



**DYNAMIC POSITIONING OPERATOR
TRAINING SCHEME
ACCREDITATION STANDARD**

January 2016

Revised version 1.2

Effective Date 1st January 2016

DISCLAIMER

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DYNAMIC POSITIONING OPERATOR TRAINING SCHEME ACCREDITATION STANDARD
Revised version 1.2 – January 2016

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TRACKING OF CHANGES

Page	Subject	Original content v1.1 (October 2015)	New content v1.2 (January 2016)
Title pages	Version control	Version 1.1 October 2015	Version 1.2 January 2016
15, 18, 20, 22, 28, 29, 34		Minor adjustments to sentence construction and vocabulary	
7 & 8	Change to Secretary to DPTEG	Accreditation Director	Accreditation Manager
11	Clarification of duration		Insert 'each' to clarify minimum duration of courses
12	Clarification of duration	total	Replace 'total' with 'minimum' to clarify minimum duration of courses B and C
16	Documents to submit to The Nautical Institute	Licence to operate a centre	Licence to operate a centre from the relevant local or national authority
16	NI status as non-profit		Delete: <i>With over 80 centres around the world it is vital for training centres to meet the deadlines they agree to as the auditors are travelling/working to a very tight schedule.</i>
18	NI status as non-profit		Delete: <i>Is a not for profit organisation and</i>
20	Satellite centre	When the parent company is audited, it will be subject to audit of all items related to any satellite centres that it may have. This means that the number of days needed to run the accreditation visit may increase from two to five days, depending on the number of satellite centres dependent on the parent company. The annual DPTEG fee will be charged to the parent company, in scale, according to the number of dependent satellite centres.	When the parent company is audited, it will be subject to audit of all items related to any satellite centre that it may have. This means that the number of days needed to run the accreditation visit may increase from two to five days, depending on the number of satellite centres. The annual DPTEG fee will be payable whether the centre is a parent centre or a satellite centre.
24	Cadets (Adoption of DPTEG recommendation)	Prospective DPOs who are in the process of training for an STCW certificate can start the DP scheme and complete the Induction course and 30 days DP sea time only between the Induction and Simulator course. The Simulator course and the remaining DP sea time training can only be completed after they hold an appropriate STCW Certificate of Competency. Prospective DPOs not meeting the	Prospective Offshore DPOs on the new scheme who are in the process of training for an STCW certificate may complete Phase A, the Induction course, the 60 days DP sea time of Phase B and Phase C, the Simulator course. The remaining DP sea time training can only be completed after they hold an appropriate STCW Certificate of

		<p>above requirements will be able to apply for certification if they commenced training prior to the implementation date (1 January 2012) and all elements have been completed within a five-year period at the time of application.</p> <p>Note that the time to complete the training scheme for those who started the Induction course after 1 January 2015 is four years.</p> <p><u>Centres should keep electronic copies of students' documentation for audit purposes as well as for reference should any questions arise at a later stage in the student's application process.</u></p>	<p>Competency.</p> <p>Cadets are not allowed to claim for Sea Time Reduction (STR) in phase D of the training scheme.</p> <p>These rules are effective from 1st January 2016 and apply to those who have already commenced training on the new scheme as well as new starters.</p> <p>There are currently no changes to the requirements for Cadets on the Shuttle Tanker Scheme or those on the old Offshore Scheme.</p> <p>Note that the time to complete the training scheme for those who started the Induction course after 1 January 2015 is four years.</p> <p><u>Centres should keep electronic copies of students' documentation for audit purposes as well as for reference should any questions arise at a later stage in the student's application process.</u></p> <p>Prospective DPOs who are not Officer Trainees and thus not meeting the above requirements will be able to apply for certification if they commenced training prior to the implementation date (1 January 2012) and all elements have been completed within a five-year period at the time of application.</p>
28	DP sea Time 5g		<p>Delete:</p> <p><i>Prior to the 2013 review of The Nautical Institute DP Training Scheme, 30 days of DP sea time prior to the Induction course was accepted.</i></p>
71	Simulator Spec preamble		Change to words as agreed by DPTEG

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INTRODUCTION TO THE DYNAMIC POSITIONING OPERATOR TRAINING STANDARD

This document provides guidance on the Dynamic Positioning Operator (DPO) training scheme for providers wishing to be accredited to deliver training.

The DP Accreditation and Certification schemes were developed by The Nautical Institute, working in association with flag states, the oil industry, the diving industry and offshore contractors to establish internationally accepted standards. It has been operational for the past 30 years.

In September 1983, the scheme was adopted as an internationally accepted standard for any DSV or other DP-operated vessel working within any designated 500 metre zone at any offshore installation by 105 out of 110 oil industry and major oil company representatives at a working conference in Aberdeen. It was rapidly recognised by the oil industry on a worldwide basis.

Less than a month after the Aberdeen conference, the scheme was accepted as an official guideline by the then Minister of Energy for the UK North Sea operations. Shortly after, it was also adopted by other North Sea operating flag states.

The Nautical Institute has developed this accreditation standard in view of the IMO resolution to include DP training within Part B of the STCW Code & Convention (APPENDIX A). These standards have been developed and kept up-to-date with the full engagement and cooperation of all key stakeholders by working through the Dynamic Positioning Training Executive Group (DPTEG) and its Regional Training Provider (RTP) groups.

1a. COMPOSITION AND ROLE OF DPTEG

In order to ensure that the scheme continues to meet current industry needs, the Dynamic Positioning Training Executive Group (DPTEG) was established to facilitate communication and input from a broad range of stakeholders.

The group is a pan-industry forum of training providers, trade organisations and professional associations which have a remit or interest in DP training. It is self-funded by raising fees from accredited DP training providers, and currently meets twice a year.

The remit of DPTEG is

- to review and develop the DP Operator Training Scheme in respect to an ever changing maritime industry and regulatory environment.
- to evaluate its effectiveness in providing the DP industry with trained DP Operators.
- to make decisions and to implement actions to improve the DP Operator Training Scheme and promote best practice.
- to make decisions on a consensus basis.
- to defend the standing of the DPO Training Scheme in the best interests of all DPTEG members.

DPTEG Member organisations are:

- International Association of Drilling Contractors (IADC)
- International Chamber of Shipping (ICS)
- International Dynamic Positioning Operators Association (IDPOA)
- International Marine Contractors Association (IMCA)

- International Support Vessel Owners' Association (ISOA)
- Oil Companies International Marine Forum (OCIMF)
- Accredited DP training providers represented by their regional representative in the area (RTPs America, Europe and Asia)
- The Nautical Institute

Other organisations may be invited to join DPTEG as appropriate.

1b. THE ROLE OF REGIONAL TRAINING PROVIDERS (RTP)

The training providers are located throughout the world. Since they are widely dispersed and it would be unrealistic for all training providers to gather in one location, the centres were grouped into broad regions. These regions are:

- The Americas
- Europe, the Near East and Africa
- The Far East and Australia

Each region elects a group representative/coordinator whose job it is to inform the group of DPTEG developments and gather group concerns/responses in order to relay these to DPTEG or ask that they be included in the DPTEG meeting agenda. Communication with training providers in their region is accomplished by email or web forum contact and relayed using the same means to the DPTEG Chairman or other persons/groups as appropriate.

Every year each of the three regions holds an RTP meeting. Each training centre must send a representative to a meeting at least once every three years as a condition of accreditation. If a training centre is not sending a representative, the centre can relay its concerns/responses through the regional representative/coordinator.

Not sending a representative at least once every three years is grounds for withdrawal of accreditation.

Some of the costs of attending these meetings can be reimbursed as outlined in The Nautical Institute travel expenses policy (APPENDIX I)

The regional representatives/coordinators attend the bi-annual DPTEG meetings to represent the interests of all training providers worldwide.

1c. THE ROLE OF THE NAUTICAL INSTITUTE

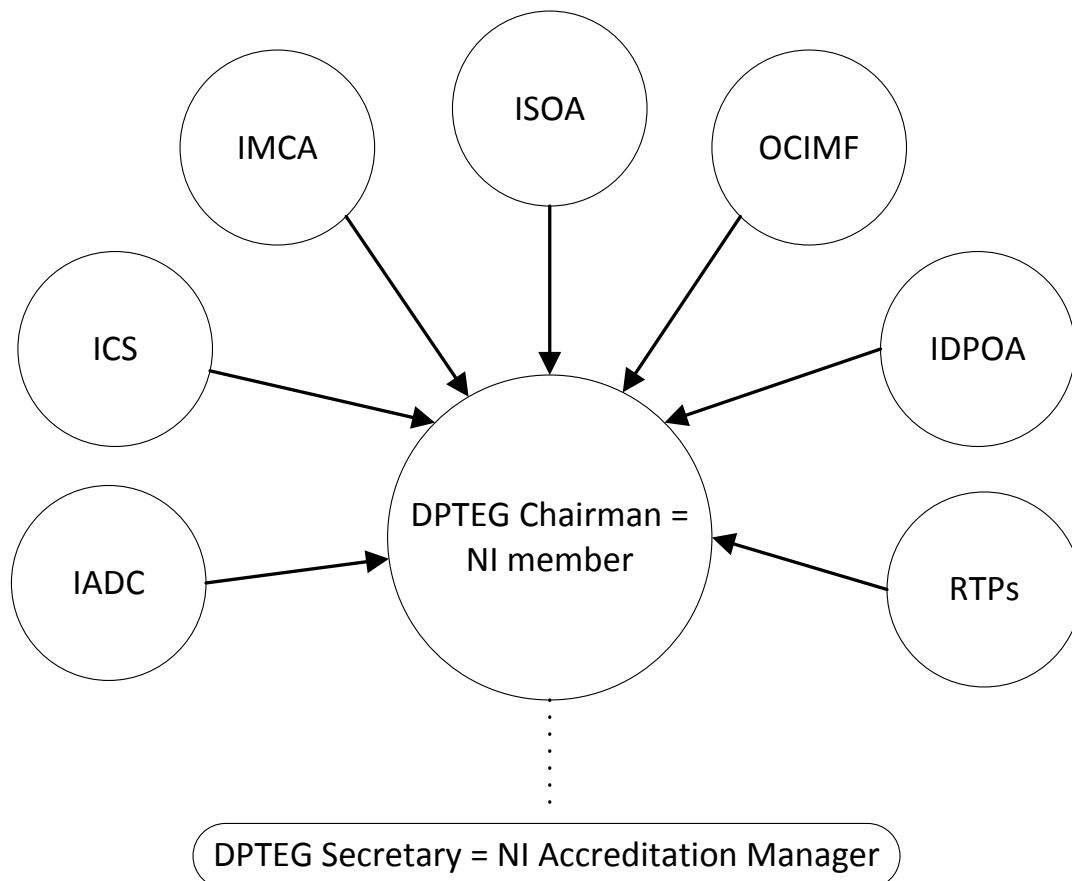
The Nautical Institute facilitates consensus building among DPTEG members and administers the accreditation of DP training centres and the certification of DPOs in accord with the criteria agreed by DPTEG.

The Chairman of DPTEG will be a senior representative of The Nautical Institute with relevant experience who will be selected and elected through the Institute's governance process. He/she will be supported by the Institute's Accreditation Manager acting as the Secretary to DPTEG. The Institute personnel may be supported by a DP Technical Advisor who shall be a member of the Institute. The Secretary and DP Technical Advisor will be non-voting members of DPTEG.

Where consensus on a proposal cannot be reached a vote of the members present (in person or electronically, or as provided prior to the meeting in writing by those absent) may be taken on the basis of one member one vote. In the event of a tied vote, the Chairman may exercise a casting vote. The minutes shall record the result of such votes and shall indicate any members in disagreement with the decision.

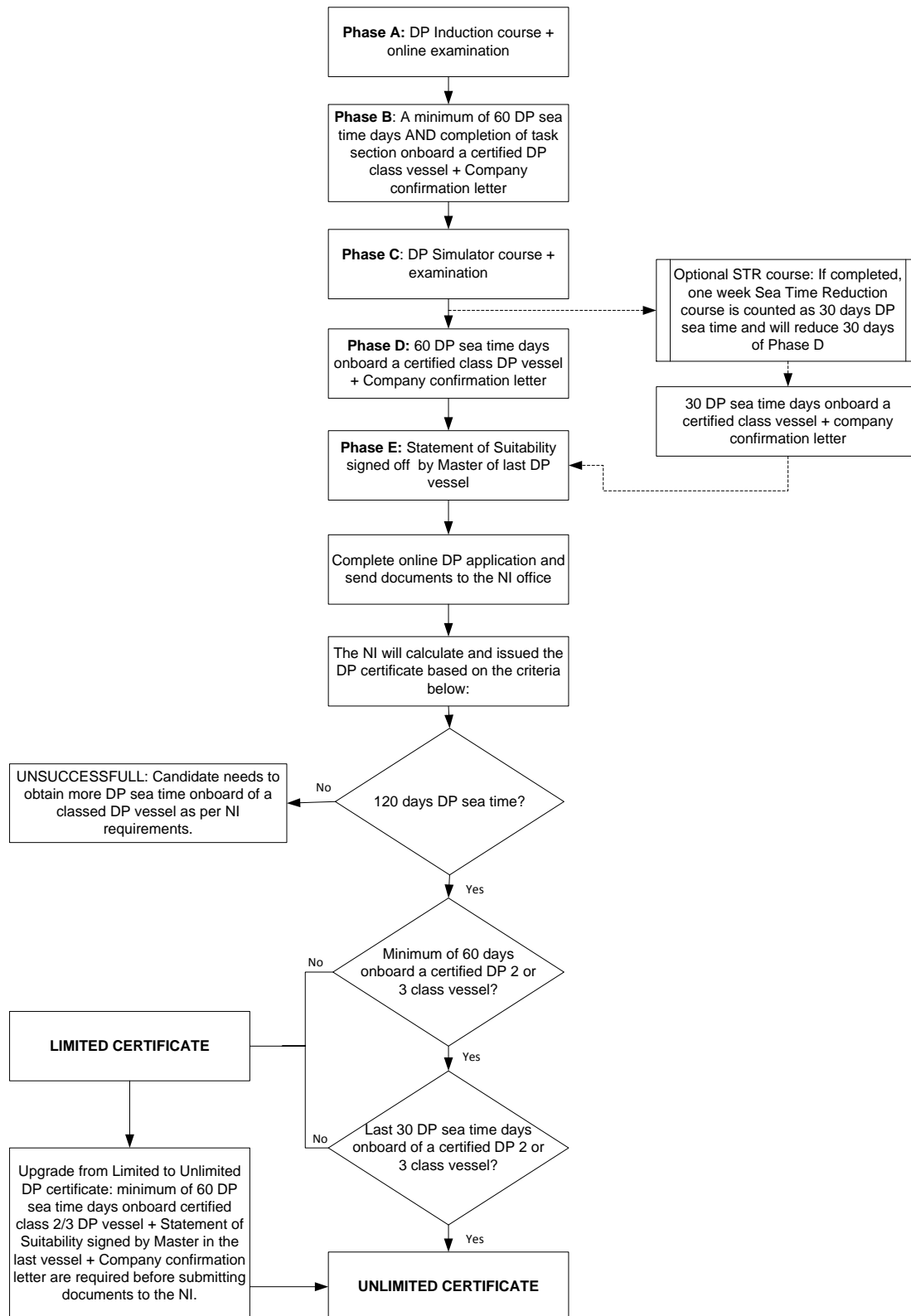
The Secretary to DPTEG shall be responsible for the preparation of the agenda for each meeting in consultation with the Chairman and members. The agenda and supporting papers should be circulated to members at least five weeks in advance of the meeting. It is therefore important that members wishing to propose agenda items should contact the Secretary at least six weeks in advance of the meeting and supply any supporting papers at that time or by the circulation date of the agenda.

During the meeting, action points shall be agreed and DPTEG may wish to circulate those to their members. The Secretary shall be responsible for preparing the draft minutes of the meeting, agreeing them with the Chairman, and circulating them to the members within a reasonable timescale (usually two weeks) after the meeting. The members of DPTEG will be invited to provide any amendments to and their confirmation regarding the accuracy of the draft minutes prior to their final circulation to and reporting at the Institute's Executive Board. DPTEG members may wish to promulgate the minutes to their members, but should not do so until the minutes are agreed. In exceptional circumstances, e.g. where the reputation of the Nautical Institute is deemed to be at risk, the NI Executive Board may require DPTEG to reconsider a decision.

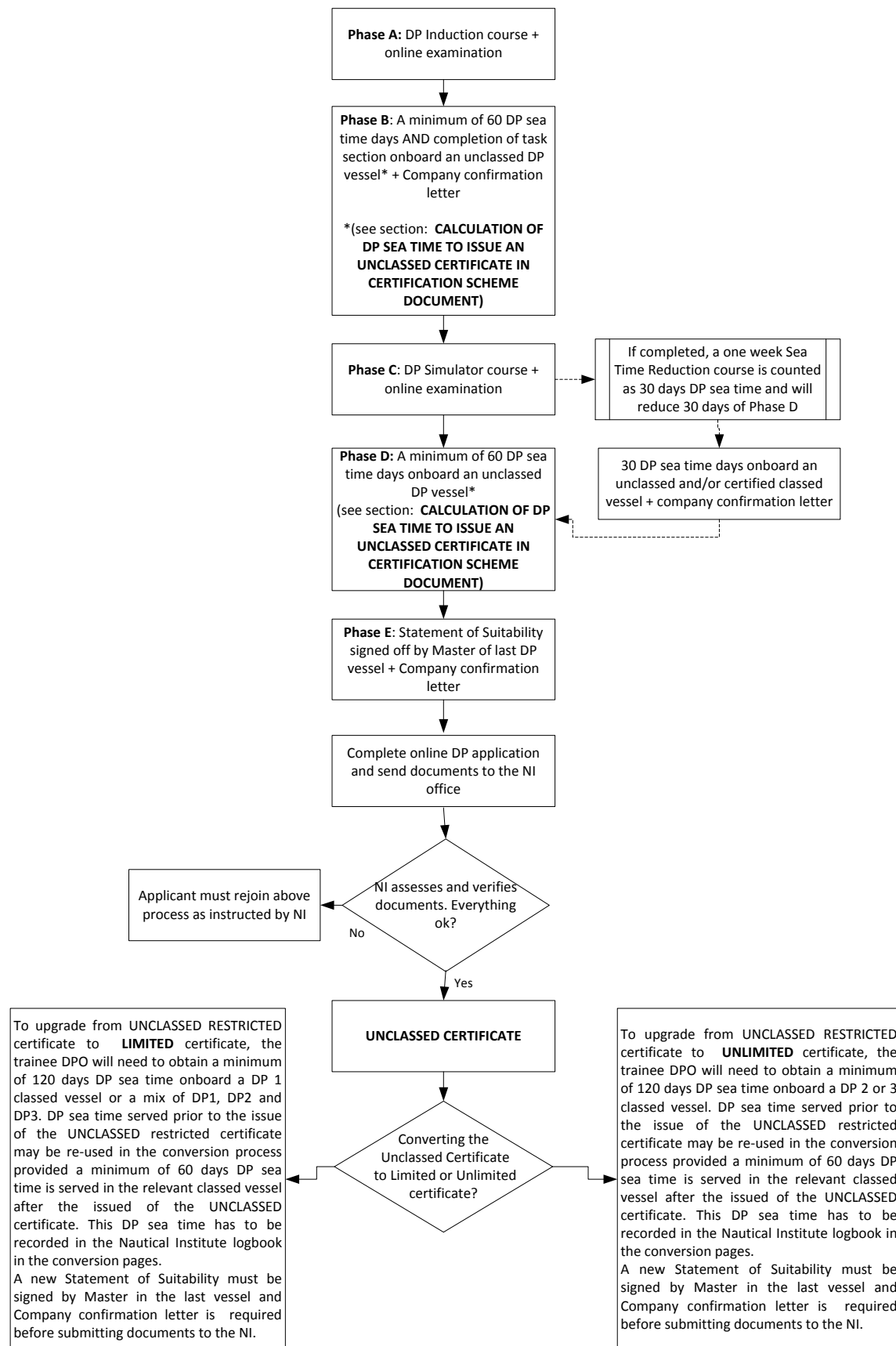


OVERVIEW OF THE NAUTICAL INSTITUTE DYNAMIC POSITIONING OPERATOR TRAINING SCHEME

The route that must be followed in order to obtain a DP Operator certificate (LIMITED and UNLIMITED):



The route that must be followed in order to obtain a DP Operator certificate (restricted to UNCLASSED vessels)



ACCREDITATION

3a. DEFINITIONS

Accreditation is defined by The Nautical Institute as the systematic verification of the processes, procedures, methods and techniques employed to deliver a maritime training product or service in accordance with standards defined, co-developed and approved by The Nautical Institute with industry stakeholders.

Accredited training providers have demonstrated that their product or service meets the standard required for Nautical Institute accreditation. This award is valid for a period of not more than three years.

Recognition is defined by The Nautical Institute as the process of assessing and endorsing a maritime training product or service which aligns with the constitutional aim of The Nautical Institute of raising professional standards and supporting professional development.

Normally products and services recognised by The Nautical Institute are those which have been considered to meet the following criteria:

1. Availability and accessibility to an international maritime audience
2. Evidence of consultation with industry stakeholders on product or service content
3. Evidence of regular review
4. Not subject to government regulation and audit

Normally recognition is valid for a period of not more than one year.

To assess is to evaluate the nature, ability or quality of the object assessed.

To verify is to prove the truth of by presentation of evidence or testimony; to check the accuracy of the object examined.

To approve is to have a positive opinion that something is good or acceptable.

A training centre wishing to offer DP courses formally applies to The Nautical Institute. The Institute sends auditors to assess the courses delivered by that training provider to verify that they meet the standards defined by DPTEG and described in this document. The recommendation of the audit team will be discussed by the NI Accreditation Team and if the decision is made to approve the courses the Institute will accredit that centre.

3b. WHAT IS ACCREDITED?

There are two required courses within the training scheme that leads to either a Limited or an Unlimited DP Operator Certificate, the Induction course and the Simulator course. Both of these courses last between four and five days and each should contain a minimum of 28 hours of tuition.

A centre receives accreditation to deliver both courses. Accreditation will not be given to a centre that delivers only one of the two courses.

In addition to the required courses, trainee DP operators may reduce their sea time requirement by attending a Sea Time Reduction (STR) course. This course should contain a minimum of 37.5 hours of tuition.

A training provider may apply for accreditation to deliver an STR and Shuttle tanker courses. These shall be running during the NI audit in order to be checked and approved.

The Induction and Simulator courses are also required for trainees on the Shuttle Tanker Scheme. In addition to the Induction and Simulator courses, a training centre wishing to deliver shuttle tanker training will need to offer two additional simulator courses.

INDUCTION COURSE

This course involves both theory and practice on a simulated DP system and covers the following topics:

- Principles of DP
- Elements of the DP system
- Practical operation of the DP system
- Position reference systems
- Environment sensors and ancillary equipment
- Power generation and supply and propulsion
- DP operations

SIMULATOR COURSE

This course principally involves simulated DP operations including errors, faults and failures, giving the participants the opportunity to apply the lessons learnt in both the Induction course and the time spent during seagoing DP familiarisation.

It covers the following topics:

- Practical operation of the DP system
- DP operations
- DP alarms, warnings and emergency procedures

SEA TIME REDUCTION COURSE

The period of supervised DP watchkeeping during the second block of DP sea time may be reduced by the satisfactory completion of an intensive DP simulator training course.

SHUTTLE TANKER TRAINING

The Shuttle Tanker training scheme requires the trainee to complete the Induction and Simulator courses required of all other DP trainees. In addition, Shuttle Tanker trainees must complete three additional courses:

COURSE A

One or two day training courses provided by the manufacturers of position reference systems. These courses are recognised, not accredited, by The Nautical Institute.

