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**TRAINING AND COMPETENCY ASSURANCE**

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DP Training and Competence Evaluation

By Sameer Singh

Independent

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## Abstract

With many different types of vessels with varying levels of complexity, it is extremely important that the personnel manning the vessels and operating them are also competent in the positions. Even though the DP systems are becoming more reliable and complex at the same time, the trend of incidents/accidents has still not shown a downward trend yet. Root cause of most incidents/accidents is human error, incompetency or inadequate procedures. Failure to comprehend situation or evaluate machinery/systems is often classed as equipment failure, whereas there is a good possibility that with the right competent personnel in charge, it was preventable.

Companies are losing money as often there are delays/downtime, and there is also an increased level of scrutiny by Clients and defending actions to safeguard interests. Companies are leaving themselves exposed to legal action in case of any incident/accident for failure to implement proper training schemes and evaluation of competence levels of DPOs onboard.

With the number of poorly trained DPOs having increased manifold in the recent years, it's slowly becoming a problem for the entire industry. A field day for the lawyers, were they to get involved, it is entirely possible to overturn this rut.

With the war on talent set to intensify further in the coming years, it's only appropriate that the industry gets together, and addresses the issue soonest.

A few steps would be required to begin with, starting from the recruitment phase itself. The selection criteria will have to be more stringent as to who qualifies for the training. Once the candidates are selected, they will have to undergo much more thorough training, than that is presently being done, before granting of the DPO Certificate.

As presented in a subsea vessel conference in 2012, both the Nautical Institute and DNV schemes have structural flaws in them. Both schemes are not able to produce the DPOs with the levels of competence required for the safe and efficient operations of the present day complex vessels. However by having the best of both schemes, it is entirely possible to have much better trained DPOs for the future.

Two important things stand out – DP knowledge and its implementation.

Starting from the selection process itself, wherein a great amount of shift is required in the recruitment process, to ensure the personnel with the correct aptitude and attitude are taken in and precious resources of time and bunk space are utilized to the maximum.

A lot of companies give emphasis to the training, but is the training that is being actually imparted, in line with the thought process and industry best practices. How can the evaluation be done impartially, and are there ways and methods to improve the existing processes. Can the industry get together and just as standards are laid down for the hardware, can standards for evaluation of competence be laid down.

## Introduction

With more and more vessels of varying complexity being built, over the years, the requirements for the personnel operating them has been changing as well. However the grouse of the industry is that they are unable to find sufficient number of competent personnel. With the vast number of marine personnel available worldwide, it appears quite an alarming situation that the vessel owners are still not being able to find and train the personnel to the required levels wherein their interests can be safeguarded against possible lawsuits over incidents/accidents arising out of incompetence of the personnel. Merely creating paperwork inducing competency schemes is not going to be enough to arrest this decline in the competence standards.

The DP systems are becoming more reliable as time goes by, with more robust hardware as well as software. Yet, the trend of incidents is not decreasing, and seemingly trivial issues, which not having been nipped in the bud, being the root causes. Often the failure of the personnel to comprehend the situation or evaluate the machinery/systems properly is being classed as equipment failure after an incident has occurred. Companies are losing more money often due to delays/downtime. At the same time companies are facing increasing scrutiny from clients, especially some pro-active ones who have competent and experienced representatives safeguarding their interests. A lot of the companies are leaving themselves exposed to legal action from differing quarters for failure to properly implement training schemes and evaluation of the competence levels of DPOs on board.

The situation at present is such that it is not uncommon to meet fully certified and experienced DPOs, who are not even capable to explaining how a DP system works, or how reference system outputs are corrected by inputs from VRU/MRU. It is downright comical at times to hear the answers one sees or gets, and extremely saddening to see the massive decline in the standards of the personnel who are holding full DP certificates.

Companies are constantly advertising for personnel without even bothering about specifying what the requirements of the job are. And a lot of the personnel are only interested in logging sea time to show experience without actually gaining the requisite competence in the time.

There are not enough competent and experienced people for the existing vessels, never mind the newer vessels that are coming out of the yards. The age gap is getting greater at the top end, and all the organisations are fighting for the same people. The problem thus becomes two fold, not just recruiting the right personnel, but also retaining them. Merely having greater number of certified personnel is not going to solve the problem; it's only going to aggravate it for the future, as quality and competence needs to be addressed side by side.

There are many companies trying to improve the competence levels of the DPOs, but are not necessarily achieving the desired results. Companies have different benchmarks, and standardised evaluation against different benchmarks is not possible.

## Knowledge as Foundation of all Skills

Skills developed without adequate knowledge can only work when the going is good. If scenario changes and the person is unable to comprehend the situation correctly owing to lack of knowledge, then outcome could be disastrous.

“A study by the U.S. Coast Guard found many areas where the industry can improve safety and performance ... the three largest problems were fatigue, inadequate communication ... and inadequate technical knowledge.” - Human Error and Marine Safety - U.S. Coast Guard Research & Development Centre

“Knowledge-based mistakes may occur when we have to think our way through a novel situation for which we do not have a procedure or rule” Searching for the Root Causes of Maritime Casualties - Maritime Research Centre, Warsash, Southampton, UK

We can even teach a monkey how to perform a skill under conditions which never change. However, as soon as conditions vary slightly, it's a human with knowledge and the ability to reason, who can make intelligent decisions and continue to perform the skill correctly and safely. The deeper the knowledge, the more readily adaptable the person is to the more widely fluctuating conditions. In light of the ever-increasing complexity of vessel-based systems and the correspondingly complex knowledge required of modern mariners, understanding “how” to perform some task without understanding at least a little about the systems which underlie the task being performed creates a safety risk. First, an understanding of the underlying systems will help inform the person as to the consequences that arise when the task is not performed or is incorrectly performed. Having this knowledge creates a critical incentive to conscientious (and therefore safe) performance. Similarly, having an understanding of the underlying systems will help the person make intelligent decisions when presented with unexpected equipment operation, unexpected readings, or a novel emergency situation. And this is not just true for DPOs, but for a person in any industry.

“Personnel on the \*\*\*\*\* were mostly trained on the job, and this training was supplemented with limited short courses .... While this appears to be consistent with industry standard practice ... it is not consistent with other safety-critical industries. “The failures and missed indications of hazard were not isolated events ... [these] raise questions about the adequacy of operating knowledge on the part of key personnel.”

This statement is from the report of an accident investigation wherein several lives were lost and vessel sunk, even though that the owners had a large scale comprehensive training program for personnel and plenty of on-job training modules as well. It stems from the inability of the company to select the personnel with the right aptitude and attitude for the work they were doing and imparting skills training without in-depth knowledge of the underlying principles, creating a false sense of security of trained and competent personnel. Even though the personnel onboard were training on a regular basis, the outcome of that training was not as desired, and instead of having properly trained personnel the company ended up with a loss owing to personnel who only seemed to have the required training on paper but with no real in-depth knowledge to handle the situation.

## Selection of Trainee DPOs

The declining competence starts from the selection process itself. There is a virtually no minimum criteria set for who can enter the training schemes, apart from the basic certificate of competence, that too which has come about after many years of discussions. There is very little evaluation of the personnel entering the training scheme, for his/her ability to assimilate information and take correct decisions based on that when faced with information overload in an escalating critical situation. Either the personnel pay for doing the courses themselves, in the hope of being more marketable to companies that are hiring (and which don't want to pay for that) or go through selection process for training berths with some of the conscientious companies. However there the initial shortlisting is more often than not done by staff that has never worked in similar positions and do not have an in-depth knowledge about the working and requirements, and instead just follow a robotic checklist for the perceived required criteria. Often only looking at the keywords in a CV may indicate huge gap in the skills and knowledge which the candidate claims and what is actually there. Nautical/marine skills are often not properly evaluated for the same reason, and they are certainly not able to fathom the probable capabilities of the candidates in differing situations. Very rarely do the candidates have to undergo psychological/psychometric evaluation or evaluation of potential behaviour under stress, which could have a huge impact on the outcome of a critical situation that one might face down the years. Having come across bi-polar personnel working as DPOs, its scary evaluating the possibilities that might arise if such a person is on the desk and faced with a critical situation. Needless to say, the grim situation is compounded by the fact that there are numerous unscrupulous elements who indulge in nepotism and corruption in the selection, which results in more competent personnel being unable to secure the vital training berths.

To improve the competence levels of the DPOs, the process has to start by improving on the quality of selection of the personnel for the training itself. This should ideally be a two stage process, one being for an assessment of existing knowledge/skills and other being psychometric/psychological evaluation to determine probable suitability in the role of a DPO. The questions must be varied such that no candidates are not able to gain unfair advantage, by indulging in unfair/corrupt practices and obtaining the question sets beforehand. Experienced Master's/SDPOs should be utilised for shortlisting CVs for potential candidates, with a clear mandate of doing at an arm's length from known person. Only then should the HR personnel go in for personal interviews to determine the suitability of the potential candidates. People are the most important assets of a company, and retaining them after training is the fear amongst a lot of companies. The interests of the companies should not be neglected if they are utilising precious resources in the training. Setting up of biometric registration of all DPOs and trainees by a central organisation can help overcome this. Proper recording of DP time and training on the basis of this registration can be achieved. By introducing company specific DP certificates with time frame for conversion to non- company specific, which cannot not be accepted by clients on any other company's vessels, and which are verifiable using this biometric registration, fear of losing trained personnel before they have completed the time required to be served at the companies providing the resources for the training, can be virtually eliminated. Only the owners/operators of the vessels should be allowed to forward the training records, so as to minimise fraudulent entries.

## Training of DPOs

IMO standardised training through STCW long ago, yet there are glaring differences in the competence levels of personnel from different countries, which are signatories to the convention. By specifying minimum standards, the aspiration seems to be to get personnel with the minimum standards to be accepted, and not strive for improving the standards.

At present there are two DP Training schemes, by NI and DNV, and a third one, by OVDA in the making. The NI scheme has been around for decades and recently undergoing changes. A case of too little too late. The warning bells had been ringing years ago, at the turn of the century, but they went unheeded till it was too late. Although substantial efforts have been made by the NI in the direction of improving the quality of the DPOs, they appear to have once again succumbed to the pressures of churning out certificated personnel, without thorough understanding of what is the need of the hour to improve the quality of the DPOs undergoing training today, so that they are able to match the standards of what it had once been less than 2 decades ago. The biggest problem that the NI scheme faced and still faces is that it is a gentleman's scheme so to say; it relies on the sincerity and integrity of the individuals undergoing the training and the trainers as well. And this is wherein lies the problem, on both the sides. There is not only rampant fraud; the issue of credibility of the people signing the logbooks is also questionable. A lot of the personnel, who became DPOs by unscrupulous means without the appropriate training and knowledge, have been signing the logbooks of others - the blind leading the blind!! No wonder that the competence levels spiralled down. The NI scheme relied on the Master, signing the logbook stating the competency of the trainee, to be well versed and thoroughly competent about DP with no other checks in place. This is the Achilles heel of the scheme. There was no minimum competence level required to start the training, no standardised evaluation at the end of the courses or even for the certification, no checks on the actual amount of time spent on DP, or on stationary vessels. There was and still is no proper defined evaluation of the ability of the DPOs to take over the vessel and hold it in manual mode should the DP fail. Impartial neutral standard evaluation of the knowledge and ability of the trainees is not there even at present.

