



**DYNAMIC POSITIONING CONFERENCE**  
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**TRAINING SESSION**

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**Training and Competency for DP Operators**

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## **TRAINING AND COMPETENCY FOR DP OPERATORS**

### **Educational and Performance – Based Training for Human Intervention**

The performance of Dynamic Positioning (DP) Operators and support personnel has always been recognized as critical to operate successfully. To operate successfully requires the integration of several intricate requirements:

- DP system design, manufacturing, installation, and quality
- Management and operation of DP vessels
- Performance in operating and maintaining DP Vessels

### **Design, Production, Delivery, and Quality**

Hardware and software failures plagued the industry in the beginning years of DP. The inadequate design of control systems and equipment helped cause the majority of DP incidents.

Incidents of equipment failure led to improvements in design. For instance, it led to the engineering and inclusion of DP system redundancy. Redundancy eliminated single point failures.

Hardware and software failures also led to system specific studies like Failure Mode and Effect Analysis (FMEAs) and Consequence Analysis which are now integral parts of the DP system design and production.

Unless the design and production of each DP system is valid and consistent with the vessel owners' requirements, the successful operation is pre-doomed to failure. Design and production are not the only considerations of the DP vessel owner for acquisition of equipment and systems. Equally important are delivery and quality of the product. The best designed and built equipment is of little use if the installation of the equipment is incorrect. Additionally, if the equipment is not reliable, success is lost.

Reliability is achieved through factory testing, field-testing, and companies' procedures on installation, follow-up service and parts availability. Procedure development and employee training are essential for providing quality products and service.

### **Management and Operation**

Considerable resources have been invested in developing the management and operation of DP vessels. The owners and operators have been pro-active in the development. The owners and operators are driven to reach high levels of client satisfaction, increased productivity, reduced downtime and minimal negative incidents.

The clients have also contributed to this development. They are justifiably anxious to protect their offshore investment. DP operation results are inherently uncertain every time a DP vessel is performing routine operations attached to a well head or working near a client's platform.

There have been many influences in developing and implementing acceptable standards for DP operations. One such effort was the joint Norwegian/British document, "The Guidelines for the Specification and Operation of DP Vessels", published in 1980 and revised in 1983. Another effort for establishing management and operational guidelines was the DPVOA (now IMCA) "Guidelines for the

Design and Operation of DP Vessels, 1989". Probably the most effective effort for improved operation is The Nautical Institutes certification program for DP Operators.

### **Performance in Operation and Maintenance**

The function of the DP operator has been recognized as critical in the industry. The emphasis has been in providing standards for training and then providing the means to achieve those standards.

In the early 1980s, a DP Operator training scheme was established that incorporated shore based training centers with offshore experience. This was initiated by the industry and the guidance of The Nautical Institute. Now several Training Centers provide DP Operator courses and certification.

No one doubts the importance of the DP operator being trained and certified. This has been the industry self-governing answer to regulatory bodies', thus far, decision not to regulate DP operations.

However, the DP operator is not the only human factor in the overall equation for DP operation. The performance of other personnel is just as important to ensure successful DP operation. In order for the equipment, once installed properly, to continue to provide reliable performance, parts and systems must be maintained and periodically replaced.

Technical expertise is a vital link in the continued success of DP operations. The DP owner and operator are challenged in two basic areas: acquiring qualified personnel and training this personnel to become competent at maintaining the equipment. The hiring of qualified persons is both expedient and cost effective. The only problem is finding such workers. There is an industry wide shortage of qualified DP Technicians. The alternative for getting the needed personnel is to hire workers with basic technical knowledge and skills and train them to the DP owner's specific needs. The importance of the training required to properly and competently train DP Technicians is so important, many owners, clients, and governmental agencies feel that standards and certification are warranted.

Training for DP personnel, as previously illustrated, is a lot more than examining the activities of the DP Operator, standing or sitting at a DP console. The real scope of training entails the whole range of vessel and company DP operation activities. It includes personnel participation in design, manufacturing, installation, maintenance, and management as well as operation.

There are five specific areas of significance to DP operations and thus the training of DP Operators:

- Personnel and equipment interface
- Management styles
- Training and competence
- Stress identification
- Personnel behavior

The performance of DP Operators can be measured against three basic responses to their expected performance during training:

- Skill-based responses
- Ability-based responses
- Knowledge-based responses

## Skill-based Responses

In a skill-based response, actions are pre-learned and repeated, automatically, to achieve a goal. Skilled-based actions are capable of being copied or repeated automatically. DP Operators perform many skill-

based responses. Operating the DP console, DGPS, Acoustic Systems, etc. are all examples of skill-based responses. The verification of these responses in the context of training or competence is simple. Simply ask the DP Operator student to perform a skill and observe the proper execution for evaluation.

## Ability-based Responses

In an ability-based response, there are standardized or customary procedures for doing certain activities. The procedures are consciously followed without considering possible alternatives. Some of the ability-based responses that DP Operators perform include DP setting up procedures, filling out logbooks, and completing various checklists prior to operation. These and many more are considered routine operations. During training, these are as easy to evaluate as skill-based responses.

## Knowledge-based Responses

Knowledge-based responses are more complex. In knowledge-based responses, the DP Operator is required to exercise discretion and to carry out problem solving, planning and choosing between alternative courses of action. Knowledge-based responses to problems cannot be resolved simply by resorting to a skill-based response or following a set procedure. Despite universal attempts to turn most actions into the exercise of a skill or the compliance with a procedure, we still have not reached the stage where we can discontinue rational thinking by DP Operators. They are required to assess a situation and choose an appropriate course of action from a number of alternatives while still observing their acquired skills and complying with relevant procedures. Knowledge-based responses have to be taught in a realistic atmosphere. This can be in real life situations on-board the vessel, or can be accomplished through real life scenarios on a simulator in the classroom. Although real life is the best teacher, creating real emergency scenarios on-board the vessel is not practical. Simulator training has been very effective in developing these real life scenarios in many industries, i.e. training airline pilots. It is also very effective in the DP Operator Certification program as outlined by The Nautical Institute.

Training and competency development is the most challenging endeavor for DP owners and operators. What is really meant by training and competency is personnel performance development.

The Nautical Institute has a scheme for training DP Operators that combines offshore experience with classroom education and simulated performance. The training scheme outlined by The Nautical Institute is designed to produce competent performance in DP Operators.

There are two types of training: educational-based training and performance-based training. Educational-based training teaches knowledge-based and skills-based responses to actions and performance-based training teaches ability-based responses to actions. Both types of training are necessary to develop DP personnel into competent performers. Competency, by definition, is the ability to perform to an expected standard.

In order to identify training needs for performance development, an expected standard for performance must first be established. Each DP owner and operator has the responsibility and obligation to set an adequate standard for expected performance. It is easy to follow a predetermined scheme, such as offered by The Nautical Institute, but does that allow for all training needs for all personnel involved in the DP vessel's operation.

A competency development plan should be established for each worker involved with DP operations. This plan should include both job specific requirements and requirements for each element of the DP system installed on a given vessel. The plan should incorporate both educational-based and performance-based requirements.

Once the competency plan is developed, a training analysis can be performed that will identify the training necessary to reach competency in performance.