

MARINE CHALLENGES AND OPPORTUNITIES IN NEWLY EMERGING MARKETS AND SECTORS

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Abstract: Submarine cable systems are being deployed in new geographic regions and in new technology sectors, away from what may be considered “traditional” telecom systems areas. These new opportunities are allowing the industry to expand and grow; but there are new challenges that must be understood, addressed and managed. This paper will review the differences and challenges associated with the newly emerging markets and sectors from technical, commercial, geographical, and demographic points of view, and will review how the risks associated with these differences are assessed and managed so that projects are planned and delivered safely and successfully.

1 INTRODUCTION

The telecommunications industry suffered a sharp, dot-com type recession during the early years of the 21st century which drove the disappearance of plans and profits, forcing some companies to flounder and some to go out of business, while others survived and emerged into a post-recession climate of new challenges and opportunities. Companies that had supplied the submarine telecommunication industry for decades and that had depended on a reliable and traditional source of revenue discovered that historical revenue streams were drying up, previous alliances were becoming weaker as everyone struggled to survive, and their very livelihood and existence was under threat.

In order to survive into the 21st century, new markets and customers had to be found, and quickly. Telecommunications suppliers, from large turn-key to smaller subcontractors, emerged from three hard years of recession into an altered market place that includes new as well as traditional customers, unfamiliar geographical horizons and the necessity to adapt to new product requirements.

This paper will look at this brave, new world and will discuss the differences between the existing “traditional” market and the new, emerging market and will evaluate the move away from the comfort zone in terms of risk and challenge.

These issues will be discussed in four distinct sections:-

- Background
- Operational and Technical
- Geographical and Demographic
- Commercial

2 BACKGROUND

2.1 The Telecommunications Recession

The suddenness and severity of the recession that hit the telecommunications industry in 2002 took everyone by surprise. Companies that supplied the industry, such as system suppliers, cable manufacturers, and ship operators underwent a swift period of change. Some closed, some were sold and some endured the years 2003 to 2006 by adopting the following strategy :-

- survival mode management
- near zero investment
- facility closures
- ship disposal
- multiple lay-offs
- investigation into new markets and new revenue streams

These measures, adopted throughout the industry, ensured the survival of the majority of supply companies in the immediate aftermath of the downturn, albeit in a reduced size and capacity. The immediacy of basic survival and a then new strategy was required to ensure long term survivability, which is described below.

2.2 The Revival Strategy

The new, slimmed down, lower cost, and arguably more efficient supply industry that emerged, did so into a telecommunications market still in recession. A long term strategy was required to ensure survivability into the 21st century, which included:-

- maintaining existing supply contracts in the Telecommunications Industry, at lower costs and improved efficiencies
- entry into the newly emerging offshore renewable energy (wind farms) market

- entry into the revitalised offshore fossil fuel (oil and gas) market
- entry into newly emerging offshore scientific market
- recovery and relay / disposal of out-of-use cables
- development of new geographical markets for submarine telecommunication systems.

The challenge of this new strategy was to adopt the changes necessary to be successful.

3 OPERATIONAL AND TECHNICAL CHALLENGES

The key to success and long term survivability lay in identifying and managing the operational and technical challenges required in the new post-recession era. These challenges involved change, change in the method of supply to existing customers and change in the approach to new customers in new market sectors. All the major telecommunication suppliers now undertake work in new sectors, and all undertake work in the offshore oil and gas sectors. There are challenges to working in offshore oil and gas or power fields as outlined below:-

3.1 Health, Safety and Environment

The submarine telecommunications industry, like all industries, strives both to reduce work-related accidents and to reduce the impact on the environment, and therefore adheres to national HSE regulations and recommendations such as those regulated by the UK Health and Safety Executive (HSE), US Occupational Safety and Health Association (OSHA) and other national HSE offices. These bodies are charged with governmental responsibility to provide legislation, enforcement, and guidance.

The telecommunications industry holds a good safety record; however, the risks associated with installing cables and working in the oil and gas environment are greater than those associated with installing cables in the traditional telecommunications environment.