Enter the DNV scheme of training, which relies majorly on simulator based training. A few questions asked remained unanswered. Whilst at a glance the scheme appears to iron out the flaws in the NI scheme, the reliance on model software outcomes, the lack of real experience and thorough testing of the trainees is the drawback of this scheme. Proponents of simulators will argue that simulators are the best way to train personnel which wouldn't have been possible otherwise. However most people who replied back to the questions posted on various forums, were unanimous in stating that simulators are a far cry from the learning experience gained onboard. Though it does instil some confidence in the trainees, the handling in real is lot more challenging and often different, as not only is it different from the model reactions which one gets on the simulators that could throw one off completely, but also the pressure of knowing that there is no second chance in real which causes the people to react differently.

Not so long ago there was a thesis written about a comparison of the two schemes by a gentleman who was a trainee DPO still completing college. A person who does not even have enough knowledge or experience to hold an independent watch as a mariner, and yet slams the scheme wherein he was not able to gain the certificate quickly, and in favour of a scheme with virtually no hands on experience wherein he could gain a certificate in no time, and go onboard as a DPO. There is time tested reasoning behind adequate hands on experience that is required in the NI scheme, which a lot of the people are unable to comprehend, mainly due to their inability to have got into the proper scheme of training and experiencing the benefits. The reason I mention proper scheme of training is because in a lot of places, even though the NI scheme is in place, the execution is a far cry from its original intention. Both the NI and DNV schemes have good points, and these should be combined to give a much stronger and robust system of training of more competent DPOs for the future, and gradually incorporate that for existing DPOs as well. This may not be readily acceptable to the trainees and existing DPOs (who may resent being tested for their competence if they are not sure about their ability to prove their competence above the minimum requirement).

IMCA M002 & 117 and IMCA C007 provide a lot of guidance for the training, but more often than not it's not heeded. Amongst the salient points being routinely flouted is the need for the assessors to be competent to carry out the assessments of the personnel being assessed. The assessor should be a supervisor or manager with the necessary knowledge and experience to be able to judge competence being assessed, and should also have been provided with suitable training on assessment. Several DP Training Centres are employing Instructors without competence level as per IMCA mandate and only the key instructor has the needed competence levels. In the NI scheme there is no such requirement for the assessors who are signing off the logbooks and who play a vital role in the training as well. Though ship handling skills/experience is required for DPO competence, person with no formal ship handling experience or training or knowledge are allowed to gain certification, with little thought as to the catastrophic outcome that might be there should the DP fail in a critical situation. Whilst there are a lot of proponents of non-marine qualified personnel becoming DPOs, how can personnel who have not had formal education and evaluation in various aspects of navigation, ship handling, stability etc. have a good understanding of the DP, and especially actions to take in case of emergency. A 5 day course is not enough to imbibe the years of knowledge and experience in a person who may have to take decisions in an emergency which would decide a successful outcome or not. One cannot rely on the other DPO/SDPO to be the experienced one who will be able to handle the situation correctly, as there is a strong possibility that it could be the same case there too.

As per IMCA Competence level - Job Code A01-04, the various job functions cannot be performed competently by personnel who are not holding II/1 or II/2 or II/3 certificates. As per IMCA Job Category A04 Note, Senior DP Operator shall always be a qualified Navigational Watchkeeper, which is at odds with the current training scheme requirements. Could a possibility arise then that a DPO is far more competent than a SDPO who is merely there on account of holding a certificate of competency as a navigational watchkeeper. There are numerous companies which operate on the borderlines of the requirements, and it is not hard to find experienced DPOs from such outfits going to other vessels on the basis of the "long experience they have", and proving to be grossly incompetent and a liability for the others onboard, who are forced to put up with them due to either commercial or HR pressures.