COURSE B

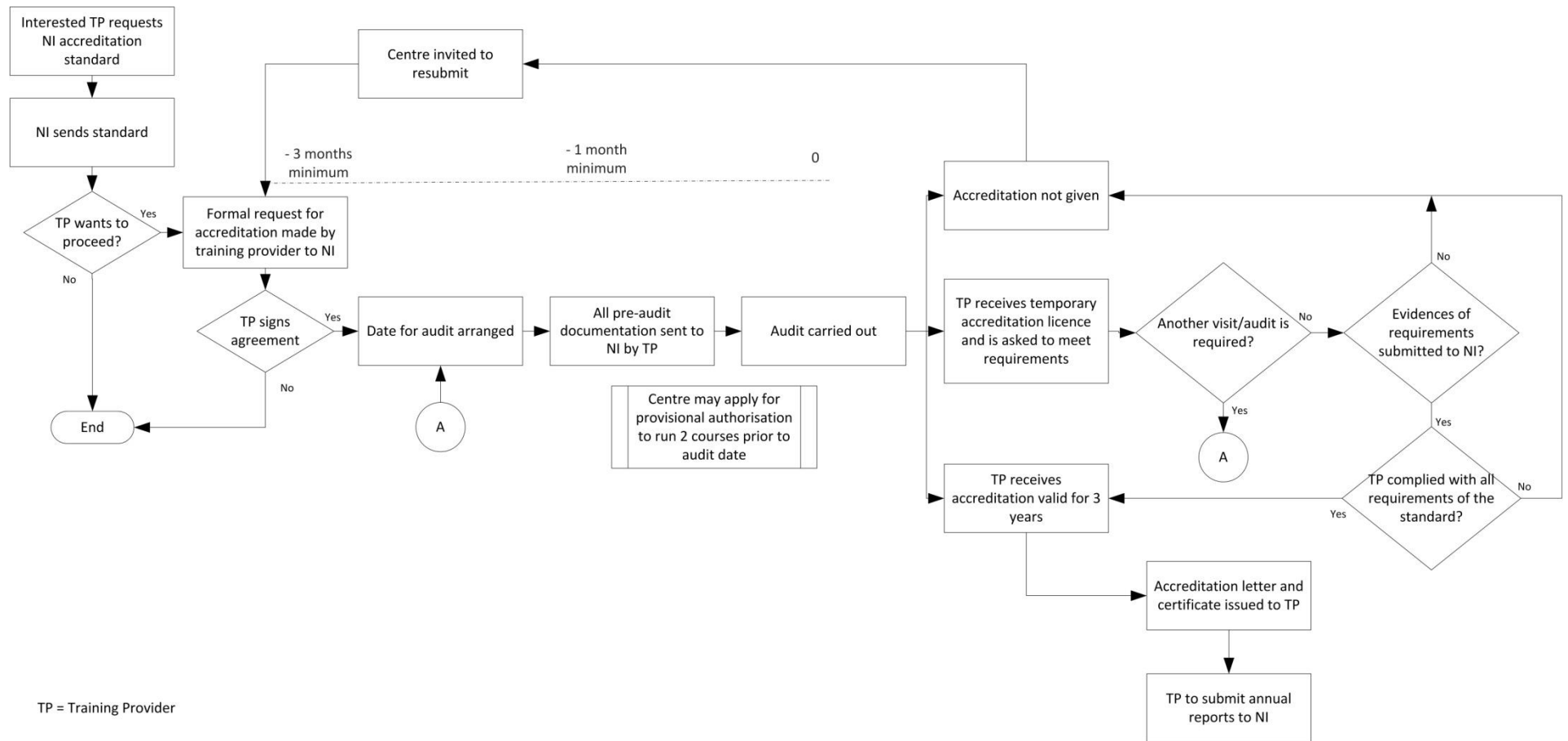
This is a five-day simulator training course with a minimum of 30 hours of instruction that concentrates on shuttle tanker specific behaviours and includes exercises for a range of offshore loading installation types. This course is accredited by The Nautical Institute.

COURSE C

This is a five-day simulator training course with a minimum of 37.5 hours of instruction. The course is similar to the STR course but requires that the exercises are not done in shuttle tanker operations. Unlike the STR course, there is no reduction of DP sea time requirements as a result of this course. This course is accredited by The Nautical Institute.

In the process of accrediting a training centre to deliver the above courses, the Institute's auditors will assess and verify the centre's administrative and record-keeping processes, the training and experience of the instructors, the physical environment of the centre and the simulators/classroom equipment used to deliver courses.

3c. OVERVIEW OF THE NAUTICAL INSTITUTE ACCREDITATION PROCESS



3d. DESCRIPTION OF THE NAUTICAL INSTITUTE ACCREDITATION PROCESS

3d(i) INTERESTED TRAINING PROVIDER REQUESTS ACCREDITATION STANDARD

Any person/s interested in opening a DP training centre can request a copy of this document which is also available on the NI Alexis Platform website.

3d(ii) THE NAUTICAL INSTITUTE SENDS STANDARD

3d(iii) POTENTIAL TRAINING PROVIDER DECIDES TO PURSUE ACCREDITATION

A training provider wishing to seek Nautical Institute accreditation can do so by contacting the Institute's Accreditation team and following this contact with a formal written request for accreditation.

3d(iv) CONTENTS OF A FORMAL REQUEST FOR ACCREDITATION

The formal request for accreditation should contain the following information:

- Details of the centre
- Details of the contact person at centre
- The name of the course or programme (Induction and Simulator; Sea Time Reduction; Shuttle Tanker)
- Description and layout of the equipment
- CVs including photos and DP certificates of instructors
- A copy of each instructor's training programme signed off by an experience training DP instructor (see definition in Appendix C/1)

3d(v) TIMING OF THE REQUEST

The Institute requires centres to apply for accreditation at least three months before the date requested for assessment so that pre-assessment queries can be resolved and travel booked in good time.

3d(vi) ACCREDITATION AGREEMENT

Before progressing any further along the accreditation process, the training provider must sign an Accreditation agreement with The Nautical Institute.

3d(vii) SETTING AN AUDIT DATE

The Institute and the training centre will agree a date for the audit based upon availability of auditors and the schedule of courses at the centre. The audit (for new accreditation or reaccreditation) must take place while a Simulator course is being run. If a full class of students is not available, suitably qualified individuals may sit the course at the time of the audit, so that the auditor can check on the simulator equipment as well as the teaching methodology and other elements of the course.

3d(viii) THE AUDITORS

At all times there will be a minimum of two auditors, one of whom will audit the technical equipment and teaching methodology and the other a trained auditor linked to the Institute's administrative staff who will audit the centre's administrative and management procedures. Additional specialist assessors may be called in when appropriate.

3d(ix) DUTIES AND CONDUCT OF ACCREDITATION TEAM MEMBERS

Team members will:

- Review and report on the materials submitted by training centres.
- Participate in accreditation visits and related activities in accordance with the guidelines, policy and procedures specified by the Institute.
- Maintain confidentiality with respect to information gained from centres during the accreditation process. They will not discuss the training centre's activities, duplicate training materials received from the centre or discuss confidential information without the appropriate permissions.
- Return all training materials received from a centre either to the centre or the Institute.
- Act in the best interest of The Nautical Institute and in accordance with good professional conduct.

3d(x) DOCUMENTATION TO SUBMIT TO THE NAUTICAL INSTITUTE PRIOR TO THE AUDIT

The assessors will receive the following documentation a **minimum** of one month before the audit takes place:

- Instructor's manual for each course, including course timetable, lesson plans for each module and copies of Powerpoint presentations
- Student handouts and materials
- Licence to operate a centre from the relevant local or national authority
- CVs including photos and DP certificates of instructors
- A copy of each instructor's training programme signed off by an experience training DP instructor
- Copy of IMO train the trainer or teaching certificate and copy of IMCA or NI logbook of each instructor
- Health and safety information
- Attendance list, feedback forms, and methods for assessing students
- Example certificates
- Administration procedures to cover registration/booking, logbook control etc
- Management review policy
- Performance appraisal policy for instructors
- Complaints policy
- Control of documents policy

If the documentation is not received in a timely manner the Institute may cancel the arranged audit, with the resulting loss (travel/accommodation costs/etc) borne by the training centre. To maintain a high audit standard, the NI auditors need time to review documentation before arriving at the centre.

3d(xi) PROVISIONAL ACCREDITATION

Prior to the audit, a training provider may request provisional accreditation. This is restricted to selected courses and is given after submission of all the course documentation and instructor qualifications, provided they are of an acceptable standard. The maximum allowance is the delivery of two courses prior to the audit day, which requires approval in writing from The Nautical Institute. This enables the course provider to advertise and supply courses pending the formal accreditation.

If the accreditation is successful the provider will normally be accredited for three years, subject to the provider submitting an annual report.

Where an application for accreditation is unsuccessful, the provider will be told the reasons and invited to re-submit its application. The Nautical Institute aims to be supportive throughout this period.

3d(xii) WHAT WILL BE ASSESSED AND VALIDATED DURING THE AUDIT?

In addition to validating the originals of some of the documentation listed in

- 3d(iv) Contents of a formal request for accreditation,
- 3d(x) Documentation to submit to The Nautical Institute prior to the audit, and
- 5f Instruction manuals

the auditors will also assess/verify:

- the correct use of equipment, particularly in relation to simulator exercises
- practical exercises and how they are conducted
- record-keeping and administrative arrangements (logbook control, issuance of certificates of completion, control of documents etc.)
- accommodation, lecture rooms, equipment and safety considerations
- assessment methods and how results are used to monitor student understanding and thus instructor performance as well as trigger preventive/corrective actions in relation to course materials/content/delivery
- a formal student feedback system concerning the content and conduct of the course
- maintenance arrangements and records, including a copy of the equipment maintenance certificate.

3d(xiii) THE AUDIT PLAN

In most instances the audit will proceed according to the following schedule:

- Pre-audit all materials submitted to the Institute by the training provider will be reviewed.
- Day 1 of audit opening meeting; auditors split up with one assessing the administrative/record-keeping and facility side of the training centre and the second assessing the technical side; course delivery will be observed.
- Day 2 of audit any items outstanding are assessed; course delivery will be observed; a closing meeting will be held to discuss the audit findings.
- Post-audit all audit findings will be documented and discussed with the NI Accreditation Team; a decision will be made regarding the accreditation status of the training provider; this decision will be given to the centre by email, followed up by formal letter.
- Additional days will be required for centres seeking STR, Shuttle Tanker accreditations.

3d(xiv) THE DECISION TO ACCREDIT

The Nautical Institute will write formally to award accreditation at three levels:

- Accredited: the centre will be accredited to deliver courses for three years and will be required to submit annual reports to the Institute throughout this period
- Accredited subject to minor or major improvements:
 1. Minor improvements: the centre must make minor improvements during which time the centre will usually be allowed to continue delivering courses. Depending on the nature of the improvements to be made, written and/or photographic evidence of the improvement may be all that is required by the Institute from the centre. In certain instances a follow-up visit may be required by the auditor/s. Once the improvements have been completed and validated, the centre will be accredited to deliver courses for three years from the date the initial audit was carried out and will be required to submit annual reports to the Institute

throughout this period

2. Major improvements: Accredited on completion of significant improvements which must be confirmed by due dates; the centre must make significant improvements during which time the centre may have to suspend the delivery of courses. In most cases where significant improvements are required a follow-up audit will be required. This is at the expense of the training centre. Once the improvements are completed and validated, the centre will be accredited to deliver courses. However, a shorter period than the usual three years may be stipulated. During the period for which accreditation is granted the training provider will be required to submit annual reports to the Institute.
- Failure with reasons and invitation to re-submit.

3d(xv) WITHDRAWAL OF ACCREDITATION

Accreditation may be cancelled or withdrawn for any of the following reasons:

- Failure to settle the accreditation/re-accreditation invoice within 90 days
- Failure to be re-accredited within three months of the expiry date of the existing accreditation (unless agreed with The Nautical Institute)
- Bankruptcy/receivership or liquidation of the accredited training provider or their parent organisation
- Failure to notify the Institute of significant changes to the management, training delivery or instructors
- Failure to attend a Regional Training Providers (RTP) meeting, where available, within a three-year period.
- Misrepresentation, misuse, abuse or misdemeanour relating to the accreditation by the accredited training provider
- Failure to comply with The Nautical Institute's policies for accreditation and certification
- Failure to submit an annual report
- Engaging in any illegal activity
- End of partnership or joint-venture between two accredited organisations
- Outstanding invoices in relation to logbooks/books for over 90 days.

3d(xvi) RECOGNITION AND CERTIFICATION

On successful accreditation, The Nautical Institute will issue a certificate to the provider with authorisation to add the Institute's logo and the words *Accredited by The Nautical Institute* to its course literature.

3d(xvii) THE COST OF ASSESSMENT

The Nautical Institute will carry out the assessment at full cost recovery plus administrative overheads.

Typical costs are as follows:

- Pre-course assessment, reviewing documentation - two person-days
- Course assessment – two person-days x 2
- Travel and accommodation as relevant
- Expenses, taxis, meals if relevant
- Follow-up action, providing certification etc. - one person-day
- Any local tax

Further details are provided in the accreditation agreement

3d(xviii) WHEN A CENTRE CHANGES LOCATION OR SIMULATOR

If a training centre changes location/premises or simulator it must notify The Nautical Institute of that fact. A date will be arranged and a new audit will be carried out at the cost of the training centre.

3d(xix) SPOT AUDITS

The Nautical Institute retains the right to visit any accredited training centre, with a minimum 24 hours notice, to carry out a spot audit for the purpose of maintenance of accreditation standards. The cost for such a spot audit will be borne by the training centre.

3d(xx) BRIBERY ACT 2010

The Nautical Institute, being a charity registered in the UK, is subject to the UK Bribery Act 2010.

The Bribery Act 2010 is an Act of Parliament of the United Kingdom that covers the criminal law relating to bribery. It entered into force on 1 July 2011. The Act repeals all previous statutory and common law provisions in relation to bribery, instead replacing them with the crimes of bribery, being bribed, the bribery of foreign public officials, and the failure of a commercial organisation to prevent bribery on its behalf. The penalties for committing a crime under the Act are a maximum of 10 years' imprisonment, along with an unlimited fine, and the potential for the confiscation of property under the Proceeds of Crime Act 2002, as well as the disqualification of directors under the Company Directors Disqualification Act 1986. The Act has a near-universal jurisdiction, allowing for the prosecution of an individual or company with links to the United Kingdom, regardless of where the crime occurred.

3e. HARMONISATION OF STANDARDS

The policy of The Nautical Institute is:

1. To ensure that courses conducted by different establishments for the same purpose meet the same standards.
2. When blended learning or other techniques are used as a means of preparation or delivery, the programmes are harmonised with the course objectives.
3. When courses cover several different disciplines, the appropriate people with the required experience and qualifications are utilised for each section.

3f. THE NAUTICAL INSTITUTE'S QUALITY STANDARDS AND AUDIT PROCEDURE

The procedures in this standard have been approved by the Institute's Executive Board, which has delegated their detailed application to the Institute's DP Training Executive Group (DPTEG). The Group is kept informed of DP accreditation activities and keeps the accreditation and certification process under review. DPTEG is maintained by an annual fee, which is paid by every accredited training centre in April of each year.

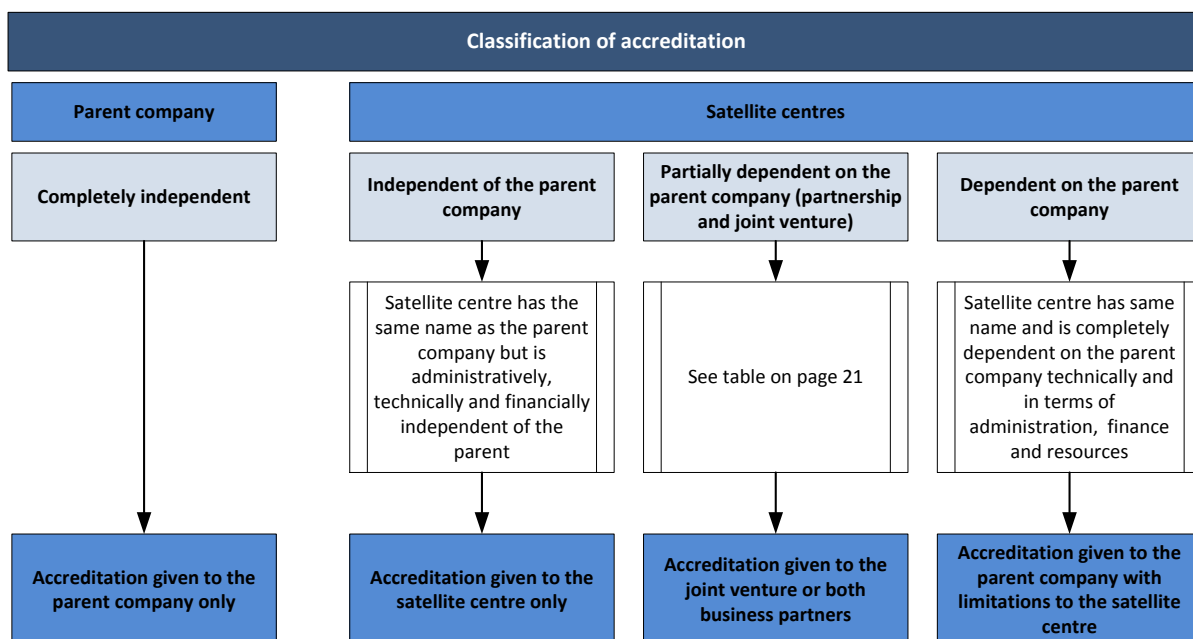
ACCREDITATION OF SATELLITE CENTRES

The Nautical Institute recognises that DP training providers may extend their training provision to external training sites, utilising the facilities and equipment made available by a third party. Usually, through some mutual agreement, the facility provider and training provider arrange for a suite of DP equipment to enable the DP training provider to host courses at the venue on occasions agreed between the two parties. A DP training provider conducting courses in such a way is considered to be operating a **satellite centre**. This centre is subject to the same accreditation procedures and processes defined by The Nautical Institute for any training provider. This document details the situations in which a separate assessment is needed, and those in which the satellite centre is covered by the assessment of the parent centre.

4a DEFINITION OF A SATELLITE CENTRE

The Institute defines a satellite centre as an organisation which conducts its own training and assessment under the supervision of a larger approved centre, where the activities are conducted at one or more owned facilities located away from the primary site, and where staff follow the same practices and procedures as those of the approved centre.

4b. CLASSIFICATION OF SATELLITE CENTRES



4c. FACTORS CONSIDERED IN CLASSIFYING A SATELLITE CENTRE

The Nautical Institute may take the following factors into consideration before classifying the centre subject to audit as being unique and independent, partnership/joint-venture or a dependent satellite centre:

- Local educational regulations
- Accountability and oversight of the business (liabilities and responsibilities)
- Personnel involved and their accountability
- Administration and management for the centre's operations.

4d. INDEPENDENT AND DEPENDENT SATELLITE CENTRES

- a) If the oversight, management, accountability and operation of the satellite training centre and the user activities in the satellite facilities are INDEPENDENT of the parent company, then the satellite centre is subject to a full site visit by the DP auditors. Accreditation is given in the name of the satellite centre only and the annual DPTEG fee charged to the satellite centre.
- b) If the oversight, management, accountability and operations of the satellite training centre facilities are DEPENDENT upon the parent company and use its programmes, e.g. they share administration, mission, personnel, budget, DP equipment and technical material, then they are considered part of the accreditable parent unit. The satellite centre must be visited by at least one technical DP auditor, and the fees will be added and charged to the parent company. If administrative materials and documents are kept in the parent company, the satellite centre must present evidence of the process to access and file these documents.

When the parent company is audited, it will be subject to audit of all items related to any satellite centre that it may have. This means that the number of days needed to run the accreditation visit may increase from two to five days, depending on the number of satellite centres.

The annual DPTEG fee will be payable whether the centre is a parent centre or a satellite centre.

If the separate facilities are located some distance apart, or the oversight, management and operation of the satellite facilities are not integral to the primary unit, then the separate facilities may be considered as separate and unique accreditations. In this case, The Nautical Institute will issue the accreditation to each centre individually.

4e. JOINT VENTURES, PARTNERSHIPS AND COLLABORATIONS TO OPERATE A SATELLITE CENTRE

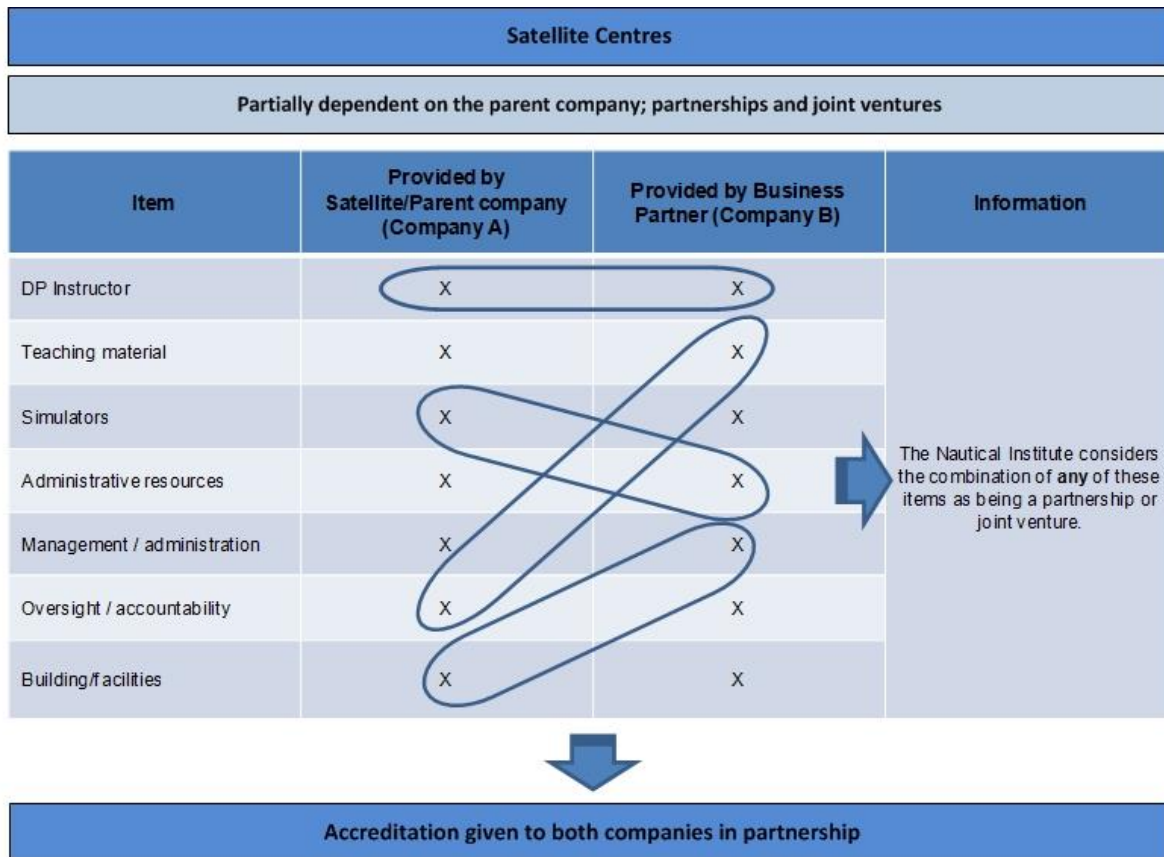
The Institute defines a joint venture as an association or contractual business undertaking between two or more individuals or companies engaged in a solitary business enterprise for profit without actual partnership or incorporation.

Joint ventures are similar to a business partnership, with one key difference: a partnership generally involves an ongoing, long-term business relationship (over 10 years), whereas a joint venture is based on a single business transaction lasting from six months to nine years. Joint ventures may be distinct business units (a new business entity may be created for the joint venture) or collaborations between businesses.

If The Nautical Institute has accredited a satellite centre as part of a joint venture, the accreditation is automatically withdrawn once the contract or agreement between the parties has been terminated.

The annual DPTEG fee will be charged to the joint venture-accredited satellite centre as well as to the fee charged to the parent centre.

The Nautical Institute will consider issuing a partnership/joint venture accreditation when there is a combination of any of the items as example below:



In the case of a partnership or joint venture, the accreditation will be given in the names of both companies. The Nautical Institute will require:

- Stamp and course certificates in the name of both companies.
- Name and signature of instructors.
- Administrative procedures showing in detail the responsibilities of each company covering registration/booking, feedback, complaint and appeal policies, annual performance indicators, control of documents, management review etc.
- Administrative staff who are aware of the Institute’s DP certification requirements and display the knowledge needed to advise prospective or current students. Evidence of compliance with course pre-requisites should be retained by the satellite centre, as should records of relevant policy and procedure covering this process. These records will be considered for audit during the re-accreditation period.
- The satellite centre must retain all copies of the documents issued for and to the DP courses for future audit or re-accreditation purposes.

Failure to comply with any Nautical Institute accreditation policy will result in suspension and possible termination of the accreditation of the partnership/joint venture.

There are some conditions and implications concerning mutual business partnerships or joint venture agreements, which may under certain circumstances compromise the standard set by the Institute for accreditation. For example, if a facility upgrades its simulator station, the training provider must ensure that the upgraded specification meets or exceeds the minimum specification defined by the Institute and that the Institute is made aware of this upgrade before the change takes place.

The Nautical Institute will therefore wish to ensure that the terms and conditions of the business partnership and/or joint venture agreement uphold as a minimum the Institute accreditation requirements. In satisfying itself of this matter, The Nautical Institute exercises no particular interest in any personal, financial or other

type of sensitive data contained in such an agreement and accepts that this may be censored for commercial reasons.

TRAINING STANDARD

Accreditation is given for both the Induction course and the Simulator course together. When a training centre applies for accreditation it must submit all required materials for both courses.

5a. PRE-REQUISITES TO ENTER THE NI DP TRAINING SCHEME

5a(i). MINIMUM QUALIFICATION REQUIREMENT

The minimum STCW qualification that a person wishing to enter The Nautical Institute DP Training Scheme must hold is

- Regulation II/1 - II/2 - II/3 Deck or
- Regulation III/1 – III /2 – III/3 Engine or
- Regulation III/6 ETO

Alternative appropriate marine vocational qualifications (MVQs) will be considered on a case by case basis. The Institute defines an MVQ as *a non-STCW Certificate of Competency issued by a white list Maritime Administration for use in the administration's local waters only.*

Due to the fact that there are countries that have Certificates of Proficiency instead of Competence and that cover training for non-STCW people, the Institute will print all DP certificates with the following sentence:

Certificate valid for use in accordance with the privileges of the holder's Certificate of Competence or Certificate of Proficiency.

