Proceedings of the ASME/USCG 2013
3rd Workshop on Marine Technology and Standards
MTS2013
July 24-25, 2013, Arlington, VA, USA

MTS2013-0309

MUTUALLY RESPONSIBLE COMPETENCY

Dynamic Positioning Proficiency Development

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ABSTRACT

DP operators are trained to be reactionary – to know what to do, how to do it, and when to do it – but understanding why certain actions are performed and the potential consequences is lacking. Further, the policies and procedures enacted at the management and regulatory levels fail to address many potential risks, further endangering personnel, the environment, assets, and operations. It is therefore an industry responsibility to monitor and develop the competencies of not only DP operational personnel, but also of shore side management at all levels, and to ensure the applicability of policies and procedures that affect DP operations.

INTRODUCTION

Competent personnel are today, and always have been, key to safe and successful DP operations. However, the issues of DP personnel competency assurance and assessment are becoming increasingly critical as the offshore sector witnesses unprecedented growth in demand for qualified personnel against a diminishing pool of resources.

The majority of DP operational personnel have been trained to know what to do, how to do it, and when to do it. It is evident however, that many do not know why certain actions are performed or what the potential consequences of those actions may be. Furthermore, the nature of the policies, procedures, and requirements enacted by many operators, charterers, and regulatory authorities increases potential risk by placing DP operational personnel into unfavorable and altogether avoidable situations. As a result, when emergencies arise, many operating personnel are caught by surprise and do not know how to react.

The onus falls on the entire industry – from Class and regulatory authorities, to training providers, to charterers, to vessel owners/operators, as well as individuals – to continuously improve basic and core competency levels within existing resources. Perhaps more importantly, it is an industry responsibility to monitor and develop the competencies of not only DP operational personnel, but also of support staff, shore side management, and regulatory agencies, as well as ensure the applicability and judiciousness of policies and procedures that affect DP operations.

The DP Proficiency Development Program provides a positive and proactive approach to competency development in lieu of assessment. Unique in the industry for its modular approach and completely customizable, the Proficiency Development Program foregoes punitive audits and potentially disaffecting personnel assessments. Instead, the program concentrates on the continuous development of personnel competence as a means of assessment. The purpose of this approach is not only to provide evidence of personnel competence, but also to offer firsthand, practical experience for operating personnel and the full scope of support staff and management. Further, it actively demonstrates a company's dedication to developing its single most important resource – people.

The two years since the Deepwater Horizon tragedy have witnessed the offshore industry coming under increased scrutiny both internally and externally for its safety and assurance practices. The subsequent push to improve the industry has resulted in a paradigm shift from the typical results-driven approach, relying on near-misses outweighing actual incidents, to a more proactive philosophy. Using past mistakes as lessons learned, the post-Macondo offshore industry is the subject of a continuously evolving approach to more efficient, reliable, safer, and ultimately more profitable operations.

Nowhere is this more apparent than in the concentrated focus on seafarer's qualifications and manning requirements. Class societies, regulatory agencies, and oil majors are increasingly looking to industry groups such as IMCA, MTS, and NI to provide the benchmark for training and competency standards. These groups provide

guidelines that generally exceed most company operating requirements and applicable current flag state and Class regulations.

The industry as a whole is waiting to determine what the increasing standards foreshadow for future requirements. As happens many times throughout the industry what is perceived through experience as “best industry practice” first becomes guidance and evolves into regulation. Class societies and regulatory agencies such as the US Coast Guard are becoming increasingly aware of gaps in existing regulations and are looking to industry bodies to provide guidance. Potential clients and charterers – progressively more concerned with safe and efficient operations – many times consider the higher standards set forth in industry recommended practices and guidelines to be the new minimum operating requirements.

SUPPLY AND DEMAND

The issues surrounding manning and qualification have resulted in a crisis of numbers within the DP sector. Recommended practices and industry requirements call for qualifications and manning levels that exceed the availability of adequately trained and certified personnel. Vessel owner/operators tasked with meeting client and industry demands are under pressure to increase manning levels with qualified and competent operators from a diminishing supply. At the same time, progressive new build programs, while signifying a potentially positive shift in economic tide, will require drawing further from the same limited pool of resources.

DP operational personnel, in the meantime, are faced with seemingly ever more stringent and shifting standards that increase training and qualification requirements in an industry that provides little opportunity to receive either. The path to certification is becoming progressively more complex. Basic Certified DPOs are finding it difficult to gain even the 30 days DP time required to take the Advanced Course and upgrade their certificates. Discussion groups such as those on LinkedIn, gCaptain, and others are rife with personnel volunteering to work for free just to gain 30 days of basic DP time.

Companies pushed to maintain a higher level of manning are unwilling to hire Limited DPOs who in effect become additional onboard personnel – in excess of required safe manning levels, and at additional cost – until their training period is complete and their certification is upgraded. This represents a lengthy investment period on the part of the employer. What is more, as soon as viable candidates become available within the ranks, they become viable candidates to the industry at large. A great demand for qualified personnel from a diminishing supply has resulted substantial day rates for Unlimited DPOs. Personnel are desperate to gain necessary time to advance their careers by accessing greater opportunities while others are simply trying to gain sustainable employment in the industry.

Much of the DP industry presumes that existing DP training and certification regimes provide adequately trained and competent DPOs. Existing training and certification is targeted primarily at developing DP operating skills. It is not designed to teach DPOs how to handle the types of failure modes, fault conditions, and field situations that typically cause DP incidents, nor does Nautical Institute certification provide knowledge of the trainee's aptitude for these skills. Currently, training to handle the failure modes and fault conditions that typically cause DP incidents is accumulated by experience only.

An upgrade in training methods is required to meet the DPO shortage more quickly. Many forward looking companies are taking the next step by creating and enhancing training programs for the DPOs fast enough to meet current and future needs. The current shortage of personnel poses the risk that DPOs will be moved into positions of responsibility before they are adequately trained to handle every situation.

The industry’s experience with serious dynamic positioning incidents has been minimal. Current incident reporting methods are not completely accurate or reliable, whether by omitting details to protect company interests, or by the lack of reporting altogether by companies for the same reason. Consequently, many potential risks are ignored, considered to be improbable and not worth considering as learning or training opportunities. While DP incidents resulting in loss of life are relatively infrequent, the much more commonplace occurrence of twisted bulwarks and innocently labeled “paint transfers” should serve as reminders that much more costly incidents are possible.

At the same time, whether a result of desperation throughout the DPO community for better opportunities, an ignorance of industry requirements, or through simple dishonesty, the last few years have witnessed a flood of mostly anecdotal reports describing what some believe is nothing short of an epidemic of falsified DP time. It is

these perceived gaps in experience and competence assurance serve as the underpinning reasoning behind the need for DP personnel assessments and competency assurance.

"IF ONLY THE DPO WAS MORE COMPETENT…"

This year saw the centennial anniversary of the sinking of the passenger vessel Titanic. In the April 2012 issue of Maintenance Technology, Contributing Editor Bob Williamson details extenuating circumstances that may have contributed to the tragedy. Repeating the phrase "If it weren't for the iceberg…," Williamson points out that there were several factors that exacerbated the situation on board the ship from the iceberg warnings that had been ignored in favor of outgoing passenger messages, to missing binoculars in the crow's nest. His point being that while an iceberg physically sank Titanic there were human and procedural factors that contributed to the catastrophe. Many safety barriers that may very well have prevented the disaster were defeated well before any physical damage occurred.

Similar circumstances surround many dynamic positioning incidents the responsibility for which is many times laid at the feet of DPOs or other DP critical personnel. An example of this occurred in late 2011 when a DP OSV experienced, in effect, its Worst Case Failure following the loss of a generator and switchboard. The vessel was maintaining position using the remaining thrusters as the environment was well within the vessel's calculated position keeping capability. After the standby generator came on line and restored power, the DPO was able to restore all thrusters with the exception of a single azimuth thruster. Failing to execute a routine step necessary to restore the thruster, the DPO instead took full manual control of the vessel's propulsion, which resulted in a loss of position.

The charterer, in cooperation with the vessel operator, conducted a full investigation and DP Operator competency assessment, viewing the incident as a relatively straightforward example of DPO incompetence. In other words, if only the DPO was more competent, this incident would not have occurred. There is little question that personnel training, experience, and composure were factors that needed to be addressed in this situation. However, a number of contributing factors outside of the DPO's control were highlighted during the course of the subsequent investigation that warrants further consideration.