Prospective DPOs naturally prefer the simulator course over actual sea time, due to the limited availability of the training berths, and the extra time that it would take to gain the needed experience and competence. Has the DP training community seriously sat down to give it a conscientious thought about the effects that this would have on the competence levels of the DPOs. The reason why simulator courses have been given so much thrust is primarily from the demands of the industry to churn out larger number of certificated DPOs in a shorter time frame without due consideration to the training quality. Any senior person with strong in-depth knowledge and competence will affirm that it takes a very long time, sometimes years, after completing the seetime requirements and gaining the DP certificate for a DPO to be really able to handle the bridge effectively. The feel and confidence that one gain when working on a live vessel cannot be matched with a virtual one, where one knows that behind the wall are the trainers who are performing all the roles and there is only a limited amount of scenarios that can be simulated. Operating a simulator is far different from handling a real vessel. On a simulator one cannot replicate the feeling that one would get when involved in a close quarters situation in real. Somebody wrote somewhere very rightly - Soldiers are made in the battlefield, not on the simulator. No matter how much driving you practise on a simulator, there is no substitute for actual learning on the road with real vehicles around which are not going to be doing what one expects all the time, and with so many other drivers around, cannot be replicated in a simulator wherein you have a handful of trainers controlling the scenarios.

One has to look at how thoroughly airline pilots are trained. Despite hundreds of hours of simulator training, they still have to do actual flying. They have Check Pilots, Instructors and Examiners evaluating them. Empty aircraft are flown by the trainee pilots to ensure that they are familiarised without endangering lives. Regular refresher simulator training is carried out, and regular checks as frequently as 2 months. An Examiner can go to the pilot of any aircraft operating in that country and ask to demonstrate competency

levels. The reason why this analogy is being given is because the larger construction/accommodation/drilling vessels may have upwards of 200 people onboard and wrong actions by the DPO can potentially endanger all the lives onboard.

Right aptitude and attitude is required for the personnel for training, both for the trainers and the trainees as well. There must be a detailed structured programme onboard for training, with very specific benchmarks. Just signing off saying that the person is competent in ship handling is not enough, it must specify various aspects, such as demonstrate moving vessel from one position to another with deviation no more than 5 degrees or 100m, or hold vessel on manual levers within 10m of set point for 10min.

Knowledge and Skill based trainings are both equally important, and must complement each other. Without the other, each one is hollow on its own. The onboard trainers must receive training for being trainers as well. The trainees need to be trained not spoon-fed, and for this knowledge must precede the skills to be developed. Often it is seen that in a lot of places the trainees/examinees do selective preparation in the hope that since 100% passing mark is not required, they will have a good chance to pass with limited knowledge only. To prevent this from happening in the training and development of DPOs, the training must cover all topics, not just prepare for testing on certain topics. A more detailed and comprehensive standardised list of tasks to accomplish and knowledge to be gained must be incorporated in the training section of logbooks. CBT is a nice tool if used effectively, and again relies on the integrity of the person undertaking it. Unfortunately, if not properly implemented, it has been rampantly misused to gain the “certification” without gaining the knowledge required to do so.

Knowledge training has to be the first step. Skills training to be commenced once the trainee completes the knowledge training and intermediate assessment for that aspect. For this ideally a combination of training methods under NI and DNV schemes should be incorporated. Practical exposure is a must as no simulator can prepare for the plethora of activities that take place onboard and the lessons that the trainee learns whilst on the job. DP Drills must be made mandatory for various scenarios, and verified to be actually carried out at regular intervals, and not just paper exercises. It might take only 20-30min in a month during location change or rig moves to simulate some problem which will require the intervention of the DPOs and allow valuable lessons to be learnt, be it the familiarity with the equipment or the handling of the vessel.

### Recording DP training and watch keeping time

A big problem is there in recording the time spent on DP for training purposes. Whilst a lot of changes have been made, it has come to the point where it is difficult for a Master to revalidate his certificate for want of DP time. Unfortunately a lot of logbooks are going to be flogged for this. It's better to keep it simple and robust, rather than complicated if then scenarios. Revision of the logbook should indicate days as well as

hours on DP watch. If the DP time onboard a vessel is to be counted the vessel must be registered as a DP vessel with the organisation. Numbered logbooks with biometric IDs for the candidates should be used, which can be used for tracking the amount of actual time spent on DP. Daily reporting from each DP vessel of number of hours on DP, type of work performed, DP times of DPOs (incl Trainees) in a standard format will make it easier to keep a tally and prevent fraudulent watchkeeping hours for all, since the records will have to be matched to the daily reports sent in to the company/clients. Reporting to the organisation must only be done by the company on a weekly/fortnightly/monthly basis using available IT resources to develop such a common platform. The cost will be minimal as compared to the delays faced and waste of human resources needed to check this by the method that is used today. With the large number of personnel gaining certification/time through fraudulent means, this will serve a quick check and once detected, it must lead to cancellation of licenses, and barring for 5 years as a minimum to serve as a deterrent for other personnel trying the same. This will also help companies establish quickly across the industry an independent means of verifying the experience of the prospective personnel for operating their vessels.

## Competence Evaluation

Assessors must be competent for the task of assessment of the skills and knowledge, and should have formal training for the same. They must be held accountable for their assessment deeming the assessee competent in a particular task. Merely putting a signature in a box should not be encouraged, instead it must hold some

weightage, and if proven later that the DPO is not conversant in the tasks signed up in the logbook, then the assessor who has signed up to vouch for the competency must be held accountable.

For the training to be effective, even the trainers should not know the exact assessment that will be done so that they don't train only for the test. Reflection should be there as to who the trainers were for the trainee, so that the quality of the training can also be ascertained and the onus of improper training not rest on the trainee alone.

Just as independent Legislature, Executive and Judiciary are the pillars of good governance, the trainers and assessors should be separate, and the assessor must not be known to the trainee being assessed.

Third party assessors must be called in if required to independently assess it's not possible to maintain the segregation. This stems from the reason that a lot of training institutes are only in the business of making money, and not actually imparting the necessary training to the candidates, and some of them are pliable for favourable results to ensure continued business. By separating the assessors and the trainers, this loophole can be shutdown effectively. We have had a phenomenal amount of work being done by a lot of organisations and lots of standards being developed over the years, but has it really trickled down and achieved the desired results.

Whilst a lot of work that has been done by various organisations for improving the safety of the industry, it has not even been read by a large number of personnel in the industry, much less it being appreciated, some of the standards laid down are very basic and downrightly promoting mediocrity. Guidance notes developed by an organisation for the required competence levels for a Master, a person in charge of the operations and critical factor in determining a successful outcome for emergencies onboard, only requires to a "Knowledgeable" (a very subjective term) for most aspects, and "Aware" for a some aspects and "Skilled" for a few aspects. Such low standards for person in charge can only lead to a downward spiral for the competence levels as juniors having acquired just those levels will strive for the top slot and never be in a position to fully appreciate the totality of the potential outcomes. Whilst the Legislature part has lost touch and often out of date, the mingling of the Executive with the Judiciary has resulted in a massive degradation of the quality of DPOs

There should be a comprehensive assessment which is valid and reliable, and would produce consistent result if undertaken again at the same time. It should be such that it produces unbiased results over a large segment of assessee. Assessment should be broken up into sections wherein there is a Written Examination, Oral Examination and Demonstrative Examination, and be Vessel as well as Activity Specific. This may lead to certification which is limited to certain types of vessels, such as the DNV scheme, and may be resented by a lot of personnel. However drawing analogy from the airline industry once again, you do have "Type Rating" there too. The pilot may have a CAA License, but still has to have certain training for the particular type of aircraft. The different types of work performed on different vessels will result in DPOs with vastly differing knowledge and skills. A DPO who has only seen supply vessels cannot be expected to be as competent on a dive support vessel or pipe layer. A DPO from a drillship will find the working on a pipe layer of a similar size very different and take time to learn the various aspects of the job there.