5a(ii). OFFICER TRAINEES (Cadets or ratings on a defined training programme)

Prospective Offshore DPOs on the new scheme who are in the process of training for an STCW certificate may complete Phase A, the Induction course, the 60 days DP sea time of Phase B and Phase C, the Simulator course. The remaining DP sea time training can only be completed after they hold an appropriate STCW Certificate of Competency.

Cadets are not allowed to claim for Sea Time Reduction (STR) in phase D of the training scheme.

These rules are effective from 1st January 2016 and apply to those who have already commenced training on the new scheme as well as new starters.

There are currently no changes to the requirements for Cadets on the Shuttle Tanker Scheme or those on the old Offshore Scheme.

Note that the time to complete the training scheme for those who started the Induction course after 1 January 2015 is four years.

Centres should keep electronic copies of students' documentation for audit purposes as well as for reference should any questions arise at a later stage in the student's application process.

Prospective DPOs who are not Officer Trainees and thus not meeting the above requirements will be able to apply for certification if they commenced training prior to the implementation date (1 January 2012) and all elements have been completed within a five-year period at the time of application.

5a(iii) NAVAL OFFICERS AND ENTRY REQUIREMENTS

Naval Officers with appropriate watch keeping qualifications may commence DP scheme without pre approval from the Nautical Institute. It is recommended however that training centres check the qualifications with the Nautical Institute in case any clarification is required.

MARINE VOCATIONAL QUALIFICATION (MVQ): Before starting the Induction course, the candidate shall present his/her documents to the training centre. If these do not meet the minimum requirements as set out in this document, they will advise the candidate to contact The Nautical Institute for official approval to attend the course. The candidate shall provide a copy of the documents of proficiency and/or any other relevant document as evidence of qualification. The Institute will assess those and may or may not issue an authorisation letter to the candidate to start the course. This procedure shall be done before the candidate starts the Induction course.

STCW CERTIFICATE OF COMPETENCE: Training centres are required to ask for and keep a copy of the Certificate of Competence of their students before accepting them onto the DP Induction course and DP scheme. The Certificate of Competence number should be noted and properly recorded by the centre in the student record as well as in the logbook provided to them. The Nautical Institute will require a copy of the Certificate of Competence when receiving their application to cross-check the information.

OFFICER TRAINEES: Officer trainees (cadets or ratings on a defined training programme) should present proof, such as a letter from the company employing them or the college indicating that they are on STCW training, before joining the Induction course and should be instructed by the training centre that they are not able to undertake the Simulator course and remaining DP sea time days until they hold a STCW Certificate of Competency.

5b. TRAINING METHODOLOGY

See APPENDIX B

5c. INSTRUCTOR REQUIREMENTS

Instructors or instruction teams shall meet the requirements contained in APPENDIX C – INSTRUCTOR REQUIREMENTS.

5d. CLASSROOM REQUIREMENTS

See APPENDIX D - DP CLASSROOM REQUIREMENTS.

5e. SIMULATOR/EQUIPMENT REQUIREMENTS

See APPENDIX E - NI DP SIMULATOR/EQUIPMENT SPECIFICATIONS.

5f. INSTRUCTION MANUALS

5f(i) INSTRUCTOR'S MANUAL

Each course must be supported by an Instructors' manual. The purpose of this manual is to provide a means of tracking changes to the documentation used in delivering training, to provide a reference for all trainers at a particular centre to train to the same standard and to act as an induction tool when new instructors join the centre.

The Instructor's manual for each course should contain as a minimum:

- A statement of the centre's teaching methodology (for guidance see APPENDIX B)
- Course overview and purpose
- Course aims and objectives
- Course timetable with breakdown of time assigned for each module and coffee/lunch breaks
- Details of the simulator equipment used for the course including a plan of the simulator layout
- Materials and other equipment required for each course module
- Copies of slide presentations
- Copies of student handouts
- The model the centre uses for planning a simulator exercise (see APPENDIX B for an example)
- Lesson plans for each module and exercise (see APPENDIX B for an example) with the objectives to be achieved by the exercise stated
- Practical exercises (both student and instructor versions)
- Explanation of the centre's assessment system including master copies of the form/forms that will be used to provide written evidence of each student's performance on individual simulator exercises and for the course overall

In most cases training organisations hold copyright of their training materials and prefer to have control of all manuals on site. The Institute supports this approach and requires at least one controlled **master copy of the Instructor's manual** for each course taught should be maintained by the Centre Coordinator. This master copy may be kept electronically.

5f(ii) STUDENT MANUAL

The Student manual for each course should contain as a minimum:

- Course overview and purpose
- Course timetable
- Course aims, objectives and competencies
- Explanation of how they will be assessed
- Health and safety information for the particular centre
- Complaint/appeal procedure

Centres are encouraged to make some/all of the manual available to students digitally. At least one controlled **master copy of the Student manual** for each course taught should be maintained by the Centre Coordinator. This master copy may be kept electronically

It is suggested that the material given to students also contain examples of DP incidents which have occurred as well as an overview of The Nautical Institute DP Operator certification process and information/links to relevant industry websites (IADC, ICS, IMCA, ISOA, OCIMF, IDPOA, STATOIL).

Note: Instructor and student's manuals shall have date and version as part of quality management system and document control (Appendix F)

5g. DP SEA TIME OBTAINED PRIOR TO THE INDUCTION COURSE

Trainee DPOs attending an Induction course after 1 January 2015 will only be permitted to count DP sea time gained after attending the course when they make their online DP Operator certificate application. Applications received under the old scheme rules at The Nautical Institute headquarters will be evaluated and honoured by the previous regulation.

5h. INDUCTION COURSE

5h(i) NUMBER OF HOURS

A minimum of 28 hours teaching time is required for this course; if additional time is required to run exams or deal with paperwork, this time shall be added to the 28 hours. It is recommended that 80% of the time is spent on teaching DP theory and 20% on practical exercises.

Conventionally the Induction course is delivered over four or five days. There is the option to deliver the course over a maximum six-week period, with the instruction taking place on a given day in each of those weeks. This option is particularly suited to cadet training institutions as it allows the training to fit into the already existing class schedule. In all other aspects the course must conform to all other training scheme standards.

5h(ii) RATIO OF STUDENTS/INSTRUCTORS/EQUIPMENT

The number of students attending the Induction course must be regulated such that each student obtains sufficient 'hands-on' experience of operating the system to ensure adequate familiarisation with the principles of DP operation. In order to achieve this, the Institute allows a maximum of eight students per class being taught by one instructor. If more than eight students are enrolled on the course, a second instructor will be required to assist with practical exercises. In this case, the name and signature of the second instructor should be reflected in the attendance list of the course and practical exercises.

Regarding the availability of equipment and keeping in mind the goal of sufficient 'hands-on' experience, a centre is allowed to seat two students per DP console, although this is not fully recommended. In this case, the ratio for the Induction course is

One instructor for eight students and four DP consoles

5h(iii) DELIVERY METHOD

At the start of the Induction course The Nautical Institute DP Operator Training Scheme will be outlined, including maintenance of the logbook and the procedure for obtaining a DP Operator certificate.

The Induction course will be predominantly theory based with guided practical exercises that introduce the trainee to various DP operational modes. The topics to be covered on the Induction course will include:

- General principles of dynamic positioning.
- The elements of a DP system:
 - i. Computers and control elements
 - ii. Position reference systems
 - iii. Heading reference systems
 - iv. Wind sensors and other environment reference systems
 - v. Power generation elements. The UPS
 - vi. Thrusters and manoeuvring systems

- Position reference systems and other sensors; their principles of operation, their use, operational merits and limitations.
- Practical demonstration and operation of a typical DP system.
- DP vessel operations. Hazards associated with certain types of operation, e.g. shallow water and strong tides.
- Power generation, distribution and management.
- DP watch keeping and watch handover procedures. Documentation. Communications.

The practical elements of this course will entail the use of a DP system installed in the training centre and delivered with an adequate level of simulation. This equipment must meet the requirements set out in APPENDIX E - NI DP SIMULATOR/EQUIPMENT SPECIFICATIONS. The minimum equipment required for the Induction course is Class C simulators

5h(iv) COURSE AIMS

At the end of the course the student should:

- Have acquired knowledge of the principles of DP.
- Have acquired a basic understanding of how to set up a DP system.
- Have an understanding of the practical operation of associated equipment, including position reference systems.
- Be able to recognise the various alarm, warning and information messages.
- Be able to relate the DP installation to the ship system, including (but not limited to) power supply, manoeuvring facility, available position reference systems and nature of work.
- Be able to relate DP operations to the existing environmental conditions of wind, sea state, current/tidal stream and vessel movement.

5h(v) COURSE OBJECTIVES

The following is a list of the objectives which should be attained by trainee DPOs by the completion of the Induction course.

All objective statements are assumed to be preceded by the words: *By the completion of the training session or period, the trainee should be able to:*

DP CONTROL STATION

1. Define Dynamic Positioning.
2. Explain the need for Dynamic Positioning in various types of vessel.
3. Describe the six freedoms of movement of a vessel.
4. State which of the six freedoms of movement are controlled under DP and which are monitored.
5. Describe the following aids to manoeuvring commonly fitted to DP vessels, including their practical and operational advantages and disadvantages: fixed and controllable-pitch propellers, azimuth thrusters, Azipod thrusters and tunnel thrusters.
6. List the seven main components of a DP system; DP operator, DP computer (or controller), DP operator station, position reference systems, sensors, power supply and thrusters.
- 7 Describe the various modes of DP operation, including manual control, semiautomatic control and automatic control. In addition, describe the following common specialist functions: ROV follow (follow sub), follow target, track follow (autotrack), minimum power (weathervane) and riser angle mode.
8. Discuss the concept of mathematical modelling of vessel behaviour characteristics and appreciate the advantages and limitations/disadvantages of this technique.

9. Outline the power requirements of a DP vessel system and describe a typical diesel-electric power installation.
10. Describe the following position reference systems commonly associated with DP installations: Differential GNSS, hydroacoustic, taut wire, Artemis, FMCW Radar and laser-based systems.
11. Describe the following sensors associated with DP installations: vertical reference sensor/unit, motion reference unit, gyro compass, wind sensor (anemometer) and manual draught input sensor.
12. Describe the concept of centre of rotation and the provision of alternative centres of rotation.
13. Describe consequence analysis as carried out by a Dynamic Positioning system.

POWER GENERATION AND MANAGEMENT

14. Describe the power generation and distribution arrangements in a typical diesel-electric DP vessel, with particular reference to system redundancy as described in IMO MSC Circ. 645 and vessel FMEA.
15. Describe the power supply and distribution arrangements in a typical hybrid diesel/diesel-electric DP vessel. (Main CPP or Az drive which are direct drive)
16. Recognise the power requirements of DP vessels and explain the concept of available power and spinning reserve in worst case failure.
17. Describe the functions of a power management system as installed on Class 2 and Class 3 DP vessels.
18. Describe the provision of uninterruptible power supply to the DP system, with particular reference to power shortages, failures and system redundancy.

PROPULSION UNITS

19. Describe the following types of propulsion system commonly installed in DP equipped vessels: main propellers and rudders, azimuth thrusters, Azipod thrusters and tunnel thrusters
20. Describe the importance of monitoring the displayed values of setpoint and feedback data for thruster and propeller rpm, pitch and/or azimuth.
21. Describe the operational characteristics and common failure modes of the different types of propulsion systems as described in 19 above.

POSITION REFERENCE SYSTEMS (PRS)

22. Describe the operation of hydroacoustic position reference (HPR) systems.
23. Describe the principles of position-fixing using underwater acoustic systems working in SSBL/USBL, LBL and SBL modes.
24. Describe the various types of hydroacoustic beacon: transponder, responder and pinger.
25. Describe the layout of a typical HPR system including operator station, transceiver, HPR pole and transducer.
26. List the operational advantages and limitations of acoustic systems as a position reference for DP.
27. Describe the principle and operation of the Artemis position reference system.
28. List the operational advantages and limitations of the Artemis position reference system.
29. List the different types of taut wire position reference system: vertical lightweight, vertical deep water, vertical moon pool, horizontal and horizontal gangway.
30. Describe the display of taut wire reference data in the DP system.
31. Describe the principle of position reference using the taut wire system.
32. List the advantages and limitations of the taut wire position reference systems.
33. Describe the principles of the Differential GNSS (DGNSS) system.
34. Outline the operation of a typical commercial DGNSS network where corrections are delivered by satellite communications.
35. List the sources of error and inaccuracy associated with the DGNSS system, describing the effects on the quality of positioning.
36. List the available quality data associated with the DGNSS system.

37. List the advantages and limitations of the DGNSS system when compared with other PRS.
38. Describe the principles used in relative DGNSS systems.
39. Describe the principles of position reference using laser-based systems.
40. Outline the method of setting up a laser system to provide best position information.
41. List the advantages and limitations associated with a laser-based PRS.
42. Describe the principles of position reference using FMCW Radar-based systems.
43. List the advantages and limitations associated with FMCW Radar-based PRS.
44. Describe the principle of Inertial Navigation (INS) and the methods of using INS to enhance existing PRS performance.
45. Discuss the relative accuracy and reliability of the aforementioned PRS, together with the methods used to apply weighting and pooling and voting when more than one PRS is used. Median rejection of PRS when three or more are used and the importance of monitoring the position reference page.
46. Describe other PRS that may be used in conjunction with a DP system.

HEADING AND MOTION REFERENCE SYSTEMS

47. Describe the function of gyro compasses and their redundancy within a DP system.
48. Describe how to obtain pitch, roll and heave information for input into a DP system.
49. Describe the reason for inputting pitch, roll and heave into a DP system.

ENVIRONMENTAL REFERENCE SYSTEMS

50. Describe the provision of wind sensors within the DP system.
51. Describe the wind feed-forward facility and its importance within the DP system.
52. Recognise the limitations of wind sensor inputs. Explain the reasons for and the consequences of deselecting wind sensor inputs.
53. Describe the method by which the DP system determines the value for DP current or Sea Force (the residual error resulting from unmeasured errors & unmeasured forces acting on the vessel).
54. List the reasons for discrepancy between the displayed value of DP current (or Sea Force) on the DP system and the true current or tidal stream value.

EXTERNAL FORCE REFERENCE SYSTEMS

55. Describe the use of external force reference systems such as hawser tension, plough cable tension and pipe tension monitoring.

DP OPERATIONS

56. Describe the procedures to be followed when approaching a worksite and transferring from conventional navigation to DP control.
57. Discuss the need for completing pre-DP and other checklists prior to and during DP operations.
58. Explain the need for keeping logbook records of all DP operations, failures and incidents.
59. Explain the need for keeping records of operation, maintenance and repairs of DP and ancillary equipment.
60. Describe the need for effective communications during the conduct of DP operations.
61. Outline the procedures to be followed by the DPO when taking over the control of the vessel's positioning and manoeuvring.
62. Describe the alarm messages provided on the DP system displays and on the DP printer.
63. Recognise the alarms/warnings associated with loss of redundancy after worst case failure and the possible loss of heading or position if another failure occurs after a worst case failure (part loss of some thrusters and power) and catastrophic failure (loss of heading and/or position control).
64. Outline the navigational projections, spheroids and datums that may be used in operations involving Dynamic Positioning.
65. Explain the use of worksite diagrams using Universal Transverse Mercator (UTM) coordinates.

66. Explain the need for planning DP operations, including emergency and contingency situations.
67. List the various providers of documents containing statutory requirements and guidance relating to DP operations, including:
- a. IMO (including IMO MSC/Circ. 645 of 1994 *Guidelines for Vessels with Dynamic Positioning Systems*)
 - b. Classification society DP rules
 - c. International Marine Contractors Association (IMCA)
 - d. Marine Technology Society (MTS)
68. Explain the purpose of documentation associated with DP operations, such as DP operations manuals, Failure Modes and Effects Analysis (FMEA) and capability plots.
69. Describe the IMO (DP) equipment classes and their application, with reference to the IMO *Guidelines for Vessels with DP Systems*.
70. Understand that classification societies use either numbers (eg ABS DPS-2) or letters {eg Lloyd's Register DP (AA)} to denote the DP class allocated to the vessel.
71. Describe in outline the DP operations conducted by the following vessel types:
- a. Diving and underwater support vessels
 - b. Drilling ships and semi-submersibles
 - c. Cable lay and repair vessels
 - d. Pipelay vessels
 - e. Rock dumping and dredging vessels
 - f. Shuttle tanker and FPSO/FSO operations
 - g. Flotel (accommodation) vessels
 - h. Crane barges and construction vessels
 - i. Anchor-handling and platform supply vessels
 - j. Cruise ships and luxury yachts
72. State and describe the hazards associated with DP operations conducted in areas of shallow water and/or strong tidal conditions.
73. Describe the hazards associated with DP operations in very deep water.

PRACTICAL OPERATION OF A DP SYSTEM

74. Demonstrate the use of the joystick to manoeuvre the vessel and bring the vessel to a stop in a seamanlike manner.
75. Demonstrate the correct procedure for setting up the DP system in both manual and automatic modes.
76. Demonstrate position and heading change manoeuvres, using both automatic and manual DP facilities.
77. Demonstrate commonly provided functions on the DP control panel including Gain, Fixed Azimuth mode and Thruster bias.
78. Demonstrate the use of common facilities found on a DP system, eg Track Follow, Minimum Power and ROV Follow.

5h(vi) ONLINE ASSESSMENT

In order to be awarded a certificate of completion for the Induction course the trainee must pass an online assessment at the training centre. The exam is composed of multiple choice questions and shall be completed in 1 hour and 15 minutes. Students who fail the first attempt are allowed to have another two attempts within six months of the first attempt; however, the second attempt must be undertaken within 24 hours of the first attempt. Failing these three initial attempts, the student is required to repeat the Induction course and undertake the assessment.

On successful completion of the Induction course and online assessment, the trainee Dynamic Positioning Operator will be issued with a Nautical Institute Dynamic Positioning Operator's logbook in which his/her

courses, DP sea time, task completion and Statement of Suitability as a DPO are recorded.

Operational guidance about issuing or replacing logbooks can be found at NI circulars and in the NI guidelines. These documents are sent to the training provider once the initial accreditation is agreed.

5h(vii) BLENDED LEARNING – FOR INDUCTION COURSE ONLY

Definitions:

- CBT: a computer course that completely replaces face-to-face training.
- Blended learning: a methodology that combines CBT with face-to-face and/or practical training.

CBT courses are not recommended for DP courses because the trainee DPO must learn skills that cannot be taught via computer only: communication, delegation, emergency response, etc. Trainee DP operators learn from each other during a face-to-face course as they participate in discussions and debrief after exercises.

Blended learning can be accepted as a delivery method for the DP Induction course only, not the Simulator course. CBT may be used to deliver the theoretical portion of the Induction course after which a minimum of 2.5 days will be required in a traditional class. At least two full days should be used for exercises, not theory, and 0.5 days should be used to administer the external online assessment.

The course aims and objectives must comply with those in 5h(iv) and 5h(v) above and shall be assessed by The Nautical Institute on a case by case basis.

During the CBT portion of the course, computer assessments for each unit of material covered will be administered to verify that the trainee understands that material. The pass mark will be 70% for these interim assessments. Once the CBT is complete, the training centre shall administer a further assessment to ensure that the trainee is ready for the practical portion of the course and is at a level of understanding aligned with other trainees in the class.

A hard copy of the materials should be also handed over to student to complement the CBT portion of the blended learning.

One instructor should be allocated to support each student and support should be given seven days a week and cover all parts of the world.

5i. SIMULATOR COURSE

5i(i) NUMBER OF HOURS

A minimum of 28 hours teaching time is required for this course; if additional time is required to deal with paperwork or administer exams this time shall be added to the 28 hours. It is recommended that a maximum of 20% of the course time is spent on theory and a minimum of 80% on practical exercises.

5i(ii) RATIO OF STUDENTS/INSTRUCTORS/EQUIPMENT

The number of students attending the Simulator course must be regulated such that each student obtains sufficient 'hands-on' experience of operating the system when having to react to various failure scenarios.

In order to achieve this, the Institute allows a maximum of four students per class being taught by one instructor per one Class B or A simulator.

By exception and where justified, five or six students may be considered at the discretion of the Institute's Accreditation Team, based on the number of simulators in place, rotation of students and the use of the training methodology in place.

It was also recognised that when two simulator systems were available in a training centre, that "best practice" was to keep the trainee on the same simulator throughout the simulator course.

5i(iii) DELIVERY METHOD

The training will be predominantly practical/operational in nature. Exercises and case studies will be carried out in a facility that meets the provisions set out in the document NI DP Simulator specification (Appendix E).

In addition to exercise briefing/debriefing, students will be given an opportunity to give feedback on their training needs during classroom tuition.

This course is intended for those who have completed the Induction course and a minimum of 60 days DP sea time. These officers should already have a good grounding in the practice and principles of dynamic positioning through their experiences in class and at sea.

The DP Simulator course is intended to build on that experience, and to provide some realistic DP-based scenario work. These scenarios should provide the opportunity to practise all aspects of the planning and conduct of typical DP operations, including the handling of emergencies. Particular emphasis should be placed upon teamwork within the role-play scenarios.

A typical installation will consist of a redundant DP system interfaced with a simulator system co-ordinated by the instructor's input. Other facilities will include a realistic communications suite, suitable chartroom facilities and support documentation.

DP scenarios must closely match the situation onboard a vessel. Communications form an important part of any DP situation; thus they must be adequately simulated in any training facility, with several different means of communication between the instructor station and the DPO/trainee facility. Communications to be simulated include:

- VHF on emergency and working channels. A useful addition is a listing of the various channels monitored by the various installations and vessels taking part in the simulations.
- Talk-back to areas such as ROV control, dive control.
- Telephone to areas such as the MCR.
- DP status alarms (red, amber, green traffic light plus a white/blue light for drill operations).
- DP status board. This facility may form part of a planned crisis; the instructor may mark up the status board incorrectly at the beginning of a scenario to discover if the trainees are completing their checklists meticulously.

The training establishment will need to provide materials to support the hardware simulator facility. This will mainly consist of a variety of documentation. The range of documentation will include:

- Plans and drawings showing the oilfield or operating area in use in the simulations.
- Drawings of the various installations within the operating areas, together with any specifications or other details necessary.
- Drawings and data sheets relating to the vessel or vessels under simulation; these drawings to include DP capability plots.
- Operational instructions, checklists and standing orders associated with the vessel or vessels.
- A set of scenario information sheets. Each scenario should be designed to provide at least one specific, planned crisis or problem for the trainees to react to. Other problem areas should be kept 'in hand' for use in the event of the trainees coping with the primary planned crisis in short order.

5i(iv) COURSE AIMS

On completion of the simulator course the student should be able to:

- Carry out operational planning, risk assessment and hazard identification tasks
- Set up the DP system for a particular task
- Operate the communications
- Analyse the trends
- Discuss systems failures
- Decide on courses of action because of systems failures
- React to alarms and printer readout
- Initiate DP Alert status alarms
- React to all events occurring
- Operate the desk under normal and pressured conditions
- Practice effective teamwork
- Apply the lessons learned to date

5i(v) COURSE OBJECTIVES

1. OPERATION OF A DP SYSTEM

1.1 Demonstrate ability through participation in exercises to set up, operate and carry out manoeuvres using the DP system under the following control modes by:

Manual mode	(joystick control of surge, sway and yaw)
Mixed manual/automatic mode	(automatic control of yaw with joystick control of surge and sway) (automatic control of surge and sway with joystick control of yaw)
Automatic mode	(automatic control of surge, sway and yaw)
Track follow mode	
Minimum power heading mode	
Follow-target mode	(ROV follow and working other DP vessels)

1.2 Demonstrate within the DP simulator the operation of position reference systems, sensors and peripheral equipment associated with the DP system.

2. DP OPERATION

- 2.1 Interpret vessel plans and specifications, capability diagrams and other data, such as paper chart or electronic field charts relevant to the planning and conduct of DP operations.
- 2.2 Using vessel and other data such as capability plots (paper or electronic), assess the capability of the vessel to complete successfully any proposed operation and not to have a loss of position after worst case failure.
- 2.3 Carry out a risk assessment exercise on proposed operations and determine the level of redundancy appropriate. Create an alert light table with what will trigger a green, yellow, red or white status and the action required.
- 2.4 Make appropriate contingency plans to cover any foreseeable system failure or operational requirement. Contingency planning to include appropriate 'escape routes' for the vessel.
- 2.5 Demonstrate compliance with appropriate procedures to be followed when approaching any work site and transferring from conventional vessel control* to DP control.
*using the joystick on the DP console to control vessel movement before entering full automatic DP mode.
- 2.6 Demonstrate effective completion of pre-DP, setup and change of watch and other checklists.
- 2.7 Demonstrate the effective communication needed during DP operations and the testing procedures. Here effective communications dictates the need for communications equipment in the simulation standard.
- 2.8 Conduct vessel positioning manoeuvres and station keeping functions following operational plan and procedures.
- 2.9 Organise DP watchkeeping procedures observing recognised safe working practices.
- 2.10 Conduct appropriate watch handover procedures, completing appropriate checklists.
- 2.11 Maintain the appropriate logbooks and records pertaining to DP operations.
- 2.12 Evaluate the various information, warning and alarm messages communicated to the operator.
- 2.13 Relate the content of the messages in 2.12 above to the actions necessary in relation to the DP operation.

3. EMERGENCY PROCEDURES

- 3.1 Recognise the conditions that will cause degraded operational status or emergency status.
- 3.2 Recognise the warnings and alarms associated with catastrophic failure. Worst case failure.
- 3.3 Evaluate the various factors to be taken into account subsequent to any system failure and determine appropriate actions.
- 3.4 Carry out procedures to stabilise the vessel position and heading subsequent to a variety of system failures and take appropriate decisions and actions relating to the continuance or abandonment of the operation. This to include the following:
 - a) Thruster fail to max pitch.
 - b) Setpoint/feedback offset.
 - c) Loss of all position reference systems, entering move into DP system when in DR mode.
 - d) Worst case failure and action to be taken.
 - e) Movement of position reference systems

5i(vi) FAILURE MODE CHECKLIST – As per APPENDIX J (ref)

5j. SEA TIME REDUCTION COURSE (STR)

5j(i) NUMBER OF HOURS

A minimum of 37.5 hours of instruction time is required for this course.

5j(ii) RATIO OF STUDENTS/INSTRUCTORS/EQUIPMENT

The number of students attending a STR course must be regulated such that each student obtains the maximum amount of 'hands-on' experience of operating the system to ensure the validity of awarding six days DP sea time for each day spent in the simulator. In order to achieve this, The Nautical Institute allows a maximum of three students per class being taught by one instructor in a Class A simulator.

5j(iii) DELIVERY METHOD

The training will be predominantly practical/operational in nature.

In addition to the opportunities that arise during exercise briefing and debriefing sessions, provision will be made during classroom tuition to facilitate student feedback of training needs.

Exercise scenarios and case studies will be carried out on a facility that effectively replicates the working environment the trainee will meet onboard. Simulator equipment for the DP Sea Time Reduction training should incorporate facilities that:

- Create a real time operating environment that includes navigation control, manoeuvring and communications instruments replicating that found on a typical dynamically controlled vessel, that will allow trainees to carry out DP watchkeeping and station keeping tasks
- Provide a realistic visual scenario by day and night, including variable visibility, with a minimum horizontal and vertical field of view in viewing sectors appropriate to the DP watchkeeping and station keeping tasks
- Realistically simulate 'own ship' dynamics in open water conditions, including the effects of weather, tidal stream, shallow water and interaction with other vessels
- Realistically simulate faults in the dynamic positioning control system, power generation and distribution systems, propulsion systems, position reference equipment, other sensor equipment and the machine/human interface

5j(iv) COURSE AIMS

The Sea Time Reduction course should be an opportunity for the trainee to spend extended and intense periods of time on DP station keeping and should challenge the trainee to enhance, consolidate and demonstrate

- their knowledge of the DP system and additional equipment and instruments,
- their situational awareness,
- their communication and teamwork skills,
- their ability to analyse trends and pre-empt problems before they arise,
- their ability to evaluate and respond to alarms, faults and emergencies with calm, reason and confidence, and
- their ability to complete such administrative and safety-related procedures as completing checklists, filling in logs and performing thorough watch handovers.

The range of exercises a centre develops to achieve these aims should be appropriate to the intended target group. The following are examples of the typical operational areas that should be considered:

- Saturation and air dive support

- Sub-sea construction and heavy lift
- ROV operations
- OSV operations
- Cable and pipe laying operations
- Drilling operations
- Offshore loading operations
- Shuttle tanker

5j(v) COURSE OBJECTIVES

1. OPERATION OF A DP SYSTEM

- 1.1 Demonstrate the ability to set up and operate the DP system under the various control modes, and to carry out manual, mixed manual and automatic and fully automatic manoeuvres.
- 1.2 Demonstrate within the DP simulator the operation of position reference systems, sensors and peripheral equipment associated with the DP system.

2. DP OPERATION

- 2.1 Interpret vessel plans and specifications, capability diagrams and other data relevant to the planning and conduct of DP operations.
- 2.2 Using vessel and other data, assess the capability of the vessel to complete successfully any proposed operation.
- 2.3 Carry out a risk assessment exercise on proposed operations and determine the level of redundancy appropriate.
- 2.4 Make appropriate contingency plans to cover any foreseeable system failure or operational requirement. Contingency planning to include appropriate 'escape routes' for the vessel.
- 2.5 Demonstrate compliance with appropriate procedures to be followed when approaching any work site and transferring from conventional vessel control to DP control.
- 2.6 Demonstrate effective completion of pre-DP and other checklists.
- 2.7 Demonstrate the effective communications necessary during DP operations and the testing procedures.
- 2.8 Conduct vessel positioning manoeuvres and station keeping functions following operational plan and procedures.
- 2.9 Organise DP watchkeeping procedures observing recognised safe working practices.
- 2.10 Conduct appropriate watch handover procedures, completing appropriate checklists.
- 2.11 Maintain the appropriate logbooks and records pertaining to DP operations.
- 2.12 Evaluate the various information, warning and alarm messages communicated to the operator.
- 2.13 Relate the content of the messages in 2.12 above to the actions necessary in relation to the DP operation.

3. EMERGENCY PROCEDURES

- 3.1 Recognise the conditions that will cause degraded operational status or emergency status.
- 3.2 Recognise the warnings and alarms associated with worst case failure.
- 3.3 Evaluate the various factors to be taken into account subsequent to any system failure and determine appropriate actions.
- 3.4 Carry out procedures to stabilise the vessel position and heading subsequent to a variety of system failures and take appropriate decisions and actions relating to the continuance or abandonment of the operation. This to include the following:
- a) Thruster fail to max pitch
 - b) Setpoint/feedback offset
 - c) Loss of all position reference system, entering move into DP system when in DR mode
 - d) Worst case failure and action to be taken

e) Movement of position reference systems.

In 2.2 above, one exercise should be in the form of a tabletop analysis. An FMEA should be used along with other appropriate documentation to evaluate a vessels capability to carry out a given operation.

5j(vi). FAILURE MODE CHECKLIST – as per APPENDIX J (ref)

5j(vii). COUNTING STR TRAINING TOWARDS REQUIRED DP SEA TIME

The required period of 60 days supervised DP sea time after the Simulator course may be reduced by a maximum of 30 days upon the satisfactory completion of an intensive DP simulator training course (STR).

This intensive DP simulator training course can be done straight after the Simulator course. The trainee DPO is then required to do a minimum of 30 days DP sea time aboard a class 2 or 3 DP vessel and have the Statement of Suitability signed by the Master. A company confirmation letter is required for verification of that DP sea time.

As with the other components of the scheme, all DP time or courses leading to reduction of DP time must have been completed within the previous four years.

SHUTTLE TANKER TRAINING SCHEME

6a. GENERAL OVERVIEW

Shuttle Tanker DP certification shall cover all classes 1, 2 and 3 of DP shuttle tankers.

The existing concept of the DP Induction simulator course and then some practical experience, followed by a DP Simulator course as the precursor to a practical training regime is well proven, and needs little change – except for some additional shuttle tanker specific tasks as an amendment/supplement to the DP Training logbook (see Task section).

A mix thereafter of practical experience and further simulator training, including the use of shuttle tanker operation specific simulations, e.g. Offshore Loading Course Phase 2 is a good example of the type of simulations expected. The practical DP sea time should be based on the number of complete offshore loading operations experienced, rather than the number of DP days only. A regime of time onboard the shuttle tanker is expected as the trainee will be in an environment where questions can be asked of experienced DPOs and equipment studied independently to try and help consolidate the training course learning.

The shuttle tanker vessel Master and the vessel operating company are to both confirm the trainee's practical experience and understanding being satisfactory in the same manner as the current application process. This should help 'validate' logbook entries as the vessel operator will be heavily involved in oversight and planning of the DPO training programme. The proposed qualification programme, being focused on practical experience, may (if managed properly) effectively restrict the number of trainees that can be trained onboard at any one time, but should help to ensure the quality of the training experience.

6b. TRAINING PROCESS LEVELS

PHASE 1: DP Induction course

PHASE 2: Minimum of 24 days sea time as practical time onboard a shuttle tanker with participation in at least two complete offshore loading operations (field arrival, set-up approach, connection, loading, disconnection and departure). Both criteria must be achieved, i.e. if the person completes only one offshore loading operation within 24 days, it will be required for the trainee to undertake more sea time until he/she completes the one missed offshore loading operation as required.

During this period, the Task section entries should be completed to ensure that a good knowledge of DP operations is achieved prior to attending the DP Simulator course.

The attention of operators and Masters is drawn to this Task sections expectation and it is recommended that trainee DPOs have few other duties during this period to ensure that they have the opportunity to meet these guidelines.

PHASE 3: DP Simulator course to help consolidate general DP theory and understanding.

PHASE 4: Minimum of 24 days sea time as practical time onboard a shuttle tanker with participation in at least two complete offshore loading operations (field arrival, set-up approach, connection, loading, disconnection and departure). Both criteria to be achieved.

PHASE 5: Training course (one of A, B or C described further in this document)

PHASE 6: Minimum of 24 days sea time as practical time onboard a shuttle tanker, with participation in at least two complete offshore loading operations (field arrival, set-up approach, connection, loading, disconnection and departure.) Both criteria to be achieved.

PHASE 7: Training course (one of A, B or C not already completed)

PHASE 8: Minimum of 24 days sea time as practical time onboard a shuttle tanker with participation in at least two complete offshore loading operations (field arrival, set-up approach, connection, loading, disconnection and departure). Both criteria to be achieved.

Phase 9: Training course (one of A, B or C not already completed during the training)

PHASE 10: Minimum of 24 days sea time as practical time onboard a shuttle tanker with participation in at least two complete offshore loading operations (field arrival, set-up approach, connection, loading, disconnection and departure). Both criteria to be achieved.

PHASE 11: Upon the satisfactory assessment of performance, submission of application to The Nautical Institute for Shuttle Tanker DPO certificate, with appropriate confirmations and details from the Master and company that the training regime has been complied with. Training book and logbook entries to specify location and type of installations experienced.

This gives an aggregate minimum 120 days onboard and minimum 10 loading operations as the pre-certification practical experience, which should be equitable for any future move to upgrade to General DP certification. Each 'practical experience' stage must comply with 24 days onboard and two complete loading operations – whichever limit is reached last. There is no option for any sea time reduction within this programme, i.e. the Sea Time Reduction and Offshore loading courses will not reduce the sea time required, but will be counted for training purposes only.

Note about shuttle tanker DP operations – offshore loading operations not conducted with the DP system in use shall not be counted as offshore loading operations within the Training and Certification scheme.

6c. COURSES A, B AND C

Courses A, B, and C can be taken in any order but may not be moved from their position order of training, respecting the minimum amount of DP sea time required between them. These courses are based on:

6c(i) COURSE A:

Completion of appropriate position reference systems training course (Artemis, DARPS, HPR, and others such as Radius or Fanbeam). To be formal training delivered by recognised reference system's manufacturers of equipment or their approved agent.

Capacity: 10 students

Number of hours: from one to two day course with minimum of six hours per day.

At the end of the course, the trainee should obtain a certificate of attendance. As there is no requirement to revalidate or refresh this course, the four year rule does not apply to this phase/course.

The Nautical Institute only recognises these courses rather than accredits them. Courses should be aligned with existing practices in regards to course duration as below:

Artemis operator course: 1 day

HRP/HiPAP operator course: 2 days
DGPS/DARPS operator course: 2 days
Parker PMS System Operator course: 1 day

6c(ii) COURSE B:

Shuttle tanker operations simulator training course referent to Offshore loading Phase 2 type course. To concentrate on shuttle tanker specific behaviours and include a range of offshore loading installation types.

Capacity: Three students maximum

- Duration: Five days x six hours per day, totalling 30 hours
- Simulator: This course is done on simulator Class A only.
- Purpose

The focus of the exercises should be on the practical handling of shuttle tankers in the vicinity of offshore installations. This should include approach to the operational zones, safe interaction with the offshore terminal facilities, including the effects of mooring systems, hose connections, emergency shutdowns, interaction with tanker assist vessels and field communications. All functions of propulsion, power generation and position reference systems should be included in the discussions and exercises, as well as effects and instances of equipment and system errors/failures. Students will also acquire knowledge of offtake tanker operational procedures.

A separate basic ship handling course should have been completed prior to attending this course, as the revision section is limited to a refresher on basic shiphandling techniques. Such a shiphandling course should cover: effects of deadweight, draught, trim, speed and under-keel clearance on turning circles and stopping distances; effects of wind and current on ship handling; application of rate of turn (ROT) techniques; manoeuvring in shallow waters, including under-keel clearance caused by squat, rolling and pitching; interaction between ships and between own ship and nearby banks (bank effect); berthing and unberthing under various wind, tide and sea-current conditions with and without tugs; ship and tug interaction, various types of tugs; use of propulsion and manoeuvring systems; and where possible, use of tunnel and azimuth thrusters.

A suitable course format is currently available as Offshore Loading Phase 1 at some training establishments.

➤ Objective

The reasons for the majority of the incidents related to vessel handling operations can be traced to human error or lack of professional problem mitigation. The main objective of the courses is to achieve optimal understanding and skills by the individual Master and DPO in DP mode and DP manual mode as well as in traditional manual modes where appropriate, which will further optimise the safety of the tanker's manoeuvring and loading operations.

Vessel handling exercises should be carried out on simulators. Approaches to the offshore terminal should be carried out primarily by using DP systems, but a manual mode approach should be included for comparison. Simulations should also include reconstruction of known DP incidents involving offtake tankers. The complexity and value of these exercises will be enhanced by appropriate previous experience of the person in charge of the simulator.

➤ Course content

The following sections outline a typical training course content designed to provide the competence required to achieve a satisfactory understanding and skill.

a) Ship handling Refresher section:

- Repetition of rate of turn (ROT) techniques and other theoretical items from basic Ship handling course noted in Purpose (above).
- Practical exercise on simulator to confirm adequate understanding of MCRM principles and practices
- Further practical exercises on simulator if the instructor considers it necessary, based on responses from above two assessments

b) Offshore Loading specific section:

- Gain knowledge of requirements and guidelines that apply to offtake tanker DPOs. Achieve increased skills in operating the DP system and the manual manoeuvring of vessels under normal and severe/marginal environmental conditions, with systems intact and with system errors, such as loss of position reference systems, thruster failure and sensor failures, etc.
- Gain a good understanding of the DP system's possibilities and limitations.
- Gain good understanding of field operator's offshore loading manuals for various fields.
- Gain good understanding of the correct use of position reference systems for DP.

c) General section:

- Review and updates in latest industry best practice (new legislation, new recommendations/guidance, new systems, new fields and terminal types).
- Revision of DP Systems and Operations (to include Tandem FPSO (Active and Passive); STL; OLS; and taut hawser options).
 - i. Interpret vessel specifications, field specifications and other data relevant to planning approach and offloading operations.
 - ii. Using capability plots and environmental data to assess the capability of the vessel to complete the planned operation safely.
 - iii. Ensure correct level of redundancy is available and that risks are assessed adequately.
 - iv. Develop contingency plans and 'escape' criteria/routes.
 - v. Demonstrate compliance with appropriate procedures for different stages of the operation.
 - vi. Demonstrate use of the Approach Mode, controlling the vessel speed and movement.
- Relative and Absolute Position reference systems such as DARPS, Artemis, Radius, Radascan, Fanbeam, and HiPap
 - i. Demonstrate correct set-up and use of such systems.
 - ii. Demonstrate awareness of errors and failures – how they occur, develop and need to be handled.
- Discuss and learn from recent and important past incidents from industry sources.

Simulator exercises in support of sections 2, 3 and 4, should include appropriate Failure Modes selected from the NI checklist, and:

- i. Manoeuvring according to field procedures and DP best practice.
- ii. Approach and departure with and without tanker assist vessels.
- iii. Ship handling in changing wind speed and direction
- iv. Ship handling in changing current speed and direction
- v. Ship handling with variable wind and current

- vi. Tandem positioning – free weathervane; operator selected heading; spread moored operation and taut hawser operations
- vii. Escape manoeuvring
- viii. Engine, propeller and rudder errors/failure
- ix. Thruster errors/failure
- x. DP errors
- xi. PRS errors
- xii. ESD 1 and 2 processes

➤ **Assessment:**

A theoretical and practical test should be held at the end of each course and an assessment report should be handed to the participant and a copy sent to the employer.

6c(iii) COURSE C:

Further DP Operations simulator course covering all aspects of DP experience and scenarios (not shuttle tanker) to ensure a wide range of generic DP understanding (content similar to many current sea time remission courses - but no such remission given).

- Capacity: 3 students maximum
- Duration: 37.5 hours
- Simulator: This course is done in a simulator Class A and is similar to the Sea Time Reduction course. For this course, shuttle tanker operations cannot be used for training.

This course will not reduce sea time or the offshore loading operations.

➤ **Course structure:**

The training will be predominantly practical/operational in nature.

Exercise scenarios/case studies will be carried out on a facility that effectively replicates the working environment the trainee will meet onboard. Failure mode checklist should be applied during the exercises.

Provision will be made for classroom tuition to facilitate student feedback of training needs in addition to exercise briefing/debriefing.

➤ **Course content:**

The focus of the exercises should be on DP station keeping and should address familiarity with the DP system and additional equipment and instruments, situational awareness, communications, emergency preparedness and response.

The range of exercises developed should be appropriate to the intended target group. Practical exercises shall not to be done on shuttle tanker operations.

In 2.2 below, one exercise should be in the form of a tabletop analysis. A FMEA should be used along with other appropriate documentation to evaluate a vessel's capability to carry out a given operation.

CORE COMPETENCIES TO BE DEMONSTRATED DURING THE EXERCISES BY THE TRAINEE DPO:

1. OPERATION OF A DP SYSTEM

1.1 Demonstrate the ability to set up and operate the DP system under the various control modes, and to carry out manual, mixed manual and automatic and fully automatic manoeuvres.

1.2 Demonstrate within the DP simulator the operation of position reference systems, sensors and peripheral equipment associated with the DP system.

2. DP OPERATION

2.1 Interpret vessel plans and specifications, capability diagrams and other data relevant to the planning and conduct of DP operations.

2.2 Using vessel and other data, assess the capability of the vessel to complete successfully any proposed operation.

2.3 Carry out risk assessment exercise on proposed operations and determine the level of redundancy appropriate.

2.4 Make appropriate contingency plans to cover any foreseeable system failure or operational requirement. Contingency planning to include appropriate 'escape routes' for the vessel.

2.5 Demonstrate compliance with appropriate procedures to be followed when approaching any work site and transferring from conventional vessel control to DP control.

2.6 Demonstrate effective completion of pre-DP and other checklists.

2.7 Demonstrate effective communications necessary during DP operations and the testing procedures.

2.8 Conduct vessel positioning manoeuvres and station keeping functions following operational plan and procedures.

2.9 Organise DP watchkeeping procedures observing recognised safe working practices.

2.10 Conduct appropriate watch handover procedures, completing appropriate checklists.

2.11 Maintain the appropriate logbooks and records pertaining to DP operations.

2.12 Evaluate the various information, warning and alarm messages communicated to the operator.

2.13 Relate the content of the messages in 2.12 above to the actions necessary in relation to the DP operation

3. EMERGENCY PROCEDURES

3.1 Recognise the conditions that will cause degraded operational status or emergency status

3.2 Recognise the warnings and alarms associated with catastrophic failure

3.3 Evaluate the various factors to be taken into account subsequent to any system failure and determine appropriate actions

3.4 Carry out procedures to stabilise the vessel position and heading subsequent to a variety of system failures and take appropriate decisions and actions relating to the continuance or abandonment of the operation.

This to include the following

a) Thruster fail to max pitch.

b) Setpoint/feedback offset.

c) Loss of all position reference system, entering move into DP system when in DR mode.

d) Worst case failure and action to be taken.

e) Movement of position reference systems.

However, there may be occasions in exceptional circumstances whereby there is no reasonably accessible training establishment available, even with reasonable forward planning by the vessel operator. In such circumstances a course (A, B, or C) may be completed in the same 'off vessel' period as another course, but such circumstances will have to be documented and forwarded to The Nautical Institute as an exception request with the certificate application. The trainee will remain obligated to complete the full sea service

expectation either as two consecutive minimum 24 day/two loading operations periods or combined into a single minimum 48 days sea service with minimum four loading operations so that the scheme rota remains on track.

APPENDIX A - STCW PART B¹ Guidance on the training and experience for personnel operating dynamic positioning systems

Section B-V/f*

1 Dynamic positioning is defined as the system whereby a self-propelled vessel's position and heading is automatically controlled by using its own propulsion units.

2 Personnel engaged in operating a Dynamic Positioning (DP) system should receive relevant training and practical experience. Theoretical elements of this training should enable Dynamic Positioning Operators (DPOs) to understand the operation of the DP system and its components. Knowledge, understanding and experience gained should enable personnel to operate vessels safely in DP, with due regard for safety of life at sea and protection of the marine environment.

3 The content of training and experience should include coverage of the following components of a DP system:

- .1 DP control station;
- .2 power generation and management;
- .3 propulsion units;
- .4 position reference systems;
- .5 heading reference systems;
- .6 environmental reference systems; and
- .7 external force reference systems, such as hawser tension gauges.

4 Training and experience should cover the range of routine DP operations, as well as the handling of DP faults, failures, incidents and emergencies, to ensure that operations are continued or terminated safely. Training should not be limited to DPOs and DP masters only; other personnel on board, such as electro-technical and engineer officers, may require additional training and experience to ensure that they are able to carry out their duties on a DP vessel. Consideration should be given to conducting appropriate DP drills as a part of onboard training and experience. DPOs should be knowledgeable of the type and purpose of documentation associated with DP operations, such as operational manuals, Failure Modes and Effects Analysis (FMEAs) and capability plots.

5 All training should be given by properly qualified and suitably experienced personnel.

6 Upon appointment to a vessel operating in DP mode, the Master, DPOs and other DP-trained personnel should be familiarised with the specific equipment fitted on and the characteristics of the vessel. Particular consideration should be given to the nature of the work of the vessel and the importance of the DP system to this work.

*Note there are no corresponding regulations in the Convention or sections in part A of the Code for sections B-V/a, B-V/b, B-V/c, B-V/d, B-V/e, B-V/f and B-V/g

¹ STCW Including 2010 Manila Amendments: STCW Convention and STCW Code. International Convention on Standards of Training, Certification and Watchkeeping for Seafarers. IMO International Maritime Organization, 2011, p 341

APPENDIX B – TRAINING METHODOLOGY

In preparing this guidance for NI accredited DP training centres The Nautical Institute intends to promote a consistently high and verifiable standard of delivery across all centres and courses.

DP training is a complex undertaking. A student must not only acquire a great deal of knowledge but then translate that knowledge into physical responses in sometimes very stressful conditions. In other words, a DPO must develop an attitude based on his knowledge that allows him to act appropriately in a given situation.

APPENDIX B/1 – PREPARING YOUR TRAINING METHODOLOGY STATEMENT

To enhance the likelihood of success in such a complex undertaking, the NI requires that training centres provide a written statement of the centre's training methodology. In other words, the NI requires the centre to develop a written statement explaining the system of methods and principles that they intend to follow as they plan, design, assess and evaluate the effectiveness of the training/learning that takes place at their centre.

As with any model course published by IMO, this accreditation standard has provided certain non-negotiables: the amount of teaching time required for each course, student/instructor/equipment ratios, the learning objectives for each course, and standardised assessments. However, your choice of training method/s depends on what fits your centre — based on your centre's educational philosophy, classroom demographic and mission statement as well as the teaching skills of your instructors.

This will possibly require some research and thought on the part of your centre. By the nature of simulator based training with adults there are certain choices that have more or less been made for your centre. The training you provide will most likely be *student-centred*¹, using *inquiry-based*² and *co-operative*³ learning to varying degrees. However, the framework in which these activities are carried out is still open to you. Your centre may choose to base your training⁴ on the universally known *Bloom's Taxonomy*⁴. Or you might decide that the *SOLO*⁵ or *Fink's*⁶ taxonomies suit your particular centre better. The nature of simulator training lends itself to *formative assessment*⁷, as the instructor must continually gauge student reaction to the exercises he has prepared in order to continuously adapt them to the performance levels of the students. If your centre uses formative assessment, how does the centre document this and ensure objectivity across all the instructors? As all DP students are adults, what strategies does the centre employ to address the specific needs of adult learners? In addressing this question your instructors should become familiar with the term *andragogy*⁸.

Below you will find brief descriptions of the terms in italics above with links to references where appropriate. You will also find a list of recommended readings and references.

The information provided in the above paragraphs is not exhaustive; if there are learning taxonomies, training methods etc that your centre wishes to use that are not mentioned here, that is perfectly fine. That is why we ask that you make a written statement of what they are. This serves not only to inform the NI auditors who visit the centre but is valuable for the instructors who work at the centre.

