3. OFFSHORE OIL AND GAS INDUSTRIES

3.1 The Market in the Offshore Oil and Gas Industries

The development of the offshore oil and gas industries in Europe's North Sea has done to ocean technology what World War II did to the aerospace technologies. It has provided the spur to enable a range of innovation to be introduced much faster than was thought possible 25 years ago when only shallow-water (less than 50 m depth) sites were developed for production. At first sight, the technologies now appear to be maturing but a relentless drive for cost savings is changing the requirements for technologies and also allowing new entrants into the marketplace, if they can meet more demanding requirements.

In practice, the distribution of annual total expenditure on offshore oil and gas industries within the E.C. countries varies, with the U.K. dominating the totals:

Table 1

Distribution of Annual Total Expenditure on Offshore Oil and Gas Industries

	1990 $ M	%
Denmark	460	3.6
Germany	550	4.4
Italy	590	4.7
The Netherlands	610	4.8
U.K.	10,300	81.7
Others (mostly Ireland and Spain)	100	0.8
Total	**12,610**	**100.0**

The possible entry of Norway into the E.C. before the end of the century will change the balance somewhat, with the U.K. still accounting for more than half the European expenditures on offshore oil and gas.

In the U.K., construction expenditures were $5.9 billion, 30 percent higher than the previous year. As newer fields have come on stream, the unit cost of a barrel of oil landed in the U.K. has dropped from $15 in 1989 to $12, with incremental projects and Southern Basin activities costing $10 per barrel in 1990. Gross capital investment in the U.K. was almost $6 billion. This is 16 percent of total U.K. industrial investment and is the same in real terms as the peak investment year of 1985.

In 1990, U.K. companies were awarded 77 percent of the $10.5 billion worth in new projects in the U.K. sector. This compared with 81 percent of 1989 awards, but represents a 49-percent increase in volume, indicating that U.K. suppliers are approaching full capacity. Similarly, exploration activities have increased by 27 percent, reaching $2.5 billion. Unit drilling costs appear to be of similar value, with 224 wells drilled (159 exploration, 65 appraisal). This compared with the previous record of 190 wells in 1984. In 1990, proven and probable reserves of oil increased by 90 million tonnes (675 million barrels) which, after deducting production of 180 million tonnes, means reserves of oil have fallen slightly. Similarly, gas reserves increased from 65 billion m^3 to 1,960 billion m^3.

3.2 Technology for Offshore Oil and Gas Industries

Since the massive deep-water fixed platforms for the big oil fields in the late 1970s and early 1980s, the industry has sought to reduce costs by minimizing the requirements for fixed platforms and substituting either independent floating production platforms, often associated with offshore tanker loading buoys, or subsea production systems linked to older fixed platforms and pipelines. These developments in technology are most apparent in the methods proposed to produce oil from the deeper water fields where subsea systems are increasingly proposed: