Safety Issues Surrounding Offshore Platform Removal

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Abstract
Decommissioned platform installations are now being removed from North Sea waters using heavy lifting crane vessels of either monohull or semisubmersible format. Lifting procedures may not be the reverse of installation and uncertainties may arise in respect of actual weight and centroid of the deconstructed units. Technical issues and hazard identification are discussed. Concerns and questions need to be raised and answered satisfactorily at each stage of planning, pre-lift inspection, during detachment, lifting and ultimate disposal. While recent operations have seemingly been successful, a safety regime needs to be assured since platforms due for removal will be of increasing size and new contractors could be drawn into the business.

Key Words
Decommissioning, Heavy Lifts, Crane Vessels, Deconstruction, Platform Removal, Offshore Safety.

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1. Introduction

Redundant platform installations have been removed during 1995 and 1996 from North Sea waters of about 100m depth using heavy lift crane vessels of either monohull or semisubmersible format. Those platforms weighing less than 4000t were brought ashore to be scrapped: increasingly they may be re-used, but it is unlikely they will be dumped into deep water. In all there are about 200 platforms on the U.K. Continental Shelf which will eventually have to be totally or partially removed. Platforms in deeper, more northerly waters are now being reviewed for removal and the techniques involved could enter into a new magnitude of difficulty. It is a large task which may draw new contractors into the business.

Although this paper has been compiled with the North Sea particularly in mind, the safety issues raised could be referred into any other part of the world where oil and gas platforms are due for deconstruction and removal. This paper refers solely to steel jacket structures and does not consider the large concrete gravity base platforms nor floating production units.

2. Heavy Lifting

The traditional view of a heavy lift offshore is of a topsides module weighing perhaps up to 8 per cent of the lifting vessel’s displacement. The lifting vessel may be a monohull crane ship or have the twin-hulled, multi-columned configuration of a semisubmersible. Cranes are usually able to revolve through 360 degrees. Definition of what is meant by a heavy lift should consider:

- Type of vessel
- Type of crane or manner of lifting
- Item to be lifted
- Size by mass or dimension
- Location of event.

In this emerging business of platform removal, new ship types and prospective handling schemes which may not incorporate traditional cranes should also be covered by guidelines controlling safe practices.

The crane vessels which installed the earlier platform topsides modules were often conversions from tankers or bulk carriers. The single crane was mounted at amidships or on the bow. Later purpose-built ships have better ballasting systems and are able to lift a load of up to 5000 tonnes. The particular advantage of semisubmersible crane vessels is their better motion keeping performance in most sea directions. Vessels may be fitted with a pair of cranes at one end so that a tandem lift can be made. In order to have adequate static stability while handling heavy loads, the columns may be designed with a rectangular rather than circular cross-section and water ballast is contained in high-level tanks as well as in the pontoons. Lifting capacities could be as high as 7000