IMPORTANT TERMS

1 *Student-centred learning*

While teachers are an authority figure in this model, teachers and students play an equally active role in the learning process. The teacher's primary role is to coach and facilitate student learning and overall comprehension of material. Student learning is measured through both formal and informal forms of assessment, including group projects, student portfolios, and class participation. Teaching and assessment are connected; student learning is continuously measured during teacher instruction.

2 *Inquiry-based learning*

Inquiry-based learning is a teaching method that focuses on student investigation and hands-on learning. In this method, the teacher's primary role is that of a facilitator, providing guidance and support for students through the learning process. *Inquiry-based learning* falls under the *student-centred* approach, in that students play an active and participatory role in their own learning process.

3 *Co-operative learning*

Co-operative Learning refers to a method of teaching and classroom management that emphasizes group work and a strong sense of community. This model fosters students' academic and social growth and includes teaching techniques such as reciprocal teaching. *Cooperative learning* falls under the *student-centred approach* because learners are placed in responsibility of their learning and development. This method focuses on the belief that students learn best when working with and learning from their peers.

4 *Bloom's Taxonomy*

<http://www.nwlink.com/~donclark/hrd/bloom.html>

explanation of Bloom's Taxonomy (also mentions SOLO Taxonomy) and provides links to reference materials
http://classic.icc.edu/innovation/PDFS/assessmentEvaluation/RevisedBloomsChart_bloomsverbsmatrix.pdf

Cognitive domain - Verbs, Materials/situations that require this level of thinking, potential activities and products

Bloom's Taxonomy underpins the classical 'knowledge, attitude, skills' structure of learning method and evaluation and is one of the most widely used systems of its kind in education. It is a simple, clear and effective model, both for explanation and application of learning objectives, teaching and training methods, and measurement of learning outcomes.

Bloom's Taxonomy model is in three parts, or overlapping domains:

1. Cognitive domain (intellectual capability, i.e. knowledge, or 'think')
2. Affective domain (feelings, emotions and behaviour, i.e. attitude, or 'feel')
3. Psychomotor domain (manual and physical skills, i.e. skills, or 'do')

In each of the three domains *Bloom's Taxonomy* is based on the premise that the categories are ordered in degree of difficulty. An important premise of *Bloom's Taxonomy* is that each category (or level) must be mastered before progressing to the next. As such the categories within each domain are levels of learning development, and these levels increase in difficulty. This dovetails well with the structure of the NI DP Scheme. The Induction course must be passed initially and the task sections completed successfully before undertaking the Simulator course. This then must be successfully completed before beginning ship-specific training and practice.

The simple matrix structure enables a checklist or template to be constructed for the design of learning programmes, training courses, lesson plans, etc. Effective learning should arguably cover all the levels of each of the domains, where relevant to the situation and the learner. The learner should benefit from development of knowledge and intellect (cognitive domain); attitude and beliefs (affective domain); and the ability to put physical and bodily skills into effect – to act (psychomotor domain).

5 SOLO Taxonomy

<http://www.johnbiggs.com.au/academic/solo-taxonomy/>

SOLO, which stands for the Structure of the Observed Learning Outcome, is a means of classifying learning outcomes in terms of their complexity; as learning progresses it becomes more complex. This view enables the assessment of students' work in terms of its quality rather than according to how many bits of this and of that they got right. At first only one or few aspects of the task (unistructural) are focused upon, then several aspects but they are unrelated (multistructural), then we learn how to integrate them into a whole (relational), and finally, we are able to generalise that whole to as yet untaught applications (extended abstract). There is a diagram at the associated link to help illustrate the concept.

SOLO can be used not only in assessment, but in designing the curriculum in terms of the learning outcomes intended, which is helpful in implementing constructive alignment. In constructive alignment, we start with the outcomes we intend students to learn, and align teaching and assessment to those outcomes. The outcome statements contain a learning activity, a verb, that students need to perform to best achieve the outcome, such as “*apply* expectancy-value theory of motivation”, or “*explain* the concept of ... “. That verb says what the relevant learning activities are that the students need to undertake in order to attain the intended learning outcome. Learning is constructed by what activities the students carry out; learning is about what they do, not about what we teachers do. Likewise, assessment is about how well they achieve the intended outcomes, not about how well they report back to us what we have told them. The *SOLO Taxonomy* helps to map levels of understanding that can be built into the intended learning outcomes and to create the assessment criteria or rubrics. Constructive alignment can be used for individual courses, for degree programmes, and at the institutional level, for aligning all teaching to graduate attributes.

6 Fink's Taxonomy

http://www.wcu.edu/WebFiles/PDFs/facultycenter_SignificantLearning.pdf

This is an article by L. Dee Fink, the creator of the taxonomy

<http://www.psychologicalscience.org/index.php/publications/observer/2011/september-11/using-finks-taxonomy-in-course-design.html>

This is an article in which a professor explains how she used the taxonomy to create the course she teaches

Fink encourages instructors to create learning goals based on his taxonomy of significant learning rather than relying on a content-driven method of course design. Fink's approach switches the emphasis away from content toward the goals and skills the instructor wants his or her students to retain after the course is completed.

7 Formative Assessment

Formative assessment is a range of formal and informal assessment procedures employed by teachers during the learning process in order to modify teaching and learning activities to improve student attainment. It typically involves qualitative feedback (rather than scores), for both student and teacher, that focuses on the details of content and performance.

8 Andragogy

Andragogy is the term that refers to the methods or techniques used to teach adults.

<http://www.instructionaldesign.org/theories/andragogy.html>

A one page summary of *Andragogy*

http://www.assetproject.info/learner_methodologies/before/characteristics.htm

a list of the characteristics of adult learners

http://www.assetproject.info/learner_methodologies/during/strategies.htm

same website but this page provides teaching strategies that work with adult learners

APPENDIX B/2 – READINGS

Since simulator training plays such an integral part in the NI DP Training Scheme, it is imperative that this training is as well planned and relevant as possible. Therefore, the NI recommends the following:

- A Simulation Instructor’s Handbook: The Learning Game by Jillian Carson-Jackson Med MNI AFRIN, published by The Nautical Institute. This is a small, 68 page volume that is packed with useful information.
- Model Course 6.10 Train The Simulator Trainer and Assessor 2012 Edition, published by the IMO. This is a 142 page document that discusses technical aspects of teaching using simulators in the MET environment.
- *Bridge Resource Management, Simulation and Experiential Learning “A Loaded Gun”* by Captain George Sandberg USMS FNI, Director of Nautical Science Simulation, US Merchant Marine Academy, Kings Point, New York. This document is copyrighted and for illustration only. Though it discusses BRM courses the principles are directly relevant to any type of simulator training.
The principles of using simulators to teach Bridge Resource Management are examined in the context of the experiential learning process. A direct link is established between components of well designed Bridge Resource Management courses and the components of the experiential learning cycle. The advantages of using simulation as the primary teaching tool in meeting the objectives of these courses by creating situations where the students learn from direct experience are discussed. It is noted that there is a misconception that experiential learning is free choice or learning by chance that focuses solely on the student and the role of the instructor is minimised or totally eliminated. The danger of teaching bad practice, unacceptable risk taking, developing overconfidence, destroying confidence and creation of “mis-educative experiences” are explained. The importance of the instructor in preventing undesired teaching results is discussed.

This article is available at:

<http://www.nialexisplatform.org/accreditation/dynamic-positioning/training-centres-area/>

APPENDIX B/3 – EXAMPLE DOCUMENTS FROM TRAINING CENTRES

EXAMPLE A – MODEL FOR DESIGNING AND DELIVERING DP SIMULATOR TRAINING EXERCISES DEVELOPED BY ONE DP TRAINING CENTRE

Set up of a training scenario using a simulator

- Scenario objectives
- Required knowledge and skills level (pre-requisites)
- Start information (environmental, traffic factors, etc)
- Training material necessary (paper charts etc)
- Briefing consisting of 2 parts:
 - o Scenario objectives (SMART)²
 - o Feedback criteria (how do we measure the participant obtained the correct level)
- Theoretical explanation (clearing up questions, reminders)
- Definition of the starting conditions (course, heading, speed, engines running etc)
- Definition of roles and responsibilities in the bridge team
- Task preparation
- Actual run; all events must be connected to a scenario objective (all other are just diverting attention from the real goals of the course)
- Debriefing part; consisting of 2 parts
 - o Feedback participant and/or peers on performance
 - o Feedback of instructor, focusing on the scenario objectives, hand in hand with the competence checklist.

² *Specific – Measurable – Assignable – Realistic – Time-related*

EXAMPLE B – LESSON PLAN

DSV AIR DIVE GENERAL OBJECTIVES

Perform drift and alert light and e-stop test. DP practice covering safe operation, communication and reporting during manoeuvring and static DP, operations to support diving, procedures inside and outside the 500m zone and bringing the vessel to the platform for dive operations. Create alert agreement

EXERCISE ENVIRONMENT

Area	South China Sea Gulf of Thailand Open Sea - Early morning to daylight, reduced visibility by rain				
Wind	4 to 6 knots/NE-SW	Current	1.5'/E-ESE	Waves	1.2-1.8m E/ + Swell SE - (see detailed weather forecast)
Own vessel	DSVDP2				
Targets	Platforms, wellheads and pipelines				
Worksite	DPCS oilfield				

DESCRIPTION

All students will control a model vessel, performing diving operations on DP in DP2 compliant mode as per the alert agreement. They shall carry on the bridge watchkeeping following all the procedures for a safe operation and following the alert agreement once they are in position.

INSTRUCTOR'S GUIDELINES

Issue each student with the Diving Exercise work book (consisting of exercise instructions, field drawing, charts, pilot and tide NP books, safe zone location, pre-DP checklist and DP setup settings and drift test recording form). Instructor to run through operation scenario and allocate vessel and job task to students (instructor would have loaded required vessel prior to starting the class; it will be outside the 500m when it starts). Instructor to run through safety plan, pre-DP checklist (drift test instructions are on the form) and communications protocol as contained in the student's Course manual and the safety procedures to do the operation. The instructor assists with any questions. The students then start the exercise by moving into position and carrying out exercise as per the instructions. Time allocated is approx 180 minutes, after which the instructor carries out questions and answer session (time allocated approx 15 minutes), instructor asks students to rotate DPO position to the next student. He/she moves the vessel to the next leg of the operation and repeats the procedure then advises the instructor. The exercise will require the full use of the communications (phone/VHF) and the alert lights and possibly the e-stops. Instructor to hold open discussion with students as a debrief during which time the instructor will raise observations he may have noted during the exercises with the recorded data. Evaluation forms to be completed for each student.

EVALUATION

Instructors shall fill in the evaluation report for each console (vessel)

Method of instruction	Students on their own, instructor in simulator control room on the phone for all calls and to send equipment faults and environment changes to the consoles and record key points for the exercise.
Resources to be used:	DP NMS 6000 software and hardware -DP1 and DP2 set up and chart screen
Total time spent:	3 1/2 hours for two students
Student reference:	Course material handouts, FMEA, charts 3963 and 66, NP 203 and 30, UTM subsea and worksite diagrams and the Nav chart screen data loaded.

EXAMPLE C: RECORDING STUDENT PERFORMANCE

Summary of Simulation		
Team 1	Team 2	Team 3
Team Members	Team Members	Team Members
Wind:	Wind:	Wind:
Current:	Current:	Current:
Final Approach Heading:	Final Approach Heading:	Final Approach Heading:
500 M Checklist Completed:	500 M Checklist Completed:	500 M Checklist Completed:
Dive Checklist Complete:	Dive Checklist Complete:	Dive Checklist Complete:
Communications Check Completed:	Communications Check Completed:	Communications Check Completed:
DP Events Induced by Instructor	DP Events Induced by Instructor	DP Events Induced by Instructor

EXAMPLE D – RECORDING STUDENT PERFORMANCE

DP advanced Competence checklist		Participant name:		
		Date:		
NI competence		Tax code	Checked	Comment:
1. OPERATION OF A DP SYSTEM				
1.1	Demonstrate an ability to set up and operate the DP system under the various control modes, and to carry out manual, mixed manual / automatic and automatic manoeuvres	A		
1.2	Demonstrate the operation of position reference systems, sensors and peripheral equipment associated with the DP system	A		
2. DP OPERATION				
2.1	Interpret vessel plans and specifications, capability diagrams and other data relevant to the planning and conduct of DP operations	A		
2.2	Using vessel and other data, assess the capability of the vessel to complete successfully any proposed operation	A		
2.3	Carry out risk assessment exercise on proposed operations and determine the level of redundancy appropriate	A		
2.4	Make appropriate contingency plans to cover any foreseeable system failure or operational requirement. Contingency planning to include appropriate "escape routes" for the vessel.	A		
2.5	Demonstrate compliance with appropriate procedures to be followed when approaching any work site and transferring from conventional vessel control to DP control	A		
2.6	Demonstrate effective completion of Pre DP and other checklists	A		
2.7	Demonstrate effective communication needed during DP operations and the testing procedures	A		
2.8	Conduct vessel positioning manoeuvres and station keeping functions following operational plan and procedures	A		
2.9	Organise DP watch keeping procedures observing recognised safe working practices	I		
2.10	Conduct appropriate watch handover procedures, completing appropriate checklists	A		
2.11	Maintain the appropriate logbooks and records pertaining to DP operations	A		
2.12	Evaluate the various information, warning and alarm messages communicated to the operator	I		
2.13	Relate the content of the messages in 2.12 above to the actions necessary in relation to the DP operation	I		
3. EMERGENCY PROCEDURES				
3.1	Recognise the conditions that will cause degraded operational status or emergency status	K		
3.2	Recognise the warnings and alarms associated with catastrophic failure	K		
3.3	Evaluate the various factors to be taken into account subsequent to any system failure and determine appropriate actions	I		
3.4	Carry out procedures to stabilise the vessel position and heading subsequent to a variety of system failures and take appropriate decisions and actions relating to the continuance or abandonment of the operation	A		

Levels of Cognition
Level 1: Knowledge (K) to remember or to reproduce on basis of appropriate, previously learned information.
Level 2: Understanding (U) To give meaning to new situations and or new material by recollection and using necessary present information. To give evidence of insight in certain activities.
Level 3: Application (A) To use previously acquired information in new and concrete situations to solve problems that have single or best answers.
Level 4: Integration (I) To separate information into their component parts, to examine such information to develop divergent conclusions by identifying motives or causes, making inferences, and or finding evidence to support generalizations. To creatively apply prior knowledge and skills to produce a new or original whole. To judge the value of material based on personal values or opinions, resulting in an end product, with a given purpose, without real right or wrong answers.

Instructor name:
Date:
Sign:

APPENDIX C – DP INSTRUCTOR REQUIREMENTS

- 1) **DP INSTRUCTOR CERTIFICATE:** A NI DP certificate is required to become a DP instructor.
- 2) **MINIMUM EXPERIENCE:** DP instructors must have a minimum of 1 year experience onboard a DP vessel as a certified DPO before becoming a DP instructor.
- 3) All instructors must hold a **teaching certificate**; the teaching certificate or qualification does not need to be the one that takes from one to two years to be completed. Rather, there are several courses in the market that deliver teaching courses within a few weeks. These courses shall focus on teaching methodology and assessment.
 - 3.1) The **train the trainer of IMO 6.09** and **IMO 6.10** can be accepted by The Nautical Institute as a teaching certificate.
- 4) All instructors must undertake a **training programme** and **pass the assessment made by the training centre**, following the table of competences to become a DP instructor. Training programme and table of competences are described further in this document.
- 5) The centres are allowed to have **instructors on a rotation or on-call basis**. However, all of them will have to present their teaching certificate and training programme and be approved by The Nautical Institute.
 - 5.1) Centres which have instructors on a rotation or on-call basis, must have a full-time DP teaching team leader (or supervisor), who will be responsible for updating and reviewing the material annually.
 - 5.2) The DP teaching team leader or supervisor must be full-time³ at the centre (or group in case of satellite centres) and also be responsible for all other instructors and their continuing training development.
 - 5.3) Meetings should be held and documented twice a year with all the instructors to review the course performance, align instructors with course content and update them as to new standards and industry requirements. The minutes of such meetings will be required as evidence during the NI audits.
- 6) Training centres are allowed to use instructors from another institution; however the instructors must meet the requirements based on the items 1, 2, 3 and 4 above.
- 7) All training centres must develop and put in place a proper annual appraisal (annual performance assessment) for instructors, which shall be recorded in writing.
 - 7.1) The annual appraisal of all DP instructors must be done not only by the feedback form from students, but also by the teaching team leader. This appraisal should consist of watching the instructor during the lectures, noting instructor attendance at conferences or seminars, courses and training, competences or any other feature that shows continuous professional development. Appraisal can be done by third parties external to the centre who are able to assess the teaching methodology and instructor's skill.

³ Full-time is a person who is employed by the training centre and is responsible for the daily management of the DP training course and delivering or supervising the delivery of DP training at the facility.

- 8) **Grandfather clause for instructors:** Training centres that have had their DP instructors approved before 2008 under the grandfather clause will have their instructor's approval reviewed on a case by case basis. The reason for this review is to identify the people who have been grandfathered in the past. The NI may keep those who have been identified and grandfathered due to their employment implications. However, the grandfather clause is removed from the scheme.
- 9) **Time for Instructor Training:** DP instructor training must be completed within 4 years of the training commencement.
- 10) **Informing the Institute of Training Commencement:** It is not mandatory to inform the NI once a Training Centre commences training a new instructor. The NI is to be informed once the training programme is completed and an approval letter is to be requested. The onus of the application would rest on the Training Centre to ensure they train a person who also complies with the other requirements to be an instructor as laid down in the Standards (Holder of valid DP Certificate, completion of one year DP sea time after obtaining the DP Certificate, Completion of Train the Trainers Programme, training on equipment specific to and in use at the centre etc). Should all requirements not be complied with, The Institute may reject the formal application for approval if the person does not fulfil all the requirements. For this reason, the Institute recommends that training centres to send the initial documentation about the new trainee instructor once he/she commences the training for initial document verification. So the centre reduces the risk of having any further rejection.

Note: Only Training instructor is authorised to sign the DP logbooks and certificates during the training programme.

- 11) **New instructors or change of DP instructors:** Training centres that do not report a change of instructor to the NI or use an instructor that has not been approved by NI will have their accreditation cancelled, pending full audit. If a centre does not meet all the requirements for instructors, it may also have their accreditation cancelled, pending full audit.

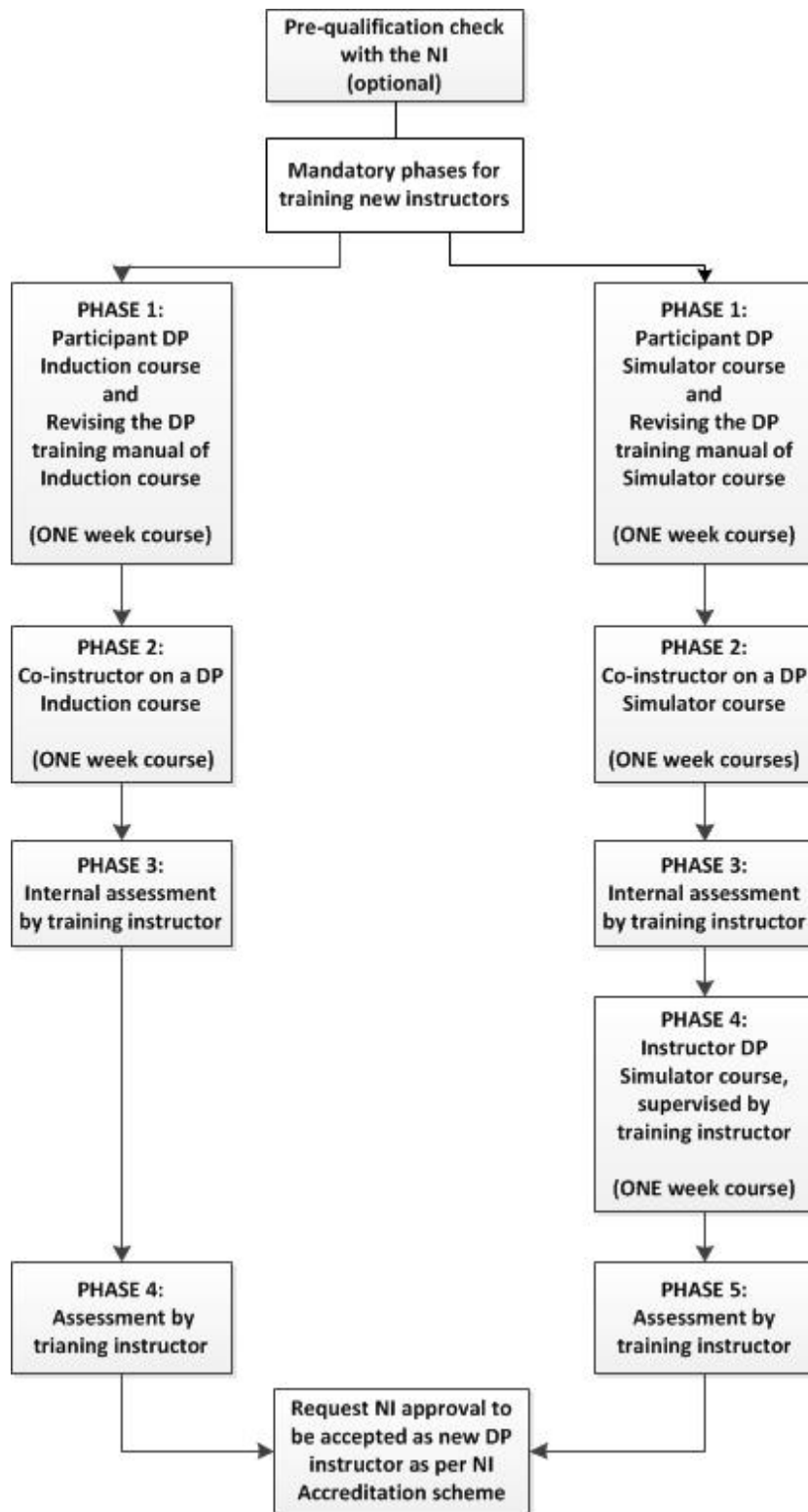
APPENDIX C/1 - TRAINING PROGRAMME FOR NEW INSTRUCTORS

1. The new trainee instructor must be a participant in the Induction and Simulator courses for a period of one week each. These are attendance and revision courses. It is expected that they will study and revise (if necessary) the DP training manual before delivering any of the courses.
2. The new trainee instructor will thereafter participate in the delivery of an Induction Course as a co-instructor (under the supervision of an experienced *training instructor*) and a Simulator course, (under the supervision of an experienced *training instructor*). Each course will be of one week's duration.
3. The new trainee instructor must then be internally assessed by the *training instructor* for the four courses (two attendance courses and the two delivered as co-instructors), based on the table of competences and methodologies for those courses.
4. After the above assessment, the new trainee instructor shall deliver one Simulator Course independently, under the observation of the *training instructor*. This will be for one week and shall also be assessed by the *training instructor*.
5. The *training instructor* is considered a person who has been previously approved by the Nautical Institute and has taught a minimum of 4 Inductions courses and 4 Simulator courses within one year before being able to undertake the training of a new trainee instructor.
6. The training of the new trainee instructor shall be undertaken in the same simulator equipment installed at the training centre where the trainee instructor will eventually conduct courses.
7. The new trainee instructor shall be re-assessed by the *training instructor* and if approved, then the training centre must send the new trainee instructor's documents to The Nautical Institute for approval. The documents are:
 - a. Copy of NI DP certificate
 - b. Copy of instructor's CV
 - c. Copy of teaching certificate
 - d. Copy of DP logbook with at least one year DP sea time from the date of NI DP certificate issuance
 - e. Copy of each instructor's training programme properly dated and signed off by training centre/training DP instructor.
8. A written record of all the above training with dates that each phase is completed and signatures of *training instructors* who oversee the trainee instructor should be kept for each instructor. The records shall be sent to the NI for approval. Please see an example template in Appendix C/4

In the case of a **new training centre**, which does not have a *training instructor* in place to deliver the training programme, two means of training new DP instructors are possible: the new trainee instructor may be sent to another NI accredited training centre to complete the training and to be assessed, following all the conditions/items above, or a new centre may hire an already NI approved DP instructor to come to the new centre and carry out the training programme above.

If the new trainee instructor has been already trained by another training centre, the new instructor will be required to provide evidence of the training programme taken in the previous centre. This shall be sent to the NI as evidence and for final approval. If the new trainee instructor cannot show evidence of being previously trained by another training centre, he/she will be required to undertake the training programme in the new centre.

APPENDIX C/2 - TRAINING PROGRAMME PHASES



APPENDIX C/3 - COMPETENCY FRAMEWORK

No instructor should teach a DP course accredited by The Nautical Institute until they have completed that course as a student. A new instructor should complete a particular DP course at least once in order to become familiar with the course content and the equipment used.

Subsequently, new instructors will deliver all elements of the shore-based courses under supervision. They should teach any element at least once under supervision. The rate at which new material is covered should be based on the instructor's competence, agreed with the supervising instructor/instructors.