Engine Room standard operating procedures called for the engineering staff to alternate generators regularly in an effort to maintain even running hours between engines. As this procedure was assumed to be general knowledge, the engineers neglected to call and notify the Bridge. In this instance, a healthy generator was taken offline and the oncoming generator experienced a serious fault that resulted in the loss of power. Widely accepted recommended practice (namely, IMCA and MTS) specifies that no maintenance be conducted on items of DP critical equipment during DP operations. Further, any imminent or potential change in operating status of DP critical equipment should be communicated to all concerned parties.

All of the engineering watch standers and DPOs stood watches that ran from noon to midnight. There were no overlapping watches providing continuity of personnel. All four personnel coming on watch had been awake for only a short period prior to taking over watch standing responsibilities. The DPOs were both performing routine checklists, with neither seated at the DP desk at the time of the incident. IMCA and MTS recommend that watch schedules are laid out such that there is never a complete turnover of personnel at any given time during DP operations and that at least one DPO is dedicated to the DP desk at all times.

The Master was unable to intervene in the situation. From the time the first phone call was made to the Captain's cabin to the time the Master physically arrived on the Bridge several minutes had passed. It was not until a runner was sent that the Master was made aware of the situation, well after events had run their course. The phone system had been reported as being unreliable for some time prior to the incident and this status reported to company management but no significant corrective action had been taken.

Vessel, company and client policies and procedures should have prevented this incident from occurring but the procedural safety barriers were defeated by an atmosphere of complacency that extended beyond the vessel to levels of management within the operator, as well as the charterer and client. However, if only the DPO was more competent…

This incident demonstrates that the issue of competency is not just one involving DPOs but also DP engineers, support staff, shore side management, charterers, and perhaps beyond. The industry is quick to assess and critique the competence of a DPO when an incident occurs, but rarely takes a serious, critical look at the experience and

knowledge of those charged with developing and implementing company policies and procedures to which that DPO is bound, and even more rarely those charged with developing and enforcing industry regulation.

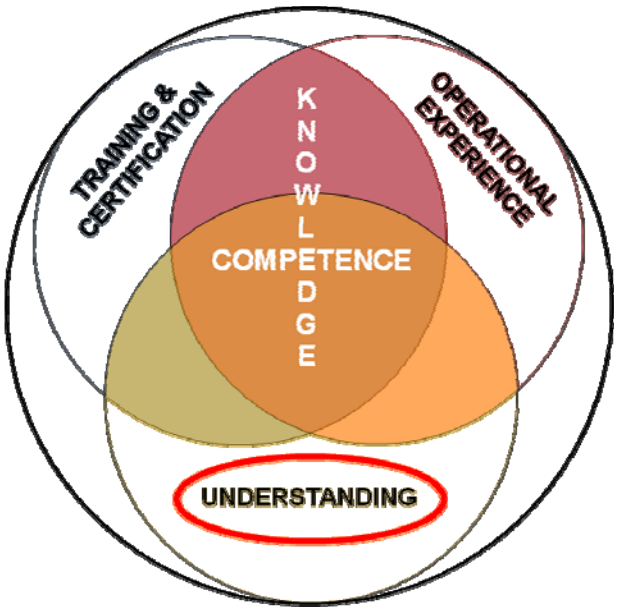
Without a doubt, each dynamic positioning operator sitting at a DP desk holds the position of immediate and critical responsibility. They must understand and operate a number of complex systems and they represent the first level of mitigation in the event of a failure. Most importantly, they represent a key barrier in fault prevention. Their level of experience, training, and understanding is of the utmost importance. However, a similar high standard of expertise and understanding can and should be expected of other DP operational personnel, as well as shore side staff tasked with the support and management of DP operations, and even Class and regulatory agencies responsible for the development and enforcement of rules and requirements.

Just as the newest vessel complete with the most technologically up-to-date equipment can only perform to the standard of its operational personnel, the industry's cutting edge DP sector can only function to the level of knowledge and expertise demonstrated by those responsible for its policies, procedures, and regulations.

THE DP PROFICIENCY DEVELOPMENT APPROACH

Currently, the perceived gaps in experience and competence assurance are most often addressed through punitive and potentially disaffecting personnel assessments and training applied as part of post-incident investigations. With the recent increased emphasis on competency assurance and assessments, a more proactive and comprehensive approach to professional development should be considered. Through a continuous improvement process such as the DP Proficiency Development Program, opportunities are provided for the development of personnel from within an organization rather than from the diminishing pool of outside resources. At the same time, the Program offers personnel additional opportunities for personal and professional growth. Rather than reactionary and training and assessments imposed after an incident, vessel owners/operators can demonstrate to charterers and clients that personnel competency is the highest priority and forms an integral part of company and vessel operations. Likewise, by promoting the understanding of DP operations and philosophy throughout the industry to the broad range of concerned parties not only will operational resources be further developed, but so will the policies, procedures, rules, and regulations that govern them.

The field of DP expertise can be divided into three distinct categories – Operational Experience, Training & Certification, and Understanding – all of which play a key role in the development of overall professional competence.



Operational Experience is largely out of the control of anyone but the individual. The amount of experience is dependent on time in the industry, the variety of vessels and operations that an individual participates in, the number and quality of Annual Trials experienced, and the amount of effort that an individual is willing to expend on their career.

Training and Certification is primarily under the governance of the industry's regulatory authorities, taking into consideration input from industry groups such as MTS and NOSAC and referencing organizations such as IMCA that have long championed a high standard of industry practices. These industry groups represent cooperative efforts among concerned parties such as vessel owners, third party consultants, and oil majors. Discussions within these groups frequently focus on the impact of training and certification requirements on manning levels. Given that there is already a lack of qualified personnel, it is understandable that consideration is seldom given to the content and quality of existing training programs. Consequently, current training regimes focus on producing the necessary numbers of certificated Dynamic Positioning Operators that know what to do, when to do it, and how to do it, but do not necessarily understand why certain actions are performed or why they are necessary.

The development of additional training programs and tightening the pre-qualification and certification requirements within the industry can increase the level of knowledge of DPOs, but knowledge in and of itself does not necessarily constitute competence. For example, knowledge without understanding will not provide a DPO with the level of situational awareness necessary to prioritize actions following a Worst Case Failure. Likewise, additional DPO focused training, competency assessments, and more stringent qualification requirements will not provide competent DP engineers or support staff. Nor will the current tendency toward DPO competency assessment provide the level of understanding and awareness necessary for shore side management and regulatory agencies to develop, apply, and enforce the relevant guidelines and appropriate requirements for safe and efficient operations.

By contrast, rather than provide additional conventional training to address perceived gaps in competency, the DP Proficiency Development Program complements existing experience, training, and qualifications. It promotes a comprehensive understanding of DP operations, redundancy philosophy, and other factors that are keys to developing and assuring personnel competence, not only of operational personnel, but of the industry at large.

DP PROFICIENCY DEVELOPMENT PROGRAM STRUCTURE, AUDIENCE, AND APPLICATION

By encouraging the understanding of dynamic positioning operational philosophy throughout the industry, the overarching goal of the DP Proficiency Development philosophy is to cultivate an environment of open communication across the broad range of concerned industry groups. While every company must maintain individual business and profit concerns, the safety of personnel, the environment, and assets is an industry priority and not a matter of competition. The establishment of a shared platform for professional development and competence assurance is – or should be – a common interest. After all, the better educated all stakeholders within the DP sector are the safer and more efficient the industry will become.

To best serve this purpose and the wide scope of concerns surrounding competency in the dynamic positioning sector, the DP Proficiency Development Program is created to be as adaptable but comprehensive as possible. The Program's modular structure provides flexibility in covering all necessary topics and provides additional supplemental material based on discussion feedback and personnel input at the time of execution, client requirements, and demonstrated gaps representing opportunities for improvement.

As an example, a program designed for application to large groups of operational personnel may consist of the following Primary Modules:

- DP Rules, Guidelines, and Recommended Practice
- DP Training and Certification Requirements
- Principles of DP and DP Operations
- Overall Redundancy Philosophy
- Elements of DP and DP Control Systems
- Position Reference System
- Environmental Sensors
- Power Generation and Distribution
- Propulsion

- Auxiliary/Ancillary Equipment and Systems
- Power Management
- Practical Operations of DP Systems
- DP Operations
- DP Incidents
- DP Drills
- DP Risk Management
- DP Maintenance and Critical Spares
- DP Documentation and Checklists
- Communications
- Emergency Procedures

A program designed for a specific vessel crew would include customized versions of the Primary and Supplemental Modules listed above, specific to the vessel and/or operations. The Modules would include in depth discussions on the vessel's FMEA, DP Operations Manual, Checklists, Charter requirements, etc. The Modules could be further supplemented by the following:

- Operational Assessments of personnel
- Practical Exercises
- Annual DP Trials as Scenario Training

Additional Supplemental Modules could include, but are not limited to:

- Specific Operations – Diving, ROV Support, Seismic, Cable Laying, etc.
- Specialized Operations – Military/Government
- Critical Activity Mode of Operation (CAMO)
- Activity Specific Operating Guidelines (ASOG)
- Simultaneous Operations (SIMOPS)
- Simulator Training

Complete programs are developed using the relevant modules as determined by specific needs and applications. Programs can be further customized ad hoc by adding or subtracting modules at the time of presentation. Personnel tasked with administering the program rely heavily on discussion and feedback, both to determine the areas of needed instruction and interest, as well as to foster communication and mutual understanding between departments.

All vessel personnel involved in DP critical operations are accountable for maintaining a level of competency in line with their respective responsibilities on board a vessel. These include not only certified Dynamic Positioning Operators, but also DP engineers, electricians, and ETOs. These personnel are too often ignored in training and certification regimes in favor of the more visible DPOs. It can be argued, however, that the competency of DP engineers, responsible for the correct power distribution and redundancy configuration of increasingly complex DP vessels is of similar or equal importance to the competency of DPOs relying on the correct function of those systems. When applied to vessel personnel, programs are designed to be comprehensive and are intended to include both Bridge and Engineering staff.

Basic knowledge assessments can accompany each module and are administered before executing the program to determine the level and type of instruction needed, afterwards to evaluate absorption of the material, or both. Rather than using these assessments to determine competence vs. incompetence of operational personnel, results are used to assist in the evolution of the program itself by appraising course content and materials, and the various elements of the presentation and application of the program.

By organizing it around a modular structure the program is not only flexible in content but also in application and timing. It can be applied on board vessels, in office conference rooms, or in formal classroom settings. Operational personnel can be addressed on board specific vessels on a shift by shift basis or surrounding crew change to cover all personnel. In cooperation with system providers, DP simulators can be incorporated into the program to cover multiple crews in a shore side application.

Trade schools, training facilities, and even maritime academies can incorporate the DP Proficiency Development approach as supplemental program to The Nautical Institute approved DP Basic Course (or the recently unveiled DNV training scheme) that incorporates practical training and exercises using available simulators.

As a specific example, it is noteworthy that with the pre-qualification requirements recently put in place by NI linking DPO training with STCW, a whole sector of the industry consisting of vessels falling below the 200-ton minimum has been overlooked. Personnel meeting the lower licensing requirements are not able to receive even the basic training necessary to operate these smaller, but still DP capable vessels. In cooperation with established training facilities utilizing DP simulators, and with the approval of USCG and/or NI, DNV, etc., the DP Proficiency Development Program may provide an alternative route to obtaining approved certification for vessels and personnel.

The Proficiency Development Program can be applied to non-vessel operational personnel in a local office or classroom setting or at a centralized location. A comprehensive program goes beyond training vessel personnel and can include shore side support staff and management personnel, charterers, and clients. By developing the competency of the variety of resources involved in operations and streamlining communications between shore side and offshore assets through better understanding, overall efficiency will be improved.

Management will likewise obtain a better understanding of external industry guidelines and requirements improving the efficacy and applicability of internal policies and procedures. Clients and charterers can improve safety and reliability by minimizing the ambiguities within bridging documents created by diverse assets, locations, and operational variables.