There must be written guides for the assessment for both objective and subjective parts to standardise the system and prevent biased questioning. The assessment base should be large, so as to prevent wildly fluctuating results that may be there on a small question base. 360 degree assessment used in various industries and companies should be adopted here as well.

Regular continuous assessments for all should be a must to keep certification valid. This has already been introduced to a certain extent by the NI, but as much as a lot of people will resent, not just be limited to

simply sea time experience over a few years but also include assessment.

There should be regular competency checks for positions held onboard by independent assessors, so as to remove any possibility of bias and also help the company get a true picture of the requirements for training of the DPOs. The companies should also encourage regular simulator training for management of emergencies, and incorporate this in their competence assurance programmes.

With the huge amount of resources, which are at stake for the various companies, both as operators of the vessels and as the contractors for the services, it would seem logical to propose a common platform for the assessment of the DPOs. Instead of the fragmented training and assessment that is happening today, there is a need to have a standardisation so that the personnel can be evaluated on a worldwide basis to the same standards. This would be immensely beneficial to all those involved in the utilisation of DP vessels and the insurance industry as well, as it would provide consistent results. This can be achieved by the creation of an Independent Assessment Centre, which will provide standardised assessment worldwide. By having written, oral and practical assessments, certification/assessment from this centre would grade the competency levels of the DPOs and provide the various companies a better option for standardised evaluation of the DPOs and further training requirements. Class A Simulator based on IMCA C 014 should be utilised for the same. As the name suggests this assessment centre must be independent of all training centres, and would only strive to provide a grading of the DPOs and remove the favourable bias that might be there if the training and assessment is done from the same place wherein there might be commercial pressures to ensure that all trainees pass. Expanding further, it could be used for assessment of DPOs for revalidation/regrading to enable independent verification of competence levels as part of the competence assurance system. With continuous updates for new technology and procedures, it would also ensure that the DPOs keep abreast of the developments in the industry.

All personnel could be evaluated at set intervals, and neutrally. Some companies and personnel contacted were however not too conducive to this idea, even if no extra costs were involved, as it is perceived that then they will no longer be able to show that their personnel are competent as claimed.

## Conclusion

IMO has standardised STCW long ago, but there still is a glaring difference in the competence levels of seafarers from various countries which are signatory to the convention. Taking cognisance of this fact, the industry needs to get together for chalking out long term evolution in the standardisation of training and competence evaluation processes, instead of fragmenting the training standards further, even though this might be at the cost of some short term pains in terms of training the personnel to the required levels. This

will not only be beneficial for the personnel who will be joining in the future, but also for the existing personnel who will be able to enhance their competence levels and simultaneously result in lower operating expenses as a direct consequence of lesser incidents/accidents and lesser downtime. A direct positive outcome of this will also be the reduced litigation expenses which could be faced by the owners/operators/companies should there be an incident/accident.

Just as the relentless work of various personnel and organisations around the world has resulted in standardised rules and regulations for the hardware found on the ships/MODUs, similarly standards for the training of DPOs and competence evaluation must be harmonised. Instead of further fragmentation of the training standards, the organisations should come together to harmonise the training and competency evaluations, such that it addresses the needs of the various segments of the industry, and removes the shortcomings being faced at present. With the future requirement of personnel to be even more competent to handle the even more complex and sophisticated vessels that will come out from the yards in the future, there will be greater stakes at risk should the competency levels of the operators not be up to the mark to handle the more complex problems that could be faced. If the present trend continues, the question that all need to ask is that from where will the future staff with matching competent levels come from??

## Acknowledgements & References

Nautical Institute

USCG

Marine Accident Investigation Board

Martime Research Centre

IDPOA

Det Norske Veritas

Online marine websites/publications

Various Forums on Facebook and LinkedIn