Specification of minimum standard of competence for DP instructors

Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
General			
Nautical Institute Training Scheme	<ol style="list-style-type: none"> 1. Knowledge of NI DP training scheme. 2. Structure of scheme. 3. Knowledge of requirements and guidelines. 4. Knowledge of certification requirements 	Examination and assessment of evidence from approved training programme	General understanding of NI training scheme
Training centre procedures/quality management	Knowledge and understanding of individual training centres procedures and quality management systems		Follows procedures and demonstrates general understanding of quality management procedures
Training centre training materials/documentation	<ol style="list-style-type: none"> 1. Knowledge of centre training materials and documentation 2. Ability to use training materials 		Competent delivery of training materials
Training centre equipment	Ability to set up and operate centre equipment		Sets up DP equipment Operates and demonstrates use of equipment

Induction course			
DP principles	Ability to effectively communicate relevant course aims and objectives	Observation of competent delivery	Competent delivery of subject matter and training materials
Elements of DP system	Ability to effectively communicate relevant course aims and objectives		

Practical operation of DP system	Ability to effectively communicate relevant course aims and objectives		
Position reference/monitoring systems	Ability to effectively communicate relevant course aims and objectives		
Environmental sensors	Ability to effectively communicate relevant course aims and objectives		
Power generation and supply	Ability to effectively communicate relevant course aims and objectives		
DP operations	Ability to effectively communicate relevant course aims and objectives		

Simulator course			
Delivery of additional theory and review materials	Ability to effectively communicate relevant course aims and objectives	Observation of competent delivery	Competent delivery of subject matter and training materials
Equipment/simulator set up	Ability to set up and operate effectively centre equipment		Sets up simulation scenarios
Exercise set up/briefing	Transmits relevant information to students		Communication is clear concise and acknowledged
Delivery of exercise outcomes	<ol style="list-style-type: none"> 1. Knowledge of planning, conduct and execution of DP operations 2. Knowledge of common DP operational faults 3. Knowledge of DP procedures 4. Knowledge of various types of DP emergency 		Competent delivery/facilitation of scenario exercises
Debrief exercises	Transmits relevant information to students		<ol style="list-style-type: none"> 1. Identifies that exercise conforms with accepted procedures 2. Effectively debriefs exercise

**APPENDIX C/4 TRAINING PROGRAMME AND ASSESSMENT TABLE FOR NEW INSTRUCTORS
(To be recorded and sent to the Nautical Institute)**

INDUCTION COURSE
TRAINING PROGRAMME TABLE FOR NEW INSTRUCTORS

Name of Trainee Instructor:

Name of Training Instructor:
(as per definition on appendix C/1)

Name of Training Centre:

PHASE 1	TRAINEE INSTRUCTOR AS PARTICIPANT IN INDUCTION COURSE	dd/mm/yy	Instructors Signature	Remarks
PHASE 2	TRAINEE INSTRUCTOR AS CO-INSTRUCTOR ON A DP INDUCTION COURSE			
Competence	Knowledge, Understanding and Proficiency	dd/mm/yy	Signature	Remarks
GENERAL				
Nautical Institute Training Scheme	1. Knowledge of NI DP training scheme			
	2. Structure of scheme			
	3. Knowledge of requirements and guidelines			
	4. Knowledge of certification requirements			
Training centre procedures / quality management	Knowledge and understanding of individual training centres procedures and quality management system			
Training centre training materials / documentation	1. Knowledge of centre training materials and documentation			
	2. Ability to use training materials			
Training centre equipment	Ability to set up and operate centre equipment			
INDUCTION COURSE				
		dd/mm/yy	Signature	Remarks
DP Principals	Ability to effectively communicate relevant course aims and objectives			
Elements of DP system	Ability to effectively communicate relevant course aims and objectives			
Practical Operation of DP system	.Ability to effectively communicate relevant course aims and objectives			
Position reference / monitoring systems	.Ability to effectively communicate relevant course aims and objectives			
Environmental sensors	.Ability to effectively communicate relevant course aims and objectives			
Power generation and supply	Ability to effectively communicate relevant course aims and objectives			
DP Operations	Ability to effectively communicate relevant			

	course aims and objectives			
PHASE 3				
Internal Assessments and Comments of Phase 1 and 2 by Training Instructor				
Date:		Training Instructor's Signature:		

APPENDIX C/4 TRAINING PROGRAMME AND ASSESSMENT TABLE FOR NEW INSTRUCTORS
(To be recorded and sent to the Nautical Institute)

SIMULATOR COURSE

TRAINING PROGRAMME TABLE FOR NEW INSTRUCTORS

Name of Trainee Instructor:

Name of Training Instructor:
 (as per definition on appendix C/1)

Name of Training Centre:

PHASE 1	Date from (DD/MM/YY)	Date to (DD/MM/YY)	Training Instructor Signature
Trainee Instructor as participant in the Simulator Course			

Competence	Knowledge, Understanding and Proficiency	PHASE 2		PHASE 4	
		dd/mm/yy	Training Instructor signature	dd/mm/yy	Training Instructor signature
Delivery of additional theory and review materials	Ability to effectively communicate relevant course aims and objectives				
Equipment/Simulator Set-Up	Ability to set up and operate effectively centre equipment				
Exercise set up/ briefing	Transmits relevant information to students				
Delivery of exercises outcomes	1. Knowledge of planning , conduct and execution of DP Operations				
	2. Knowledge of common DP operational faults				
	3. Knowledge of DP procedures				
	Knowledge of various types of DP emergency				
Debrief Exercises	Transmits relevant information to students				

PHASE 3

Internal Assessment / Comments of Phase 1 and 2 by Training Instructor

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Date: Training Instructor Signature:

PHASE 5

Internal Assessment /Comments of Phase 4 by Training Instructor

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Date: Training Instructor Signature:

APPENDIX D – DP CLASSROOM REQUIREMENTS

FACILITIES

1. Accommodation and transport suitability

Some training centres provide accommodation/hotel and transport for students. Where it is applicable, the NI will require the centre to provide evidence of giving this information to students.

Some training centres include the hotel reservation and free transportation as part of the training package. This should be clearly stated in the company's agreement with students.

Where accommodation and transport are not part of the course package provided by the centre, no documentation related to it will be required. However, a clear booking system must be in place and be part of the administrative procedures.

2. Infrastructure

The training centre shall determine, provide and maintain the infrastructure needed to achieve conformity to the NI requirements. Infrastructure includes as applicable:

- a) buildings, workspace and associated utilities
- b) process equipment (both hardware and software)
- c) supporting services (such as transport, communication, health & safety)

Site plan

Documented site plans shall be in place and displayed in a common area, showing the facilities and rooms available as well as emergency exits.

2.1 Healthy & safety

2.1.1 Ventilation

Almost all DP equipment gives off heat, which can build up during the day and become quite oppressive for users, as well as detrimental to the equipment.

For this reason, the scheme requires that the temperature of the classrooms should be between 18 and 24 degrees Celsius, with humidity between 40% and 60%. An air conditioning unit or fan which is able to control temperature and humidity is required.

2.1.2 Lighting

- a) Lighting should be designed for the tasks that individuals are carrying out within that environment.
- b) Windows should be fitted with blinds to avoid glare for display screen users.

2.1.2.1 Emergency lighting

This is designated when the normal light fails and is set up for escape routes, effective evacuation of occupied buildings and to enable particular activities to continue. The emergency lights must be powered from a source independent of that supplying the normal lighting.

The emergency lighting must comply with local regulations and be tested and maintained periodically.

2.1.3 Noise

Poor acoustic conditions in the classroom increase the strain on instructors' voices as most of them find it difficult to cope with high noise levels. Furthermore, noise can disrupt the concentration and attention of students. As a result, the level of sound should be kept to a minimum and comply with local regulations.

Where sound is over 85 decibels, sound insulation, reverberation and indoor noise levels control will be required.

2.1.4 Electrical safety

- a) Sufficient electrical outlets should be available so that all equipment can be positioned and used safely.
- b) The location of electrical equipment depends on the length of cables and the availability of sockets for telephones, TV aerials and power. The location of the equipment must not increase the risk of danger to equipment or users. Regular visual checks of plugs, leads and other electrical equipment should be undertaken.
- c) Good desk design should incorporate cable management and may be modular to allow flexible arrangement. Cables must be kept tight and as hidden as possible.

2.1.5 Fire warning systems and exits

- a) A fire alarm is required for evacuation and emergency purposes. Students should be notified about possible tests and how and where to proceed in emergency situations before starting the classes.
- b) Gangways and emergency exits must be marked with proper signage and be kept clear/unobstructed at all times.
- c) Appropriate fire-fighting and first aid equipment should be close to hand and clearly signed.

2.2 Classroom

A suitable classroom is required with desks or tables and adjustable chairs.

- a) As a rule of thumb, each student should be allocated a minimum of 2 square metres.
- b) Every classroom should have a clock on the wall for exercises and exams.
- c) Every classroom should have a white board and/or flip chart

2.2.1 Visual aids

Charts with DP illustrations are required in the classroom and must be visible to students.

2.2.2 Technical equipment

- a) All DP centres should have the requisite equipment required in the document **NI DP simulator / equipment specification (Appendix E)** for the courses they deliver.
- b) Additional rooms may be used if the class is split into groups or for the Simulator course equipment.
- c) For the purpose of conducting the Simulator course, the instructor should be positioned in a separate room.
- d) The main teaching room should be provided with either a whiteboard or an alternative writing area, such as a flip chart or multimedia facilities.

2.2.3 Projection equipment

A maximum of 1500 ANSI lumens is generally considered adequate for projection equipment in most classroom environments, except in the most extreme ambient lighting conditions. In bright daylight it is advisable to use window blinds rather than increase the brightness of the projector.

2.3 Furniture

2.3.1 Chairs, desks

- a) The furniture in the classroom must be comfortably positioned with easy access to all equipment.
- b) A classroom is required to have chairs with adjustable seat heights and back positions in relation to the equipment. Students need to be able to sit at the recommended height with their eye level at the top of the

screen. To achieve the correct posture, the lower arms should be roughly horizontal when working, knees should fit comfortably under the desk with the thighs roughly horizontal, and the back should be kept straight.

c) Desks should have enough space around for paper, books and other materials, as well as space for more than one user at a time, and for the instructor to gain access.

d) Centres therefore need to make purchasing decisions based on a clear understanding of the teaching methods in use, how their students interact with their environment, and what the furniture is expected to do.

e) Desks and chairs shall be kept in good condition and have periodical maintenance with a proper record.

f) The centre should have a risk assessment of the facilities.

2.3.2 Computer and workstations

a) Monitors should tilt and swivel to suit the requirements of individual users.

b) The top of the screen should be roughly at eye level.

c) Screens should be positioned to reduce reflection and glare from lights and windows, using blinds where necessary, and should be adjustable for brightness and contrast as the lighting changes throughout the day.

d) They should also be cleaned regularly.

e) Users should have the option of using the keyboard flat or tilted.

2.3.2.1 Computers and workstations for online assessment system

The following is required:

- a) One computer/workstation per student (1:1 ratio)
- b) Workstations shall be separate for each student or have at least one 1 metre of distance between them
- c) Workstations and computers must follow the health and safety requirements stipulated above
- d) There must be internet connection for all computers

The Nautical Institute does not recommend using the same computers/workstations for the simulator and the assessment systems as this may affect the simulator system stability. Where centres prefer using the same computers for both training and assessment, the centre will be required to keep a regular schedule of maintenance to the DP system. Evidence of this maintenance might be required.

For the assessment system, the minimum IT system requirements are:

- Internet Explorer 7
- 233 MHz processor
- Windows XP Service Pack 2
- RAM: 64 MB for 32-bit Windows XP/Server 2003, 128 MB for 64-bit Windows XP/Server 2003.

2.4 Domestic

Training centres are required to provide domestic facilities to students, such as toilets, kitchen or refreshments.

2.4.1 Toilets

There should be separate toilets for each gender, properly signed and routinely cleaned/maintained. Cleaning/maintenance should be recorded.

2.4.2 Kitchen and refreshments

It is recommended that the centre provide a kitchen or refreshment facility to students. Where there is a lack of space to provide a kitchen or refreshment facilities for students, it is recommended that external agreements are made with local shops.

APPENDIX E – NI DP SIMULATOR/EQUIPMENT SPECIFICATIONS

After this specification comes into effect, any item that does not have the note “(Required by January 2020.)” will be required for all simulators.

After this specification comes into effect, any item that has the note “(Required by January 2020.)” will be recommended for all simulators. In January 2020, the recommended items will become mandatory for all simulators.

Centres that are due for accreditation before 2020 must have the new simulator specification in place or will need to undergo a new re-accreditation audit again in 2020 after upgrading their existing simulator to meet the 2020 specifications.

It may not be possible to upgrade a centre’s existing equipment to meet the January 2020 specifications. It could be that the manufacturer doesn’t offer the required upgrade or hardware/software issues prevent an upgrade. On a case by case basis, NI may grant exemptions to January 2020 specification items where equipment, in place when this specification comes in effect, cannot be upgraded.

Simulator Class A		
Item	NI Requirement	Link to Failure Mode Checklist or Course Content
Table 1	Physical realism:	
101A	Equipment and consoles are to be installed, mounted, and arranged in a ship-like manner.	
102A	The DP simulator shall be installed, where necessary information sources, such as indicators, displays, alarm panels, control panels and communication systems are also installed.	
The following DP related equipment shall at least be included in the simulator:		
103A	A DP Class 2 Control System, from a manufacturer with a system installed on at least one vessel certified by a class society. Emulated systems are not permitted.	
104A	A realistic Human Machine Interface ("DP desk") is required. A set of 2-axis joystick and turn control knob (or 3-axis	Induction 74 except for realistic HMI & Simulation 2.5.

	joystick) is mandatory.	
105A	Manual control; Single thruster levers and thruster indicators for each thruster or group of thrusters, available for user on the simulator.	
106A	Emergency stop control s for all thrusters located close to DP simulator consoles. The Emergency Stop device does not need to be integrated to the simulator.	Failure Mode 1
107A	The thruster control mode, i.e. DP, Manual, should be selectable by a simple device located close to DP Simulator consoles.	
108A	The DP system shall include the following operational modes: - Manual Mode (Joystick control of Surge, Sway & Yaw); - Mixed Manual /Automatic Mode (Automatic control of Yaw with Joystick control of Surge & Sway, and Automatic control of Surge & Sway with Joystick/knob control of Yaw); - Automatic Mode (Automatic control of Surge, Sway & Yaw) - Track Follow Mode (Automatic control of Surge, Sway & Yaw while following a predetermined track via waypoints) - Follow-Target Mode (e.g. ROV Follow where the vessel to maintains position relative to a moving target, usually an underwater vehicle) DP systems where automatic control of Surge & Sway is selected jointly rather than independently, meet the requirements of this item.	Induction 78 & Simulation 1.1.
109A	A minimum thruster arrangement set shall be made available, with at least the minimum below: - Tunnel thruster & azimuth thruster or main propulsion with rudder. Other thruster arrangements, that meet the same needs, are acceptable. The Thruster arrangement Set shall reflect Ship Model, DP Operation and DP system class, so Training Provider should have the stated above depending on the simulated Operation being carried out during the training. This requirement can be met by using multiple simulated	Failure Mode 11

	vessels.	
110A	A DP Power generation view showing status, load, power on buses, generators and bus ties (The view can be a presentation within the DP system.)	Simulator course 1.2
111A	At least 3 independent position-reference systems with operator interface, based on different principles.	Failure Mode 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39. Note that as only DGNSS & HPR are absolute requirements (Item 117A), some failure modes for the reference systems may not be possible as the specification requires only a total of 3 references to be fitted.
112A	An Electronic Field Chart System, or ECDIS / ECS system adapted to represent it. Paper plans can be used but cannot replace the Electronic Field Chart required above. The Field shall represent realistic offshore structures. (Required by January 2020.)	Failure Mode 24, 26. Operators have to know where objects are to determine fault. Possibly by ECDIS or visual or both.
113A	A DP status alert system (“traffic lights”) for e.g. alerting dive control or drill floor etc., in 4 colors, or the colors used for specific operation guidelines: Green, White/Blue, Yellow and Red. The lights may not be integrated on the simulator system, but clearly visible to the instructor during the exercise. (White/Blue light required by January 2020.)	
114A	An Alarm printer for DP or an electronic means of recording the same information.	
115A	Specification sheets for each own ship for the purpose of planning DP operations. (These are to include vessel dimensions, particulars related to installed power, thruster characteristics /power and information relating to any thruster modes the vessel may have.)	Simulator course 2.2
116A	Vessel plans for the purpose of planning DP operations. (Plans need to at least show location of pre-programmed rotation points, reference system locations and thruster locations.) Also, Capability diagrams for each own ship. (These can either be on paper or generated electronically by	Simulation 2.1 & 2.2

	the DP system.)	
The following inputs to the DP system shall at least be simulated:		
117A	3 independent position-reference systems based on different principles, where one shall be a DGNSS and one shall be HPR. The other PRS may be adapted to the operation being simulated. (DGNSS, Differential Global Navigation Satellite System). ROV Follow in Item 108A, Item 607A and Item 608A make HPR a required reference system. (HPR required by January 2020.)	Failure Mode 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39. Note that as only DGNSS & HPR are absolute requirements, some failure modes for the reference systems may not be possible as the specification requires only a total of 3 references to be fitted.
118A	3 independent vertical reference sensors (VRS) (Required by January 2020.)	Failure Mode 21, 22
119A	3 independent heading sensors , e.g. gyro compasses	Failure Mode 17,18, 19, 20
120A	2 independent wind sensors	Failure Mode 12, 13, 14, 15, 16
121A	1 draught sensor or manual draught input	
122A	Thruster status and feedback	Failure Mode 1, 2, 3, 4, 5, 6, 7, 8, 9. Simulator course 3.4 (b)
123A	Generator load, generator circuit breakers and bus ties	Failure Mode 40, 41, 42, 43, 44, 45, 46, 47. Simulator course 2.2
The following bridge related equipment shall at least be included in the simulator:		
124A	A radio to simulate external and Internal radio communications (according to the operation being simulated) - An internal communication system, e.g. a talk-back system to areas such as ROV control and telephone, to areas such as ECR (engine control room) and other areas of the vessel.	Simulation 2.7 but no requirement for multiple means of communication.
125A	At least one digital gyro repeater	
126A	At least one Radar/ARPA display/unit (Automatic Radar Plotting Aid) with the functionality of a type approved system	
127A	ECDIS (Electronic Chart Display and Information System) or ENC (Electronic Navigation Chart). This item is in addition to an ECDIS/ENC that may be used to comply with Item 112A. (Required by January 2020.)	Simulator course 2.2
128A	Water depth indicator (may be emulated)	
129A	Speed log repeater showing speed through the water and in	

	addition speed and distance over ground (may be emulated)	
130A	At least one wind indicator showing wind- direction and speed (may be emulated)	
131A	Sound panel or interface to issue navigational sounds according to the International Collision Regulation Rules (may be emulated)	
132A	Instrument for indication of navigational lights (may be emulated)	
133A	Control system for fire detection, fire alarm and lifeboat alarm (may be emulated)	
134A	AIS (Automatic Identification System) (may be emulated) AIS displayed on ECDIS or ECS is sufficient to meet this requirement.	
Table 2	Behavioural realism:	
201A	Position-reference systems should preferably be based on real equipment for the operator interface. Emulated systems may be accepted if similar interface, functionality and indications are present.	
202A	Monitoring of positioning reference systems on the DP system shall include realistic alarms for any typical fault or failure condition.	Failure Mode 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39. Simulator course 1.2
203A	Position-reference systems shall provide new position data with a realistic refresh rate and accuracy.	
204A	Monitoring of sensors on the DP system, shall include realistic alarms for any typical fault or failure condition.	Failure Mode 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22. Simulator course 2.12 and 3.2
205A	The dynamic positioning control systems shall perform a consequence analysis of the ability to maintain position after worst case failures. An alarm shall be initiated, in regular intervals, when a failure will cause loss of position in the prevailing weather conditions. User shall be able to activate and de-activate the consequence analysis.	
206A	The simulation of own ship shall be based on a mathematical	This is based on DP principles.

	model with 6 degrees of freedom.	
207A	The model shall realistically simulate own ship hydrodynamics in open water conditions, including the effects of wind forces, wave forces, tidal stream and currents.	Linked to item 206A
208A	The simulator shall simulate the event of a contact/collision with other vessels/structures with a clear indication that contact has occurred. This need not be automatic. Manual freezing of the visuals, by the instructor, is sufficient to meet this requirement. (Required by January 2020.)	
209A	The simulator/simulators of the training provider should have the possibility to simulate at least 3 DP operations, such as: Supply, ROV survey, cable lay, pipe lay, trenching, rock dumping, dive support, drilling, offshore loading operations and other offshore operations, where required, using the DP modes contained on 108A and the adequate Thruster Arrangement Set, according to DP Operation, Ship Model and DP Class being simulated, as stated on 109A.	Failure Mode 10, 55
210A	The radar simulation equipment shall be capable of modelling weather, shadow sectors, spurious echoes and other propagation effects, and generate coastlines , navigational buoys and search and rescue transponders in addition to vessels and installations in the operational area (type approved characteristics)	
211A	The electronic field chart, or ECDIS/ECS adapted (Item 112A), shall include platforms and subsea equipment and present a real time update of vessel position and heading with an outline of the vessel to scale.	Failure Mode 24, 26 and Simulator course 2.2. Operators have to know where objects are to determine fault. Possibly by ECDIS or visuals or both.
212A	The simulator shall provide an own ship engine and thruster sound, reflecting the power output appropriate to vessel type.	
213A	The simulator shall be able to work either in Geographic (latitude/longitude) or in UTM (Universal Transverse Mercator) coordinates.	

Table 3		Operating environment:
Target ships:		
301A	The simulator must display other appropriate target vessels.	
302A	The simulator must display at least 2 different installations of different types. The level of perception/details shall be high to allow for realistic operations at close range. The platforms should be illuminated at night.	
303A	The target ships shall be equipped with navigational-lights, shapes and sound signals, according to the International Regulations for Preventing Collisions at Sea. Each ship should have an aspect recognizable at a distance of 6 nautical miles in clear weather. A ship under way shall provide relevant bow and stern wave.	
Outside view:		
304A	The simulator shall provide a realistic visual scenario by day, dusk or by night, including variable meteorological visibility, changing in time. It shall be possible to create a range of visual conditions, from dense fog to clear.	Failure Mode 24, 26. Operators have to know where objects are to determine fault. Possibly by ECDIS or visuals or both.
305A	The visual system and/or a motion platform shall replicate movements of ships according to 6 degrees of freedom.	
306A	The visual system shall present all navigational marks according to charts used.	
307A	The visual system shall present the outside world by a view around the horizon (360 degrees by panning the view). The horizontal field of view may be obtained by a view of at least 210 degrees, where the rest of the horizon may be panned (to move the "camera"). In case the simulator is configured to fit a "rear view" only, is acceptable a 180 degree of visualization.	
308A	Simulated sea state visualization shall align with any changes in simulated weather.	