The telecommunications and offshore industries share obvious common risks such as living and working on board ship, cable loading and laying operations, handling loads under tension etc., but there are additional risks and hazards associated specifically with the oil and gas industry as given in the examples below:-

- Installation of telecommunications cables involves a close, self-contained and invariably in-house team, whereas work in the offshore environment usually involves working with multiple subcontractors on site, and even onboard the installation ship, at the same time. These may include divers in saturation mode, touch-down monitoring ROV teams, concrete

mattress teams etc. where co-ordination and safety management become more demanding and complex;

- Shore end site work for telecommunication cables is invariably undertaken on open beaches, whereas shore end work for oil and gas cables is undertaken inside the pipeline corridor, and may well be close to, or inside, an oil terminal itself. The hazards of working close to oil and gas installations are proportionately higher and require more exacting standards of safety;
- Operations in close proximity to oil platforms and subsea oil installations such as pipelines, wellheads and manifolds carries the risk of damage to oil or gas filled installations with associated increased environmental hazards.

The increased risks when working in the offshore environment are recognised by the fact that a number of additional safety associations have been formed:-

- The UK HSE Offshore Division has been specially formed to address the offshore oil and gas industry;
- The International Maritime Contractors Association (IMCA) which aims to achieve self regulation amongst contractors working in the sector on a world-wide basis;
- The UK Offshore Contractors Association (OCA) which represents the oil and gas contracting industry in the UK;
- The British Rig Owners Association which is committed to a “step change in Safety Initiative”;
- The US American Pipelines Contractors Association (APCA) which addresses safety, environmental and security issues within the pipeline industry;
- The “SafeGulf” Process has been introduced in the Gulf of Mexico. BP, Chevron, Shell and ExxonMobil have been actively involved over the last several years in the development of consistent, minimum health, safety and the environment (HSE) training requirements for the contractor community;
- Individual companies, such as those oil majors mentioned above, have their own safety procedures in addition to the HSE and OSHA requirements that all subcontractors must follow. These may include Behavioural Based Safety Programmes, Driving Safety Procedures, Short Service or Temporary Employees Safety, Additional Specified Training, Subcontractor Management etc. All subcontractors are subject to additional safety audits to ensure compliance.

In addition, these safety associations self regulate the offshore industry by introducing codes of practice and the formation of sub-groups to address the various component parts of the work site:-

- Overall safety;
- Training, certification and competence;
- Diving operations;
- Marine / vessel operations;
- Survey operations;
- ROV operations.

3.2 Quality Assurance and Project Management

The majority of telecommunications suppliers operate on a voluntary basis to ISO 9001-2000 (Quality Assurance) and ISO 14000 (Environmental) or equivalent international standards. This compliance ensures a high quality product and service which has proved sufficient for the demands of the traditional telecommunications industry.

The oil and gas industry, where damage to oil filled installations poses a much greater environmental threat than damage to a telecommunications cable, has suffered a number of major accidents in recent years which have resulted in large loss of life as well as extensive environmental disasters. The industry is, therefore, continually improving its quality control and project management and increasing the resource and time dedicated to this area. A huge effort is undertaken and a great deal of attention is paid to quality assurance and project management in order to reduce, not just the potential of accidents, but the accidents themselves. This involves and requires a much larger time and personnel resource than is customary in the telecommunications industry.

The specific risks associated with offshore oil and gas industry typically demands the following measures:-

- Quality and Environmental certifications and accreditations are obligatory and their absence would make the opportunity of undertaking work minimal;
- All subcontractors, without exception are to be duly accredited; in the case where smaller subcontractors are not accredited, they would be subject to audit;
- Project Management, monitoring and reporting procedures and processes are specified to a higher level of detail than is customary in the traditional telecommunications industry;
- Documentation requirements are greater during all phases of the project and require a larger time and personnel resource than is customary in the traditional telecommunications industry.

3.3 Product Development

The telecommunications industry utilises the highest technology equipment both in and out of the water to provide high speed and high capacity telecommunications over long and short distances. It is

a highly sophisticated industry with well established and proven product lines.

However, the offshore markets do not necessarily require such high speed or high capacity communications and have different and new product requirements which must be developed and supplied, often with associated research and development costs. The amount of product development required will obviously vary from project to project, but the following examples are indicative of the challenges faced by new entrants into the offshore industry, including offshore wind-farms as well as the oil and gas installations:-

