly engineered systems designed primarily to move, lift and lower massive loads—from shore to vessel, from vessel to working rig or from the surface to subsea work sites.

Many incorporate state-of-the-art electrohydraulic controls to deliver the combination of high power density, precision control and operational reliability that is the hallmark of the latest industrial hydraulic systems. They represent a significant capital investment, so a cost-effective, long-term plan for sustaining operational life and uptime is crucial for maximizing the return on those investments.

Challenges of service programs for the offshore industry

Service programs for the offshore industry present several key



To ensure that on-site repair and maintenance projects are conducted safely and efficiently, rig-certified service technicians and programs designed especially for offshore service are important considerations.

challenges. As with other industries' service programs—especially those in highly cyclical industries—there is a constant need to structure and deliver service with maximum efficiency and cost-effectiveness.

For segments of the offshore industry where cost-cutting is underway, this calls for creating service schedules

and providing service program options that can be clearly cost-justified against immediate operating budget constraints and can demonstrate long-term value from investing in maintenance projects during idle equipment time.

Equipment availability and uptime remains a key driver for installations

and vessels still operating. Hydraulics technology drives some of the most costly and heavily utilized technology on workboats and multi-billion dollar offshore platforms—if this technology is down, the entire vessel or platform is wasting tens, even hundreds, of thousands of dollars waiting for repair.

Work vessels undergo periodic reclassification surveys, including detailed five-year surveys to document that the vessel is being operated and maintained according to regulations. It is common for ship owners to conduct full fixed price repairs and overhauls of ship equipment at these five-year milestones, often with original equipment manufacturers (OEMs) supplying the service work with warranties that bring equipment back to “as-new” operating conditions.

One factor that affects the dynamics of servicing the offshore industry's equipment is the distance from the shore. Industrial, workshop and repair resources on land can be hours, even days, away from the platforms. Also, limited space on offshore platforms and workboats makes stocking spare parts extremely difficult.

There is also the challenge of finding and retaining skilled, well-trained technicians. Many large-scale offshore companies have operations working out of multiple ports and offshore locations in a given region, such as the North Sea, and may depend on convenient local service operations as opposed to rig-certified technical staff.

This situation creates the potential that standards of service—response time, technical capabilities, spare parts and equipment—will vary by location, as well as costs. Consistent,

high levels of service, repair and maintenance capabilities, as well as sufficient rig-certified staff availability, can limit a given shop's ability to perform the effective repair work within necessary time frames.

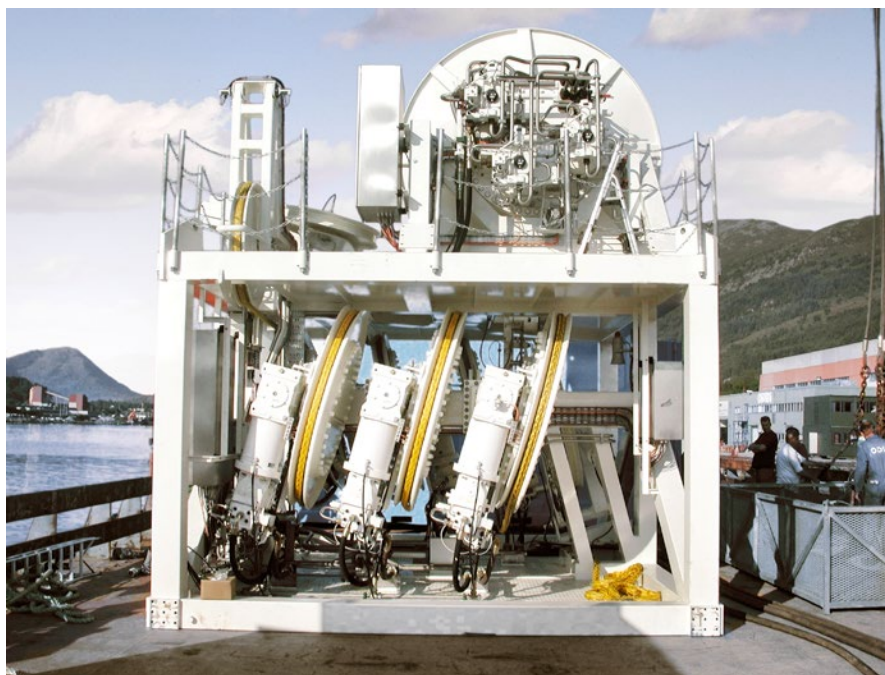
Risk factor: Fragmented service strategies

Combined with highly cyclical business conditions, there is a strong risk of fragmenting service work on offshore equipment and approaching it in a piecemeal fashion: Scheduling work only when absolutely necessary, and postponing critical preventive maintenance, overhaul and remanufacturing work until business conditions improve or technical resources become available.

However, the most successful offshore and maritime operations treat service as a strategic priority. They recognize that it is just as crucial to invest in the best service and support solution as it is to invest in the best equipment in the first place. They seek solutions implemented across multiple locations, treated as a strategic priority and integrated into overall planning.

A life cycle approach utilizes a suite of services covering all major requirements from a single source provider. The optimum solution is a multi-site program that offers multiple types and levels of service, with options for unique needs. This comprehensive approach—of time, personnel, operational planning and funds—allows a maritime or offshore operation to establish and sustain service levels across the board.