	(Required by January 2020.)	
Outside sound:		
309A	The simulator shall be capable of providing environmental sound (e.g. wind) according to conditions simulated.	
Navigated waters/Environmental forces:		
310A	The navigated waters shall include a current pattern, changeable in time, according to the charts used. Tidal current shall be reflected. Manual current entry, by the instructor, is sufficient to meet this requirement.	Failure Mode 50, 51, 52
311A	The simulation shall include the depth according to charts used, reflecting water level according to tidal water situation.	Failure Mode 32
312A	The simulator shall provide waves, variable in direction, period and height.	Failure mode 50, 51, 52, 53, 54
313A	The simulator shall provide wind force, variable in direction and speed.	Failure Mode 50, 51, 52, 53, 54. Simulator course 1.2
314A	Environmental forces, current, waves and wind, shall be possible to enter both as an immediate change, and with a change time. In addition it shall be possible to back (counter-clockwise) or to veer (clockwise) the environmental forces.	Failure Mode 50, 51, 52, 53, 54. Simulator course 1.2
Table 4	Simulator control:	
401A	The simulator shall include suitable instructor facilities where exercises are normally controlled. This facility shall be separated from where the students are conducting the exercise/operation.	
402A	The instructor shall, by any method, be able to monitor key parameters of the exercise for debriefing and analysis purposes. If trends are not available, instructor shall provide means to capture key parameters.	
403A	The simulator shall include possibilities to set the exercise to any position in the playback and be able to continue the exercise from the set time. Note: When real equipment is interfaced, e.g. the DP system, it is accepted that the real equipment may not be able to jump in time and place	

	without allowing time to reset data and build new model.	
The following equipment shall at least be included in the simulator control:		
404A	DP computer facility for the instructor to monitor and control the operation of the simulator. (Including items in Tables 5 & 6)	To set student's simulator
405A	DP computer facility for instructor to monitor the DP system settings independently – to check DP settings used by the students.	To set student's simulator
406A	Slave monitors for each DP operator station in the bridge (Remotely Visualization software through network may be accepted. Video splitters of the DP system monitors may also be used. Cameras would not be acceptable.) To be able to observe the students use of the DP operator stations.	To set student's simulator
407A	Monitoring panel for thruster emergency-stop if not integrated automatically in the simulator, or means to clearly identify the command.	Failure Mode 1
408A	Monitoring panel for DP status alert switch (traffic light) or an indication of alert switch status by other means in the simulator control.	Linked to 113A where instructor will be able to see what action student has undertaken.
409A	Communication equipment as on the bridge (as per GMDSS Area 1). Here a VHF DSC is required. (Required by January 2020.)	Simulator course 2.7
410A	Video and sound monitoring equipment. Where the simulator & simulator control are in adjoining rooms, 1 way glass may be used in lieu of video monitoring equipment. (Hear and see student's reactions /discussions)	
411A	Slave screen to monitor the horizontal field of view, preferably with a means to pan 360 degrees.	
Table 5	Failure modes:	
501A	The instructor shall be able to introduce faults for the DP system. Faults and their characteristics should be able to be defined in advance or introduced/changed while the	Simulation 2.12, 3.2 and 3.4.

	simulation is running. Fault characteristics shall be appropriate for the system/device/operation being modelled.	
For the simulated signals (thrusters, generators, sensors, PRS etc.), the following failure modes shall at least be included in the simulator control and applied as appropriate:		
502A	Random noise, e.g. for PRS (position-reference system); jumps in metres in two axis (latitude and longitude)	Failure Mode 25,28,29,37. Simulator course 3.4 (e)
503A	Drift, with drift speed and limit, e.g. for PRS; drift in two axis (latitude and longitude)	Failure Mode 17, 18. Simulator course 3.4 (e)
504A	Bias, as appropriate	Failure Mode 12, 13, 14, 15, 21, 30, 33
505A	Oscillation, with value and period	If that is related to delay and interference, so it would be related to items 5, 6, 29 and 30 in the Failure Mode
506A	Freeze signal to existing value	Failure Mode 6, 23. Simulator course 3.4
507A	Stop of signal	Failure Mode 16,19,20,22,24,25,26,27,28,31,34,36,39. Simulator course 3.4 (c) (d)
508A	Fixed value, (feedback and set point), e.g. thruster runaway with setting in percent	Failure Mode 1, 2, 3, 5. Simulator course 3.4 (a)
Table 6	Other simulator control functions:	
Simulator control - Power management:		
601A	The simulator shall be able to start and stop individual generators.	Failure Mode 40, 41, 42, 43, 44, 45, 46, 47. Simulator course 1.2
602A	The simulator shall be able to open/close generator circuit breakers and bus ties.	Failure Mode 40, 41, 45, 46. Simulator course 1.2
603A	The simulator shall be able to define unspecified external load (e.g. drilling load) on individual power buses.	Simulator course 1.2
Simulator control - External forces:		
604A	Where appropriate for the DP operation being simulated, the simulator shall be able to introduce external forces, specified per requirement, e.g.: Force, direction in degrees , setting for constant direction true or relative, point of attack (Surge and Sway).	Failure Mode 56
Simulator control - Position-reference systems:		
605A	Transponder coordinates for any position reference system,	

	(i.e. laser reflector, hydro acoustic transponder, radar-based transponder), should be possible to enter either as an absolute coordinate or relative to the vessel.	
606A	Hydro acoustic systems shall be possible to be operated in LBL (Long Baseline) or SSBL (Super Short Baseline)/ USBL (Ultra Short Baseline) – as appropriate for the hydro acoustics system and operation being simulated.	
607A	It shall be possible to simulate mobile or fixed hydro acoustic transponders, where appropriate for the intended DP operation. (Mobile transponder is required for ROV Follow specified in item 108A.)	Linked to 608A and Failure Mode 10
608A	The simulator control shall have a function to simulate an ROV or similar, by moving mobile hydro acoustic transponder(s). The simulator shall be capable of simulating at least 1 mobile transponder at any given time. (Mobile transponder is required for ROV Follow specified in 108A.)	Failure Mode 10
Table 7	Shuttle tanker specific requirements:	
701A	If the simulator contains a shuttle tanker model, it shall be able to visually present at least 3 different loading facilities for offshore loading, where an FPSO (floating production, storage and off-loading vessel) in tandem loading shall be one of them. The behaviour of such model shall reflect realistically a tanker with the special view of manoeuvring during approach and loading.	
702A	For a shuttle tanker one external force shall be integrated to a hawser tension sensor.	Failure Mode 56
703A	For a shuttle tanker in tandem loading at least one absolute and one relative position-reference systems shall be simulated.	Failure Mode 38, 39

Simulator Class B

Item	NI Requirement	Link to Failure Mode Checklist or Course Content
Table 1	Physical realism:	
101B	The DP simulator shall be installed, where necessary information sources, such as indicators, displays, alarm panels, control panels and communication systems are also installed.	
The following DP related equipment shall at least be included in the simulator:		
102B	A DP Class 2 Control System, from a manufacturer with a system installed on at least one vessel certified by a class society. (Emulated systems are permitted if they are approved by a class society, meet the requirements of this standard and resemble a real system fitted to a vessel.)	
103B	A realistic Human Machine Interface ("DP desk") is required. A set of 2-axis joystick and turn control knob (or 3-axis joystick) is mandatory.	Induction 74 except for realistic HMI & Simulation 2.5.
104B	Emergency stop controls for all thrusters located close to DP simulator consoles. The Emergency Stop device does not need to be integrated to the simulator.	Failure Mode 1
105B	The DP system shall include the following operational modes: - Manual Mode (Joystick control of Surge, Sway & Yaw); -	Induction 78 & Simulation 1.1.

	<p>Mixed Manual /Automatic Mode (Automatic control of Yaw with Joystick control of Surge & Sway, and Automatic control of Surge & Sway with Joystick/knob control of Yaw); - Automatic Mode (Automatic control of Surge, Sway & Yaw) - Track Follow Mode (Automatic control of Surge, Sway & Yaw while following a predetermined track via waypoints) - Follow-Target Mode (e.g. ROV Follow where the vessel to maintains position relative to a moving target, usually an underwater vehicle)</p> <p>DP systems where automatic control of Surge & Sway is selected jointly rather than independently, meet the requirements of this item.</p>	
106B	<p>A minimum thruster arrangement set shall be made available, with at least the minimum below: - Tunnel thruster & azimuth thruster or main propulsion with rudder. Other thruster arrangements, that meet the same needs, are acceptable. The Thruster arrangement Set shall reflect Ship Model, DP Operation and DP system class, so Training Provider should have the stated above depending on the simulated Operation being carried out during the training. This requirement can be met by using multiple simulated vessels.</p>	Failure Mode 11
107B	<p>A DP Power generation view showing status, load, power on buses, generators and bus ties (The view can be a presentation within the DP system.)</p>	Simulator course 1.2
108B	<p>An Electronic Field Chart System, or ECDIS / ECS system adapted to represent it. Paper plans can be used but cannot replace the Electronic Field Chart required above. The Field shall represent realistic offshore structures. (Required by January 2020.)</p>	Failure Mode 24, 26. Operators have to know where objects are to determine fault. Possibly by ECDIS or visual or both.
109B	<p>A DP status alert system (“traffic lights”) for e.g. alerting dive control or drill floor etc., in 4 colors, or the colors used for specific operation guidelines: Green, White/Blue, Yellow and</p>	

	Red. The lights may not be integrated on the simulator system, but clearly visible to the instructor during the exercise. (White/Blue light required by January 2020.)	
110B	An Alarm printer for DP or an electronic means of recording the same information.	
111B	Specification sheets for each own ship for the purpose of planning DP operations. (These are to include vessel dimensions, particulars related to installed power, thruster characteristics /power and information relating to any thruster modes the vessel may have.)	Simulator course 2.2
112B	Vessel plans for the purpose of planning DP operations. (Plans need to at least show location of pre-programmed rotation points, reference system locations and thruster locations.) Also, Capability diagrams for each own ship. (These can either be on paper or generated electronically by the DP system.)	Simulation 2.1 & 2.2
The following inputs to the DP system shall at least be simulated:		
113B	3 independent position-reference systems based on different principles, where one shall be a DGNSS and one shall be HPR. The other PRS may be adapted to the operation being simulated. (DGNSS, Differential Global Navigation Satellite System). ROV Follow in Item 105B, Item 607B and Item 608B make HPR a required reference system. (HPR required by January 2020.)	Failure Mode 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39. Note that as only DGNSS & HPR are absolute requirements, some failure modes for the reference systems may not be possible as the specification requires only a total of 3 references to be fitted.
114B	3 independent vertical reference sensors (VRS) (Required by January 2020.)	Failure Mode 21, 22
115B	3 independent heading sensors , e.g. gyro compasses	Failure Mode 17,18, 19, 20
116B	2 independent wind sensors	Failure Mode 12, 13, 14, 15, 16
117B	1 draught sensor or manual draught input	
118B	Thruster status and feedback	Failure Mode 1, 2, 3, 4, 5, 6, 7, 8, 9. Simulator course 3.4 (b)
119B	Generator load, generator circuit breakers and bus ties	Failure Mode 40, 41, 42, 43, 44, 45, 46, 47. Simulator course 2.2
The following bridge related equipment shall at least be included in the simulator:		

120B	A radio to simulate external and Internal radio communications (according to the operation being simulated) - An internal communication system, e.g. a talk-back system to areas such as ROV control and telephone, to areas such as ECR (engine control room) and other areas of the vessel.	Simulation 2.7 but no requirement for multiple means of communication.
Table 2	Behavioural realism:	
201B	Monitoring of positioning reference systems on the DP system shall include realistic alarms for any typical fault or failure condition.	Failure Mode 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39. Simulator course 1.2
202B	Position-reference systems shall provide new position data with a realistic refresh rate and accuracy.	
203B	Monitoring of sensors on the DP system, shall include realistic alarms for any typical fault or failure condition.	Failure Mode 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22. Simulator course 2.12 and 3.2
204B	The dynamic positioning control systems shall perform a consequence analysis of the ability to maintain position after worst case failures. An alarm shall be initiated, in regular intervals, when a failure will cause loss of position in the prevailing weather conditions. User shall be able to activate and de-activate the consequence analysis.	
205B	The simulation of own ship shall be based on a mathematical model with 6 degrees of freedom.	This is based on DP principles.
206B	The model shall realistically simulate own ship hydrodynamics in open water conditions, including the effects of wind forces, wave forces, tidal stream and currents.	Linked to item 205B
207B	The simulator shall simulate the event of a contact/collision with other vessels/structures with a clear indication that contact has occurred. This need not be automatic. Manual freezing of the visuals, by the instructor, is sufficient to meet this requirement. (Required by January 2020.)	
208B	The simulator/simulators of the training provider should have the possibility to simulate at least 3 DP operations, such as: Supply, ROV survey, cable lay, pipe lay, trenching, rock	Failure Mode 10, 55

	dumping, dive support, drilling, offshore loading operations and other offshore operations, where required, using the DP modes contained on 105B and the adequate Thruster Arrangement Set, according to DP Operation, Ship Model and DP Class being simulated, as stated on 106B.	
209B	The electronic field chart, or ECDIS/ECS adapted (Item 108B), shall include platforms and subsea equipment and present a real time update of vessel position and heading with an outline of the vessel to scale.	
210B	The simulator shall be able to work either in Geographic (latitude/longitude) or in UTM (Universal Transverse Mercator) coordinates.	
Table 3	Operating environment:	
Target ships:		
301B	The simulator must display other appropriate target vessels.	
302B	The simulator must display at least 2 different installations of different types. The level of perception/details shall be high to allow for realistic operations at close range. The platforms should be illuminated at night. (ITEM RECOMMENDED)	
303B	The target ships shall be equipped with navigational-lights, according to the International Regulations for Preventing Collisions at Sea. (ITEM RECOMMENDED)	
Outside view:		
304B	The simulator shall provide a realistic visual scenario by day, dusk or by night, including variable meteorological visibility, changing in time. It shall be possible to create a range of visual conditions, from dense fog to clear.	Failure Mode 24, 26. Operators have to know where objects are to determine fault. Possibly by ECDIS or visuals or both.
305B	For Class B, a visual system is required to increase realism and learning outcome. A visual system for Class B shall have a horizontal field of view of a single visual channel. Horizontally, the visual system for Class B shall be able to be panned 360 degrees.	
306B	Simulated sea state visualization shall align with any changes	

	in simulated weather. This need not be automatic. Manual entry of sea state parameters, by the instructor, is sufficient to meet this requirement. (Required by January 2020.)	
Environmental conditions:		
307B	The navigated waters shall include a current pattern (speed and direction) that can be manually entered by the instructor.	Failure Mode 50, 51, 52
309B	The simulator shall provide waves, variable in direction, period and height.	Failure mode 50, 51, 52, 53, 54
310B	The simulator shall provide wind force, variable in direction and speed.	Failure Mode 50, 51, 52, 53, 54. Simulator course 1.2
311B	Environmental forces, current, waves and wind, shall be possible to enter both as an immediate change, and with a change time. In addition it shall be possible to back (counter-clockwise) or to veer (clockwise) the environmental forces.	Failure Mode 50, 51, 52, 53, 54. Simulator course 1.2
Table 4	Simulator control:	
401B	The simulator shall include suitable instructor facilities where exercises are normally controlled. This facility shall be separated from where the students are conducting the exercise/operation.	
402B	The instructor shall, by any method, be able to monitor key parameters of the exercise for debriefing and analysis purposes. If trends are not available, instructor shall provide means to capture key parameters.	
The following equipment shall at least be included in the simulator control:		
403B	DP computer facility for the instructor to monitor and control the operation of the simulator. (Including items in Tables 5 & 6)	To set student's simulator
404B	DP computer facility for instructor to monitor the DP system settings independently – to check DP settings used by the students.	To set student's simulator
	Slave monitors for each DP operator station in the bridge	To set student's simulator

405B	(Remotely Visualization software through network may be accepted. Video splitters of the DP system monitors may also be used. Cameras would not be acceptable.) To be able to observe the students use of the DP operator stations.	
406B	Monitoring panel for thruster emergency-stop if not integrated automatically in the simulator, or means to clearly identify the command.	Failure Mode 1
407B	Monitoring panel for DP status alert switch (traffic light) or an indication of alert switch status by other means in the simulator control.	Linked to 109B where instructor will be able to see what action student has undertaken.
408B	Video and sound monitoring equipment. Where the simulator & simulator control are in adjoining rooms, 1 way glass may be used in lieu of video monitoring equipment. (Hear and see student's reactions/discussions)	
409B	Slave screen to monitor the horizontal field of view, preferably with a means to pan 360 degrees.	
Table 5	Failure modes:	
501B	The instructor shall be able to introduce faults for the DP system. Faults and their characteristics should be able to be defined in advance or introduced/changed while the simulation is running. Fault characteristics shall be appropriate for the system/device/operation being modelled.	Simulation 2.12, 3.2 and 3.4.
For the simulated signals (thrusters, generators, sensors, PRS etc.), the following failure modes shall at least be included in the simulator control and applied as appropriate:		
502B	Random noise, e.g. for PRS (position-reference system); jumps in metres in two axis (latitude and longitude)	Failure Mode 25,28,29,37. Simulator course 3.4 (e)
503B	Drift, with drift speed and limit, e.g. for PRS; drift in two axis (latitude and longitude)	Failure Mode 17, 18. Simulator course 3.4 (e)
504B	Bias, as appropriate	Failure Mode 12, 13, 14, 15, 21, 30, 33
505B	Oscillation, with value and period	If that is related to delay and interference, so it would be related to items 5, 6, 29 and 30 in the Failure Mode
506B	Freeze signal to existing value	Failure Mode 6, 23. Simulator course 3.4

507B	Stop of signal	Failure Mode 16,19,20,22,24,25,26,27,28,31,34,36,39. Simulator course 3.4 (c) (d)
508B	Fixed value, (feedback and set point), e.g. thruster runaway with setting in percent	Failure Mode 1, 2, 3, 5. Simulator course 3.4 (a)
Table 6	Other simulator control functions:	
Simulator control - Power management:		
601B	The simulator shall be able to start and stop individual generators.	Failure Mode 40, 41, 42, 43, 44, 45, 46, 47. Simulator course 1.2
602B	The simulator shall be able to open/close generator circuit breakers and bus ties.	Failure Mode 40, 41, 45, 46. Simulator course 1.2
603B	The simulator shall be able to define unspecified external load (e.g. drilling load) on individual power buses.	Simulator course 1.2
Simulator control - External forces:		
604B	Where appropriate for the DP operation being simulated, the simulator shall be able to introduce external forces, specified per requirement, e.g.: Force, direction in degrees , setting for constant direction true or relative, point of attack (Surge and Sway).	Failure Mode 56
Simulator control - Position-reference systems:		
605B	Transponder coordinates for any position reference system, (i.e. laser reflector, hydro acoustic transponder, radar-based transponder), should be possible to enter either as an absolute coordinate or relative to the vessel. (ITEM RECOMMENDED)	
606B	The simulator shall be able to carry out hydro acoustic position reference system operations.	
607B	It shall be possible to simulate mobile or fixed hydro acoustic transponders, where appropriate for the intended DP operation. (Mobile transponder is required for ROV Follow specified in item 105B.)	Linked to 608B and Failure Mode 10

608B	The simulator control shall have a function to simulate an ROV or similar, by moving mobile hydro acoustic transponder(s). The simulator shall be capable of simulating at least 1 mobile transponder at any given time. (Mobile transponder is required for ROV Follow specified in 105B.)	Failure Mode 10
Table 7	Shuttle tanker specific requirements:	
701B	If the simulator contains a shuttle tanker model, it shall be able to visually present at least 3 different loading facilities for offshore loading, where an FPSO (floating production, storage and off-loading vessel) in tandem loading shall be one of them. The behavior of such model shall reflect realistically a tanker with the special view of manoeuvring during approach and loading.	
702B	For a shuttle tanker one external force shall be integrated to a hawser tension sensor.	Failure Mode 56
703B	For a shuttle tanker in tandem loading at least one absolute and one relative position-reference systems shall be simulated.	Failure Mode 38, 39
Simulator Class C		
Item	NI Requirement	Link to Failure Mode Checklist or Course Content
Table 1	Physical realism:	
The following DP related equipment shall at least be included in the simulator:		
101C	A DP Class 1 Control System, from a manufacturer with a system installed on at least one vessel certified by a class society. (Emulated systems are permitted if they are approved by a class society, meet the requirements of this standard and resemble a real system fitted to a vessel.)	

102C	A realistic Human Machine Interface ("DP desk") is required. A set of 2-axis joystick and turn control knob (or 3-axis joystick) is mandatory.	Induction 74 except for realistic HMI & Simulation 2.5.
103C	The DP system shall include the following operational modes: - Manual Mode (Joystick control of Surge, Sway & Yaw); - Mixed Manual /Automatic Mode (Automatic control of Yaw with Joystick control of Surge & Sway, and Automatic control of Surge & Sway with Joystick/knob control of Yaw); - Automatic Mode (Automatic control of Surge, Sway & Yaw) - Track Follow Mode (Automatic control of Surge, Sway & Yaw while following a predetermined track via waypoints) - Follow-Target Mode (e.g. ROV Follow where the vessel to maintains position relative to a moving target, usually an underwater vehicle) DP systems where automatic control of Surge & Sway is selected jointly rather than independently, meet the requirements of this item.	Induction 78
104C	A minimum thruster arrangement set shall be made available, with at least the minimum below: - Tunnel thruster & azimuth thruster or main propulsion with rudder. Other thruster arrangements, that meet the same needs, are acceptable. The Thruster arrangement Set shall reflect Ship Model, DP Operation and DP system class, so Training Provider should have the stated above depending on the simulated Operation being carried out during the training. This requirement can be met by using multiple simulated vessels.	
105C	A DP Power generation view showing status, load, power on buses, generators and bus ties (The view can be a presentation within the DP system.)	
The following inputs to the DP system shall at least be simulated:		
106C	3 independent position-reference systems based on different principles, where one shall be a DGNSS and one shall be HPR.	

	The other PRS may be adapted to the operation being simulated. (DGNSS, Differential Global Navigation Satellite System). ROV Follow in Item 103C makes HPR a required reference system. (HPR required by January 2020.)	
107C	3 independent vertical reference sensors (VRS) (Required by January 2020.)	
108C	3 independent heading sensors , e.g. gyro compasses	
109C	2 independent wind sensors	
111C	Thruster status and feedback	
112C	Generator load, generator circuit breakers and bus ties	
Table 2	Behavioral realism:	
201C	Monitoring of positioning reference systems on the DP system shall include realistic alarms for any typical fault or failure condition.	
202C	Position-reference systems shall provide new position data with a realistic refresh rate and accuracy.	
203C	Monitoring of sensors on the DP system, shall include realistic alarms for any typical fault or failure condition.	
204C	The simulation of own ship shall be based on a mathematical model with 6 degrees of freedom.	This is based on DP principles.
205C	The model shall realistically simulate own ship hydrodynamics in open water conditions, including the effects of wind forces, wave forces, tidal stream and currents.	Linked to item 204
Table 3	Operating environment:	
Navigated waters/Environmental forces:		
301C	The simulator shall provide wind force, direction and speed.	
302C	The Class C (DP) simulator shall be able to set wind and current (direction and speed).	

APPENDIX F – ADMINISTRATION REQUIREMENTS

General

- a) The centre shall have a licence document showing that it is legally eligible to operate as a training centre.
- b) Joint venture agreements between a training centre and satellite centres or two independent companies shall be required by The Nautical Institute for analysis prior to the accreditation visit. No financial information is required by The Nautical Institute.
- c) Each centre must have a stamp with that centre's name and logo to be used for stamping logbooks. DP centres that are in a joint venture must have the name and logo of both the centres on the one stamp. Centres that are operating as satellite centres must each have their own stamp.

1. COURSE BOOKING SYSTEM

There should be a booking system procedure clearly documented, demonstrating all the booking phases and feedback to students before commencing the course.

Training centres are required to ask for the Certificate of Competence (CoC) of their students before accepting them into the DP Induction course and DP scheme. An electronic copy of the STCW CoC for each student shall be kept in files for audits.

An out of date Certificate of Competency (CoC) does not stop students commencing the DP scheme. However, training centres should provide full guidance to these students as they may find difficulties in obtaining the sea service required by the scheme if they hold an invalid CoC.

The Certificate of Competence number should be noted and properly recorded by the centre in the student record as well as in the logbook provided to them.

The Nautical Institute will require a certified copy of the Certificate of Competence when receiving their application to cross-check the information.

Officer trainees should present proof, such as a letter from the company employing them or their college, indicating that they are on STCW training before joining the Induction course and should be instructed by the training centre that they are not able to undertake the Simulator course and DP watchkeeping time until they hold a STCW certificate of competency.

Trainee DPOs or Officer trainees who have started the DP scheme after 1 January 2012 and do not follow the conditions above will have their courses or training invalidated by The Nautical Institute.

Non-STCW students (those who do not fit into the STCW regulation, such as Ballast Control Operator, Barge Supervisor or Offshore Managers and/or other non-Certificate of Competence qualified operators):

The Nautical Institute understands that the Induction course is sought by many people who do not have a Certificate of Competence and are outside the scope of STCW. Training centres accredited by The Nautical Institute will be authorised to accept them into the Induction course under the following conditions:

- The Induction course has to be delivered with a new title such as 'DP awareness' and not Induction course as it states in the NI DP scheme; The Institute asks centres not to use any name for the new course that might create confusion or similarity with the DP scheme. Example: DP Familiarisation.
- The certificate for this course (DP Awareness) cannot have the logo of The Nautical Institute on it.

- These students cannot obtain the NI logbook after the course.
- These students cannot do the NI online assessment after the DP Awareness course as the assessment is only applicable for those who are part of The Nautical Institute DP scheme.
- These students will not be considered in any instance as part of the NI DP scheme. Therefore, they cannot apply for a NI DP certificate. In case they decide to obtain the STCW Certificate of Competence in future, they will have to take the Induction course stipulated by The Nautical Institute as part of the DP scheme. They will have to start the DP training from the beginning and follow the training sequence set up in the NI standard.

2. PROCESS AND PROCEDURES

2.1 Communication

Internal: Appropriate communication processes must be established within the centre to ensure timely and relevant exchange of information among instructors and between management and instructors.

External: The training centre is required to implement effective arrangements for communicating with students in relation to:

- a) Course information
- b) Enquiries, contracts or order handling, including amendments
- c) Customer feedback, including customer complaints.

General information to students must be properly documented and visible in a common area such as reception or kitchen facilities. For this purpose the centre is required to have a wall board where information can be visually and appropriately displayed.

3. HUMAN RESOURCES

3.1 General

The training centre shall have an organogram, showing department and personnel structure and roles where applicable.

CVs of instructors including photo ID and records of any training, education, skills and experience shall be documented and maintained by the centre administration.

3.2 Competence

The centre shall have a system in place to:

- a) Determine the necessary competence for personnel performing the training
- b) Provide training or take other actions to satisfy these needs
- c) Evaluate the effectiveness of the actions taken
- d) Ensure that its personnel are aware of the relevance and importance of their activities and how they contribute to the achievement of the quality of the course

3.3 Appraisals

The Centre shall put in place an appraisal system to assess staff skills and competence. Records of the implementation of this system shall be kept including actions taken for staff improvement.