- Safety is the single most critical factor on an oil platform with electrical integrity under all operating states being a high priority. Transmission equipment, primary and back-up power supplies, switches, joints, connectors and all associated gear must be designed to operate without any possibility of producing sparks or electrical discharge. In addition, testing, calibration and certification of all operating and support equipment is at the highest level requiring an attention to detail and investment in time that must be considered before undertaking projects on offshore platforms;
- Weight and space is probably the second most important aspect of platform based equipment and telecommunications equipment may have to be re-designed or configured before being acceptable offshore, with the addition that the space allocated to a piece of transmission equipment may not be ideal and may be a far cry from the stable conditions of a traditional telecommunications Cable Station;
- The earliest offshore platforms were relatively close to shore and in shallow water where the vertical rise from the seabed to the topside of the platform was 20 metres or less, these platforms were constructed on the seabed, presenting no problem to cable and fibre integrity. Fields have developed over the past twenty years so that the water depths now range from the very shallow, such as 20 metres in West Africa, through medium depths of between 40 and 200 metres such as in the North Sea, to deep wells over 1000 metres in the Gulf of Mexico. The trend is to recover oil and gas from further offshore in deeper waters using floating platforms where the vertical rise from seabed to platform will be significant. It is not certain that these very deep wells and platforms will require telecommunication cables, but it is probable that cables will be required at greater depths in the future. These depths will be served by floating platforms where the dynamic state of the platform may require new products. These products are not found in traditional telecommunication systems and is another example of the product development requirements of entering into a new market;

- The trend in platform operation is to reduce offshore personnel requirements by transmitting relevant data onshore via submarine telecommunication links for processing and decision, thus making system integrity and restoration a priority. Self healing ring configurations are becoming standard in the offshore industry just as in the telecommunications industry, however, in some cases the requirements of installing a trunk network with seabed Branching Units with multiple ports may require new product development to reflect the specific requirements in oil fields.

3.4 Offshore Site Work

The installation of traditional telecommunications cables involves laying a cable along a single route between two distinct, separate locations, often many thousands of kilometres apart. The work normally includes a number of stand-alone operations such as route clearance, pre lay grapnel runs, cable ship installation and post lay burial which are undertaken sequentially. Work in offshore zones, wind farm as well as oil and gas fields, invariably involves a number of operations and tasks undertaken concurrently, resulting in coordination and scheduling restrictions that may cause delays or even lack of available resources. Examples of additional tasks and challenges are as follows:-

- Offshore wind farm sites in particular are congested areas with numerous, short inter-turbine power cables linking via seabed connectors to the trunk cable back to the shore. The largest wind farm recently announced is off the coast of Texas where 100 turbines are planned to be erected in a 12 kilometre square box, which equates to one turbine approximately every kilometre. The marine operations of such a field will include multiple contractors, not exclusively cable installation contractors, attempting to schedule operations into good weather windows which are, by definition, narrow in wind farm sites. In the past, this has proved to be a challenge to the cable installation operations, resulting in time delays and cost overruns;
- Oil and gas fields are also congested areas when subsea wells, manifolds, pipelines, umbilicals are considered in addition to power and communication cables. The areas close to the platforms and platform approaches within 500 metres are particularly congested where routes have to be followed to a high degree of accuracy. In these areas, and at crossing points, cables as well as pipelines, touch down monitoring by ROV is required, and cable may have to be recovered and re-laid until the exact bottom placement has been achieved. Oil field construction vessels are designed to operate two ROVs or a plough and an ROV concurrently, however, traditional cable vessels are not capable of this and additional support vessels may have to be chartered;
- Positioning specifications for all vessels operating inside offshore fields are high and typically require all vessels to be dynamic positioning vessels with a minimum of DP2 classification. This includes route clearance vessels, mattresses vessels etc.

4 GEOGRAPHICAL AND DEMOGRAPHIC CHALLENGES

4.1 Unfamiliar countries

Telecommunication cable installation over the decades has followed economic and industrial growth patterns and has been concentrated in developed economies such as those found in the American, Asian, Australian, European and Middle Eastern regions. Supply chains are established in these areas where the required skill and experience base is well developed. Economic growth is now expanding to other regions of the world, which is resulting in a demand for submarine telecommunication cables where experience is minimal and where the specific supply chains are not developed. This presents challenges to all phases of a project as outlined below:-

- In traditional areas the component parts of a system are normally well established, such as backhaul routes, cable station sites, Out Side Plant (OSP), Beach Manholes (BMH), permitting requirements, shore end requirements, environmental and fishing hazards etc., but in new and unfamiliar countries these parameters are unexplored. As a result of this gap in information, for initial projects, the project feasibility and costing studies can prove difficult, price expectations may be unrealistic and project implementation could be problematical throughout the lifecycle of the project extending into after-sales service and maintenance.
- Operational and technical requirements in existing, traditional areas vary significantly, with some areas known to require long, deep buried and costly shore end landings whilst other areas have simple, short and inexpensive landings. Some cables are laid through areas of strong currents or mobile sandwaves or heavy fishing or heavy shipping traffic. Some terrestrial routes require urban installation, some rural and some totally green field. Some environmental and permit requirements are restrictive and others liberal. In general, however, despite the greatly varying requirements, in traditional areas these are understood, the solutions and costs established and surprises minimised. In unfamiliar territory the same large variations in requirements exist, but the scope and understanding is unknown, which presents the new entrant with a dilemma of how to proceed with feasibility, costing and implementation. Entry into these areas needs to be undertaken with careful attention paid to these unknown factors.