Many companies are choosing the hydraulics OEM as their single source provider. The risks and potential costs



Servicing many offshore systems, such as this active heave compensation system, requires deep technical expertise for effective maintenance and repair; often, the best source for this work is provided by the OEM.

of equipment failure that are the result of poor repair or overhaul work (failures which can sometimes occur weeks or months after the work is done) provide sufficient incentive for companies to contract experienced, warranted service work by the OEM.

Key life cycle service requirements

Organizations that supply life cycle services for offshore and maritime operations need to have extensive capabilities. To be able to deliver consistent service levels across a region, it is preferable if they have a broad number of service locations within a given offshore area of operations (i.e., North Sea, Gulf of Mexico, etc.).

Life cycle service providers should offer a complete suite of service programs that incorporate options and features designed to satisfy the unique service requirements of

the offshore industry, rather than a more general industrial maintenance program adapted to offshore needs.

Selecting the right service provider/partner depends, at least in part, on how they define “life cycle services”—and the scope and resources they offer within their suite of services. They should cover all major potential needs, yet be flexible enough to enable customization for individual businesses, locations and technical requirements.

Effective spare parts supply and delivery programs should include:

- Genuine manufacturers parts, rather than substitutes or replacements, to ensure the integrity and long operating life of complex hydraulic equipment
- Well-maintained inventories based on historic demand and insight into

equipment components that undergo significant levels of wear and tear

- Dedicated spare parts kits, located either on offshore platforms (if space permits) or at the nearest onshore service location
- Complete spare parts management agreements, specifying which components are available, delivery time frames and methods per location (with backup via special electronic online spare parts catalogs)

Emergency repair services

should feature:

- Location-specific agreements defining equipment covered, technicians required to handle repairs and time frames for accomplishing repairs or installing backup equipment
- Fixed price repairs with a service agreement contract that details scope of work, spare equipment stocks and performance levels
- Processes for root cause failure analysis and recommendations for improving use or implementing preventive maintenance programs

Preventive and failure predictive services

provide a crucial resource focused on preventing equipment failure and downtime. Today's leading-edge service organizations are able to offer:

- Multi-year programs to ensure continuity of service. For example, for continuous jack-up systems for offshore programs, a five-year program to maximize uptime during operational life would include a preventive maintenance program for years one and two, a schedule of expert inspections and maintenance advice for years three and four and a scheduled repair and overhaul during docking in year five.

- Computer-driven predictive maintenance services—computer modelling tools can calculate the machine health state of key equipment components, such as large hydraulic cylinders, incorporating performance data from monitoring equipment.

This enables the life cycle services provider to recommend condition-based maintenance and preventive repair services or modifications to equipment usage, helping reduce risks associated with unplanned downtime and enabling management to more accurately plan and budget equipment servicing activities.

Field services, including repair, maintenance and inspection, need to be built on the right resources—in terms of both personnel and service delivery approach:

- Rig-certified technicians in all service locations

- Technicians should be specialists trained in all aspect of hydraulic drive & control technology on-site
- Established, competitive time frames and schedules for delivering personnel to offshore locations (via boat or helicopter); these need to take into consideration seasonal conditions and the time-sensitive nature of specific equipment
- Technicians should have the proven ability to properly and safely plan maintenance and repair tasks, defining steps for shutting down, removing, repairing and re-installing equipment on-site following standard, well-established procedures to protect all onboard

Retrofit and modernization programs

provide the most cost-effective way to sustain long-term ROI for offshore systems, even during the downturns in cyclical markets. By incorporating these programs into a life cycle service program, offshore



Life cycle services for offshore technology can also include onshore equipment overhaul programs using factory certified parts and utilizing OEM-trained technicians to extend the operational life of hydraulic and electrohydraulic components and systems.

and maritime systems operators are able to:

- Integrate replacements with remanufactured components from the OEM into the long-term service program
- Lower total cost of ownership and save on resources by using or remanufacturing components
- Ensure highest levels of equipment availability including automatic renewal/extension of equipment warranty
- Maintain the integrity of offshore and shipboard systems by utilizing the same equipment, with the same specifications, as when the systems were originally installed
- Adjust retrofit and modernization programs for different types of equipment, from smaller pumps and motors up to complete, in-factory overhaul of large-scale systems such as heave compensation, deck winch systems and large hydraulic cylinders

Core recommendation: Count on offshore technology experts

In many cases, the service programs offered by OEMs offer significant advantages, because they have been created by drawing on their deep experience designing, manufacturing, installing and supporting these hydraulic technologies.

They are companies with established service programs designed to have work centers and other resources across a broad geographic reach, so that work can be accomplished quickly and hands-on working knowledge of existing installations can be developed.

They typically make available comprehensive service offerings that cover all major aspects of service under one service contract, so that one provider can satisfy as many needs, as is required.

They will be staffed with expert service personnel continually trained on latest techniques and system requirements, so work onshore and offshore proceeds with highest levels of both efficiency and quality for equipment being serviced.

And they will be knowledgeable about the effective performance lifetime of offshore equipment—when to consider replacement or retrofit/modernization of components, based on knowledge only the OEM truly understands.

Offshore and maritime industrial operations are highly cyclical and environmentally demanding, and are dependent on having hydraulics technology that delivers long-term value. Implementing and sustaining effective and comprehensive life cycle services programs is one certain way to ensure that value is delivered.

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