4. FEEDBACK SYSTEM

4.1 Customer focus

Top management shall ensure that customer requirements are determined and met with the aim of enhancing customer satisfaction.

4.1.1 Customer feedback system

Feedback forms are intended to assess the general quality of the course, its content, teaching method, instructors, facilities and infrastructure, and the helpfulness/professionalism of staff. The feedback about instructors and related course information shall be used to nurture his/her annual appraisal and/or to improve course and teaching.

4.2 Annual review

The centre shall establish management reviews, monitoring and customer feedback systems to ensure its continuing suitability, adequacy and effectiveness. This review shall include assessing opportunities for improvement and the need for changes to the quality of the DP training scheme, including policies and objectives.

The review documents must include information on:

- a) Result of audits
- b) Customer feedback
- c) Process performance and equipment conformity
- d) Status of preventive and corrective actions
- e) Follow-up actions from previous management reviews
- f) Changes that could affect the quality management system
- g) Recommendations for improvement

The outputs expected from the reviews include:

- a) improvement of the effectiveness of the documentation and communication process;
- b) improvement of pass marks from students
- c) reduction in customer complaints

5. COMPLAINTS AND APPEALS

The centre shall have documented processes and procedures in place to deal with complaints and appeals.

6. DOCUMENTATION CONTROL

6.1 General

- a) Company policies/staff handbook should be properly documented.
- b) Procedures must be documented, showing effective planning, operation and control of its processes. All documents, forms, teaching material and slides must have version and dates to be easily traceable and replaced when required. Documents such as attendance lists and exercises shall also have the name and signature of the instructor who is teaching the course.

6.2 Control of documents

6.2.1 NI documents/ circulars and official messages

All NI documents must be collected and available to staff at any time. The centre needs to be able to show that the NI requirements were put in place and applied in the training centre procedures.

6.2.2 Documented procedures shall be established to define the controls needed:

- a) to approve documents prior to issue
- b) to review and update as necessary and re-approve documents
- c) to ensure that changes and the current revision status of documents are identified
- d) to ensure that relevant versions of applicable documents are available at points of use
- e) to ensure that documents remain legible and readily identifiable
- f) to prevent the unintended use of obsolete documents, and to apply suitable identification to them if they are retained for any purpose.

6.2.3 Control of records

Records shall be established and maintained to provide evidence of conformity to requirements and of the effective operation of the quality management system. Records shall remain legible, readily identifiable and retrievable. A documented procedure shall be established to define the controls needed for the identification, storage, protection, retrieval, retention time and disposition of records.

Documents are required to be stored for the time determined by local regulations or at least for a period of 3 years from the date of the NI audit, whichever is longer.

7. EQUIPMENT MAINTENANCE RECORDS

The training centre is required to maintain the DP equipment and systems (hardware and software) periodically according to the manufacturer's guidance. The maintenance shall be periodically reviewed by an authorised technician and documented accordingly. A copy of the maintenance contract and a record of the maintenance carried out must be available when the centre is audited.

APPENDIX G – TRAINING PROVIDER ANNUAL REPORT

As centres are not audited yearly, an annual report is required from all centres accredited by The Nautical Institute. This deadline for this is 31 January of each year. The report should include, as a minimum, the following:

TRAINING PROVIDER ANNUAL REPORT

A. CONFIRMATIONS:
1.Date report filed with NI: 2. Year for which report refers: 3.Centre Name (In Full. This should be the official registered name): 4.Address: 5.Date Last Audited and Accreditation/Reaccreditation Certificate Number with Validity: 6.Type of Simulators currently in use: 7.Name of contact person, date of birth, NI Customer Number, DP Certificate Number (if applicable), Nationality, Rank in the Company, Email Address, Alternate Email Address, phone and mobile number: 8.Comments on any changes in administrative and/or commercial set-up : 9.Date of last attendance of applicable RTP Meeting:
B.DETAILS OF CHANGES:
10.Details of any changes to address, telephone number etc during the year 11.Details of any changes in facilities, classrooms, equipment, simulator etc
C. INSTRUCTORS and LOGBOOK SIGNATORIES:
12.Details of any changes with instructors, CVs, training programmes etc: 13.Current List of NI Approved Instructors with dates of approval letters: 14 Confirmation of current logbook signatories with names and signature samples. (Comment if any changes and provide the signatures and names if new additions are made).
D. STUDENTS, DETAILS OF COURSES AND RESULTS:
15. Full list of <u>ALL</u> accredited DP courses run for the year (1 st January to 31 st December), dates, instructors name, names of students, nationality, date of birth, NI Log book number, IMCA Log Book Number (if applicable), marks achieved, result, and certificate number if any (This may be sent as an attachment in a tabulated format): 16. Summary of feedbacks / evaluation from students for all accredited DP courses. (This may be sent as an attachment in a tabulated format):
F. REMARKS AND COMMENTS:
17.List of other courses held at the centre (Non-Accredited DP Courses): 18.Outline of future planned developments: 19.Any comments for NI Evaluation:

APPENDIX H – COMPLAINT/APPEAL PROCEDURE

General enquiries and correspondence related to the DP Accreditation Standard should be directed to The Nautical Institute using the contact details below:

Accreditation and Training Department

The Nautical Institute
202 Lambeth Road, London - SE1 7LQ
United Kingdom

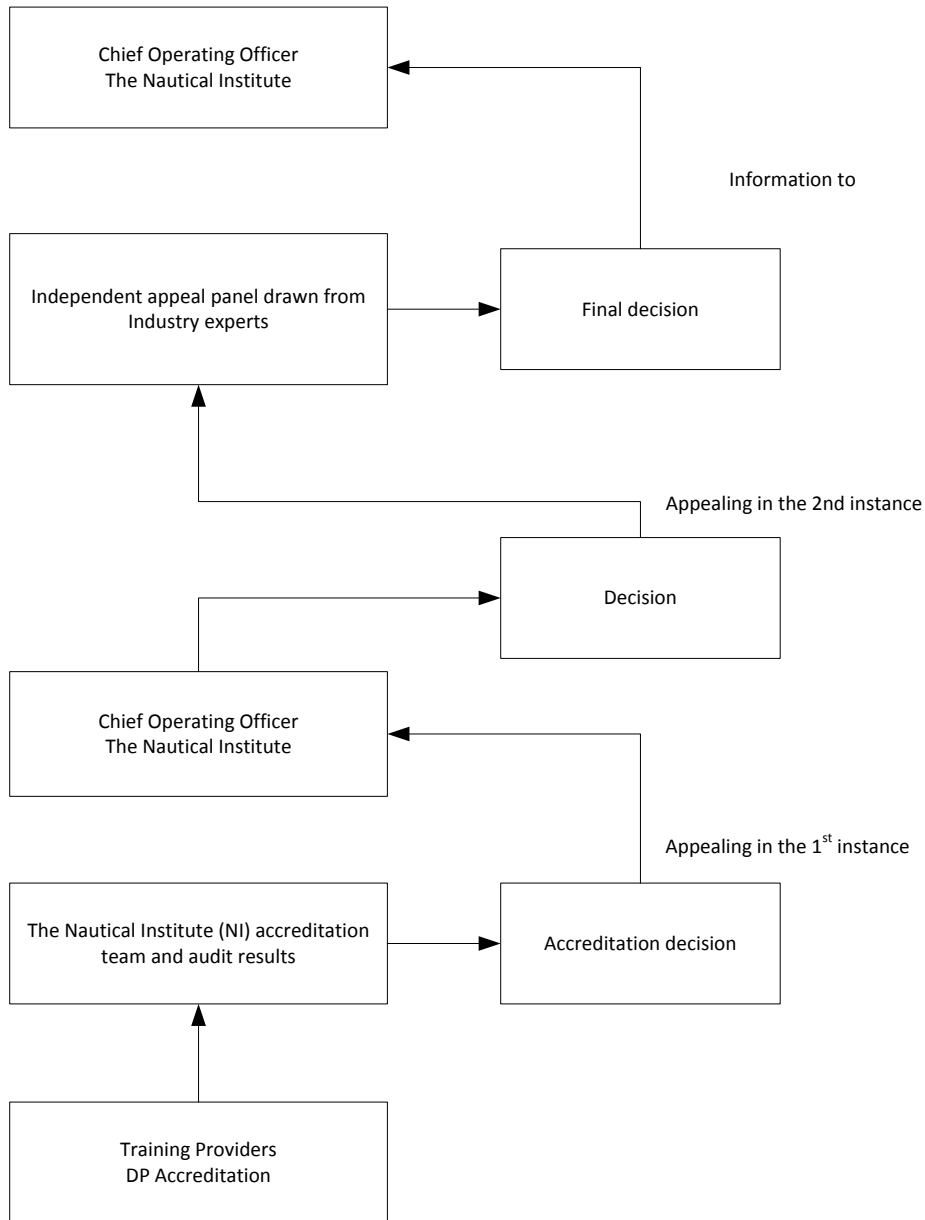
Email: accreditations@nautinst.org

Tel: +44 (0) 207 928 1351

Complaints and disputes related to the DP Accreditation Standard should be directed to The Nautical Institute using john.lloyd@nautinst.org. Acknowledgements will normally be made within seven days and a response given within 50 days. Matters escalated beyond the Accreditation and Training Department will be dealt with in accordance with the governance structure depicted on the next page.

Decisions supported by the Independent Panel will, in all matters, be considered final. Training centres should make every effort to ensure that all points raised at the closing meeting of the audit are understood and any questions discussed and clarified. Any complaints or appeals raised as a result of the accreditation visit will be subject to a resolution procedure, which may entail a re-visit to the centre with three auditors and this cost will be borne by the training centre as per the Accreditation agreement.

ACCREDITATION APPEAL PROCESS



GENERAL INSTRUCTIONS FOR THE APPEAL PROCESSES

1. DPTEG Associations will provide up to 5 names, CVs and contact details from their members to the Nautical Institute to compose the Appeal Panel list.
2. Where the Independent Appeal Panel is needed, The Nautical Institute will select 3 names from the Panel list, avoiding any obvious conflicts of interest. The Institute will check their availability to work on the appeal case and enquire whether there are any conflicts of interest before sharing any detailed information on the case.

3. Once availability and suitability is confirmed, the independent persons will be required to sign a confidentiality agreement with The Nautical Institute to ensure that no data will be shared outside of the investigation and appeal process.
4. Once the confidentiality agreement is signed, the NI will confirm the Panel composition and share the documents of the case with panellists.
5. The Panel will have 45 days from the sharing date of the documents, to assess the case and provide the final report with final decision to The Nautical Institute.
6. The Panel may meet physically or through electronic means, whichever is deemed most convenient by the members.
7. Panellists should agree on a Chairman from their number and delegate the taking of notes to a different panellist, who should also compile the final report.
8. Other administrative matters may be decided upon between the panellists.

APPENDIX I - THE NAUTICAL INSTITUTE TRAVEL EXPENSES POLICY

Within the constraints of the Institute's current financial resources, the Executive Board wishes to encourage the attendance of an international mix of training providers as part of the Institute's governance and consultation processes.

Training providers are required to attend the Regional Training Providers (RTP) meetings at least once every three years. The Nautical Institute, however, encourages training providers to attend the meetings annually and will assist them with a partial reimbursement of their flight, transport and hotel expenses. Meals are not included in the reimbursement.

Only training providers who attend the meeting can claim for reimbursement. A maximum of £600 (six hundred pounds) can be claimed upon production of receipts, subject to approval by The Nautical Institute, which will not be unreasonably withheld. The £600 is a maximum, but not an allowance, which means that training providers can only claim what they have spent.

When training providers decide to send two or more attendees to the area meeting, only one attendance can be claimed for reimbursement.

The reimbursement basis for rail travel will be the price of a standard class rail fare booked at least one week before the date of travel. Costs of travel to/from the home station may be claimed under this item.

The basis for air travel reimbursed by the Institute shall be economy class, booked at least one month in advance, with discounts if normally obtainable. Costs of travel to/from the airports may be claimed under this item. Training providers are encouraged to book travel early so as to maximise availability of low cost fares.

Hotel accommodation will normally be booked and paid for by the Institute on the basis of Bed & Breakfast at a Premier Inn or equivalent for a maximum of two nights for a one-day meeting. Any extra days or services utilised at the hotel will be for the training provider's account. If the attendee wishes to arrange his/her own accommodation, the Institute will only reimburse the costs against receipts up to the cost of the Premier Inn standard.

The policies and criteria above related to flight, hotel and transport also apply to the Regional Area representative who attends DPTEG meetings.

APPENDIX J – FAILURE MODE CHECKLIST

DP Simulator course Failure Modes checklist

Course dates:

From: _____

To: _____

Instructor: _____

No.	FAILURE MODE (Thrusters)	CORRECTIVE ACTION	COMPLETED	EXERCISE No.
1	Most useful thruster fails to 100% pitch/rpm. (Feedback indicates 100%)	Detect fault. Emergency stop Thruster. (Deselection of thruster does not stop thrust.)		
2	Most useful thruster feedback indicates 100% pitch/rpm but thruster is working normally.	Detect fault. Is heading or position changing? Emergency stop thruster if required. (Deselection of thruster does not stop thrust.) DP should continue to operate thruster, stop operation and move to safe location and check thruster.		
3	Most useful thruster fails to 0% pitch/rpm	Consider vessel capability after loss of thruster. Take action as required.		
4	Operator deselects thruster for engineering purposes (request from E/R) engineer trips another (critical) thruster.	Detect mistake. Inform engine room. Determine effect of the loss of this thruster has on vessel capability.		
5	Thruster having setpoint or feedback error. The magnitude of the error can be set to either cause a thruster alarm or be set so that the error is below alarm limits and only detectable by DPO observation of setpoint/feedback data.	Detect fault. Consider vessel capability. Have thruster checked and take corrective action as required. (Non alarm event might not be noticed by DPOs) The DPO must monitor the thruster setpoint / feedback and understand the information.		
6	Freeze a thruster (setpoint) after the vessel has settled on position and heading. (If a good model has built up there may be no alarm until weather conditions change or a move is input.)	Detect fault. (There may be no alarm if weather conditions are constant and the current model is built up.)		
7	Present a situation where thruster/thrusters down for maintenance.	Project should not progress until adequate thrusters are		

	Vessel has sufficient remaining thrusters to hold position and complete the task assigned. However, when ½ blackout occurs, there will be insufficient thrusters online to maintain position control. (Vessel does not have redundancy with thruster/thrusters down.)	available.		
8	Any of the thrusters down for maintenance.	Consider effect of thruster loss on vessel capability.		
9	Downline, umbilical, cargo hose, etc., fouls a thruster causing it to fail.	Consider vessel capability after loss of thruster. If required, alter operational status to reflect loss of thruster.		
10	ROV power failure while underneath vessel. ROV has sufficient tether out to reach surface and has positive buoyancy. Vessel may be secured to bottom by a pipe, cable or umbilical.	Shutdown thrusters or move vessel (as required) to prevent ROV contacting thrusters. Give consideration to DP operation and redundancy while doing so. (Was umbilical length considered during planning of operation? Does ROV have positive or negative buoyancy?)		
11	Thrusters in fixed azimuth mode in light weather conditions. Increase environmental loads to the point where vessel will not maintain position in fixed mode.	Thrusters should be switched to free slew as required to prevent loss of position.		
No.	FAILURE MODE (Sensors)	CORRECTIVE ACTION	COMPLETED	EXERCISE No.
12	Wind sensor shielded by platform and then sees extra wind (15 knots) after vessel move. (Wind increase can vary.)	Position vessel at a distance from platform such that excursion caused by extra wind will not cause a collision. (Be aware that wind sensor is not registering actual wind.)		
13	Wind sensor sees at extra wind (50 knots) for a short period due to helicopter arrival.	Deselect wind sensor before helicopter arrival. Reselect after departure. Note some DP systems will just reject the wind from the system, this is a problem if the wind is from a storm front.		
14	False high wind reading registering in DP system (in period when real wind is less than 5 knots) but not on anemometer direct readouts.	Ascertain real order of magnitude of wind, deselect wind sensors, and monitor any vessel movement and correction.		
15	Anemometer fouled (possibly by halyard). Gives fixed wind direction and speed error.	Determine cause of fault. Initiate action to have fault corrected.		
16	Single Anemometer Failure.	Initiate repairs. Check remaining anemometer/anemometers for quality of data to determine if operation can continue.		

17	Selected Gyro drifting slowly 3 Gyros online.	Investigate gyro error. (If all three gyros are selected, voting should eliminate faulty gyro.) Consider affect on vessel operational status.		
18	Selected Gyro drifting slowly 2 Gyros online.	Investigate gyro error. Attempt to determine which gyro is in error. (If difference becomes too large and faulty gyro cannot be determined, consideration must be given to stopping DP operation.)		
19	Single Gyro Failure	Consider effect on redundancy. Initiate repairs. Check remaining Gyro/Gyros.		
20	Fail gyros (dependant on number selected) to cause position dropout/model control.	DP Operation to be suspended until problem is corrected. Vessel move to a safe location if required.		
21	MRU/VRS/VRU selected jumps 5° static angle.	Investigate alarm. Determine effect, if any, sensor fault has on position references.		
22	Single MRU/VRS/VRU Failure.	Consider effect on redundancy. Initiate repairs. Check remaining sensors.		
No.	FAILURE MODE (Position References)	CORRECTIVE ACTION	COMPLETED	EXERCISE No.
23	A perfect (frozen) position reference updating DP with constant position. Requires a situation where only 1 reference or 2 of the same type are selected (i.e. DGPS).	(Vessel likely to drift of due to frozen reference.) Detect fault. Enable stable references, if available, and deselect faulty references.		
24	GPS signals/ DGPS correction signals blocked because of close proximity to platform.	Determine cause. Check standing orders/field procedures for minimum references. Activate standby reference, if required/available. Consider loss during operation planning. Should have been pick up during planning, change to a different correction source.		
25	DGPS correction signals blocked/ become noisy due to atmospheric/scintillations interference.	Check standing orders/field procedures for minimum references. Activate standby reference if required/available.		
26	Artemis signal lost due to object (cranes, other vessel, etc.) passing between fixed and mobile antennas. Also could be for Fanbeam/Cyscan/RADius/Radascan.	Determine cause (line of sight blocked). Check standing orders/field procedures for minimum references. Activate standby reference if required/available. Consider loss during operation planning.		

27	Fail RADius/Radascan due to battery failure in transponder.	Determine cause. Check standing orders/field procedures for minimum references. Activate standby reference if required/available. Consider loss during operation planning.		
28	Fanbean/Cyscan signal fails due to rain showers, snow or fog..	Determine cause. Check standing orders/field procedures for minimum references. Activate standby reference if required/available. Consider loss during operation planning.		
29	Fail HPR beacons due to excessive noise.	Determine cause. Check standing orders/field procedures for minimum references. Activate standby reference if required/available. Consider loss during operation planning.		
30	HPR interference due to another vessel in the area using the same beacon.	Check with other vessels in area before deploying beacons.		
31	Fail HPR beacons due to battery failure.	Determine cause. Check standing orders/field procedures for minimum references. Activate standby reference if required/available. Consider loss during operation planning.		
32	Making position moves while working in shallow water using Taut Wire and/or HPR as references.	Take shallow water into account and expect large number of replumbs and possibly noisy HPR. If possible, deploy surface references as backups.		
33	Taut Wire fouled by ROV, diver, downlines, air lines etc.	Monitor divers/ROV closely. Make all parties aware of Tautwire/HPR locations. Deploy standby reference or fix problem with fouled reference.		
34	Taut Wire failure due to mechanical problems.	Check standing orders/field procedures for minimum references. Activate standby reference if required/available.		
35	Conducting operation with using the minimum number of references required as per standing orders or field procedures. Fail one of the references.	Have standby reference available for activation/deployment. If no standby reference, consider affect on vessel operational status.		
36	Fail references (dependent on number and type selected) to cause position dropout/model control.	DP Operation to be suspended until problem is corrected. Vessel move to a safe location if required. Check standing orders/field procedures for minimum references. Activate standby reference if required/available.		
37	Increase noise on a reference to the point where it is still accepted by	Detect fault. Check standing orders/field procedures for		

	DP but weight is alternating between very low and/or 0.	minimum references. Activate standby reference if required/available. (With no weight the reference is not acceptable.)		
38	Drop-out of DGPS signals resulting in loss of Absolute reference within DARPS system, and subsequent loss of "Reaction Box" function. (Shuttle Tanker, Tandem Loading)	Monitor movement of both FPSO and Shuttle tanker to ensure relative movement does not become out of phase. Stop cargo transfer operations. Prepare to abort operation or consider taut hawser mode if FSOG permit.		
39	Failure of all relative position reference systems, with only Absolute DGPS functioning. (Shuttle Tanker, Tandem Loading)	Use all means to assess change in relative position – such as hawser catenary and/or tension. Stop cargo transfer operations. Prepare to abort operation or consider taut hawser mode if FSOG permit.		
No.	FAILURE MODE (Power)	CORRECTIVE ACTION	COMPLETED	EXERCISE No.
40	Vessel equipped with switchboard that can be divided into at least 2 sections with a bus tie breaker. ½ the switchboard (1 section) has a blackout causing the loss of the thrusters it supplies. Vessel working upwind of platform and near capability limits (with 1 Bus section offline).	This would be a worst case failure and vessel need to go to Yellow alert, safely stop operations and then move vessel to a drift off position and move outside 500m		
41	Complete blackout due to failure of bus tie breaker to work properly. (When operating with common bus.)	Monitor position while drifting. Prepare for immediate action on return of power supply.		
42	Start operation with minimum number of generators. Increase environmental loads. (Power management system fails to react to increased demand.)	Monitor power usage and request start of extra generators as required.		
43	Generator/generators fail during operation.	Consider effect of reduced power capacity on capability of vessel. Bring extra generators online (if available) to replace those lost. Move vessel to safe location if required.		
44	Generator/generators out of service either due to failure or for maintenance.	Consider effect of reduced power capacity on capability.		
45	Vessel equipped with switchboard that can be divided into at least 2 sections with a bus tie breaker. ½ the switchboard (1 section) has a blackout causing the loss of the thrusters it supplies. Without the failed	Discontinue operation until redundancy is restored. Move vessel to safe location if required.		

	switchboard, vessel doesn't have required redundancy to conduct the operation.			
46	Start exercise with common Bus and all online generators on either Bus 1 or Bus 2. (Blackout on that side will cause complete blackout)	Generators in use should be set so that power is available on both Bus.		
47	Complete blackout. Then make all thrusters available and give back only 1 generator or multiple generators that have insufficient power to meet thrust requirements.	Monitor position while drifting. Prepare for immediate action on return of power supply. Decide how best to utilize available power/thrust so as to minimize loss of heading/position and the possibility of further blackout.		
No.	FAILURE MODE (Environment)	CORRECTIVE ACTION	COMPLETED	EXERCISE No.
50	Change weather conditions and/or current such that work must be terminated or vessel position/heading changed.	Observe degrading weather closely and take action before vessel loses redundancy or ability to safely conduct operation.		
51	Change current and/or wind 180° causing a Δblow off@ situation to become a Δblow on situation. (Possibly use in conjunction with item 52)	Determine effect on vessel capability. Determine if it is still safe to conduct operation.		
52	Increase current and/or wind to a point beyond limits for redundancy.	Change vessel heading/position to reduce current load. Suspend operation if heading/position change not possible.		
53	Wind shift from ahead to the beam. (Wind speed such that redundancy limits are exceeded.)	Determine effect on vessel capability. Adjust heading or position if required.		
54	Sudden wind shifting in both speed and direction due to thunder storm activity. (10 knots on bow to 50 knots on beam in 45 seconds.)	Determine effect on vessel capability. Adjust heading or position if required.		
No.	FAILURE MODE (Miscellaneous)	CORRECTIVE ACTION	COMPLETED	EXERCISE No.
55	Vessel is conducting subsea operations (Diving, Pipe lay, ROV, etc.) on the lee side of a platform. There is then a serious gas leak at the platform. Also applicable to DP Shuttle Tanker when connected to an FPSO during tandem loading operations.	Consider the effect of the leak on the vessel and the dangers it presents. Take action to immediately suspend operations and prepare to move the vessel to a safe location.		
56	Unknown external force causes position excursion (vessel alongside comes in contact, thruster wash, load on crane becomes fouled, crane lift was not vertical, tension on cargo hose winching line, etc.)	Determine cause of excursion and take action to remove force. Consider possibility of excursion during planning.		

OFFSHORE SCHEME

MANDATORY: It is compulsory for training centres to apply at least one item from each section (Thrusters, Sensors, Position Reference, Power, Environment and Miscellaneous) during the Simulator course and its exercises. Other failures are subject to the training centre's choice, either to apply them through the exercises or discuss them during the debriefing. In the case of debriefing, a note should be made in the failure mode table to specify that.

Items recommended:

Item 1, 2, 3, 5 and 6

Item 20

Item 25

Item 40, 41, 43 and 47

Item 50

SHUTTLE TANKER: All items below are **MANDATORY** during course C of the Shuttle Tanker scheme.

Item 1, 3, 4

Item 14 and Item 20

Item 23, 25, 26, 35, 36, 38 and 39

Item 42 and 45

Item 52 and 54

Item 55