- Telecommunication system projects are complex management exercises that rely on the trouble-free entry, exit and in-country travel of appropriate personnel at relevant times, shipment of equipment in and out of country, liaison and co-working with local authorities, suppliers and agents etc. Difficulties in managing and executing projects may be complex, involving high-level foreign embassy assistance to a simple problem with language and translation, domestic living procedures or visa restrictions. These processes are understood in traditional areas, but in new countries and continents these are not well established and must be appreciated when entering these new markets.

4.2 Distance from base support

Multi-million dollar telecommunication projects involve complex delivery, installation and testing phases that are planned down to the smallest detail; however, problems still tend to occur that require solving, normally on site, but occasionally requiring the support of the base depot. Immediate support is sometimes required that relies on a fast and reliable communication, transport and travel infrastructure which can normally be relied upon in traditional operational areas, but which may not be readily available in new countries. A minor problem that can be solved quickly and effortlessly in a well known and established site, may well escalate rapidly into a major issue in a new area.

4.3 Personal Safety and Security

Personal safety and security is of the utmost importance for all projects and different risks face site and offshore personnel in different parts of the world. Risk management is based on a thorough understanding of the threat to be faced, which is normally the case in countries and areas regularly worked; however, threats in new countries can take some researching and appropriate counter-measures may be difficult to instigate. The following lists some of the personal safety and security hazards that may be encountered in new countries:-

- Piracy offshore
- Unexploded ordnance/ammunition onshore and close inshore
- Robbery
- Violence
- Infectious disease

These risks may exist to a lesser or even greater extent in traditional countries, but the difference in new countries is that these risks are not understood to such an extent.

5 COMMERCIAL CHALLENGES

5.1 New Customers and Suppliers

In general, following many years of contracting, commercial and contractual understanding between traditional telecommunications customers and suppliers have become well established so that contract negotiations are, to a greater or lesser extent, confined to discussions over the finer details of the project. The bulk of the contractual terms and conditions have become standard throughout the industry conforming to the requirements of both contracting parties.

In the non traditional markets such as the offshore market and in new geographical areas, customers and suppliers are new to each other and the contracting process may well be a longer and more arduous process. Each party may have to explain processes and conditions normally taken as granted in their own traditional area of expertise and allocate more time and resource to completing a, normally, routine contractual negotiation.

5.2 Financial

There are a number of unknowns in the financial aspects of undertaking projects in new markets and areas which will require investigation, these include:-

- Local taxes and official payments which may be difficult to ascertain before money or payment becomes due. In particular this would include withholding taxes that vary from country to country and which can be significant.
- Differences in currency and fluctuation in exchange rates combined with unknown rates of inflation in some countries can have a significant effect on cost, which is not often the case in countries belonging to an established exchange rate mechanism.
- The enforcement of Territorial Waters and Economic Exclusion Zones (EEZ) can also be arbitrary at times, especially in areas of disputed borders, and this can have an effect on the taxes and customs dues referred to above, or to the granting of permits and licences.
- The financial security of customers and suppliers also needs to be checked to avoid either being in the position of non-payment, or having critical goods or services fail, either case placing the viability of the project in doubt.

6 CONCLUSIONS

• The narrative in this paper has looked at the way the telecommunication industry reacted to the recession of 2002 and outlined the challenges involved in developing new post-recession strategies. The following conclusions can be drawn:-

- The recession of 2002-2006 resulted in a leaner more efficient telecommunications supply industry better

suited to the challenges and opportunities of the 21st century;

- The telecommunications industry, an industry which to an outsider appeared conservative and reactionary, reacted with high speed and commitment to meet its challenges;
- Diversity into new market sectors, such as the offshore market, and into new geographical areas appears to have been the key to the success of the industry revival, although this is not yet proven;
- There are numerous challenges to be overcome in entering the revival phase and the key to success is

knowledge and understanding of the problems to be faced and overcome;

- Long standing and traditional markets are likely continue into the future and should remain the cornerstone of the industry;
- It appears that the new markets are important to the near term viability of the industry but it remains to be determined whether these new markets and sectors will continue into the longer term.