Structured similarly to programs designed for operational personnel, a DP Proficiency Development Program designed for application with shore side support staff and management may consist of some of the same Primary Modules, but with added emphasis on support operations, policies, and procedures:

- DP Rules, Guidelines, and Recommended Practice
- DP Training and Certification Requirements
- Principles of DP and DP Operations
- DP Operations Management
- DP Incident Investigation and Reporting
- DP Drills and Training
- DP Maintenance and Critical Spares
- DP Documentation and Checklists

Additional Supplemental Modules could include, but are not limited to:

- Specific Operations
- Specialized Operations
- Incident Case Studies
- Critical Activity Mode of Operation (CAMO)
- Activity Specific Operating Guidelines (ASOG)

Just as shore side management teams profit from a better understanding of DP operational philosophy in the development of guidelines and requirements, so will Class and regulatory agencies that design and enforce the wider rules and regulations that govern the DP sector. Surveyors tasked with the responsibility of enforcing regulation or with verifying compliance to rules and guidance including Class, Flag State, and third party consultants can utilize the program as a core training regime for new personnel and a continuous improvement platform for experienced personnel.

Most importantly, the DP Proficiency Development Program provides a common forum for discussion surrounding opportunities for improvement within the industry. By applying the program across a wide variety of industry groups, it can provide a common point for feedback and a platform for input from across a representative range of industry groups. This feedback can be used to develop more effective, more appropriate, and perhaps more agreeable policies and regulations.

CONCLUSIONS

As the offshore industry celebrates the 51st anniversary of dynamic positioning technology, it must reconsider its attitude toward DP if it is to remain current with the evolving technology. Despite the demonstrated importance and relevance of dynamic positioning technology, many industry groups continue to view DP as a distraction from

primary company goals, choosing to deal with it on an as needed basis but otherwise viewing it as secondary to overall operations. This inevitably promotes an attitude of complacency at every level of the industry.

The substantial growth of the DP sector over the past decade and all-too-regular but preventable DP incidents have only recently brought the significance of competency to the forefront of industry concern. The latest efforts at providing competency assurance are, unfortunately, only rarely the result of careful consideration on the part of a few forward looking companies and industry bodies. The majority of assessments and additional training often stem from incidents and near misses and aim to demonstrate that a company has addressed a perceived gap between what an individual DPO's actions were versus what those actions should have been.

Post-incident assessments of qualifications and competency now form a permanent part of incident investigations, almost inevitably followed by additional DPO training. This common reaction to issues surrounding DP personnel competence tends to address the prima facie evidence of DPO incompetence rather than what may be a more significant, though perhaps indirect, underlying cause. Further, it holds the potential to disaffect personnel by imposing a perceived punishment upon a crew, vessel, or company. As with any situation that involves the human element, there will always be a need for investigative processes and additional training in DP operations. However, by taking a proactive and more comprehensive approach to personnel development, companies and the industry as a whole can benefit from a positive learning environment by breaking the link between training and punishment.

Most DP operational personnel are competent. They are intelligent, qualified, and capable personnel. In courses that extend ten short days, DP Operators have been trained to know how to operate a DP 1, 2, or 3 vessel but rarely leave training facilities with adequate understanding of the fundamentals of DP operations, DP redundancy philosophy, emergency procedures, or the full consequences of actions while seated behind a DP desk. Likewise, the nature of the policies, procedures, and requirements enacted by many operators, charterers, and regulatory agencies increase the potential risk of placing DP operational personnel into unfavorable and altogether avoidable situations.

It is noteworthy that discussions within industry groups surrounding training and certification of personnel rarely include direct representation of DP operational personnel – the group most directly affected by training program content and the training and certification guidelines and requirements. By fostering a cooperative relationship within the industry, Proficiency Development programs offer a platform for DPOs and other DP critical personnel to voice their concerns regarding their own training and certification.

The high demand for personnel strains existing training programs and facilities. Facing an already limited pool of resources and with client satisfaction and profits at stake, training providers must produce results in a short amount of time, with limited options for thoroughly vetting graduates from their programs or even vetting the content and applicability of the programs themselves. Virtually all current training and certification requirements and recommended practice focus entirely on dynamic positioning operators and otherwise ignore DP engineers, support staff, and shore side management. Beyond the purely operational aspects of competency, shore side management teams must provide the preemptive protective barriers to incidents through the development of intelligent and applicable policies and procedures. These guiding principles of operation should serve as the decision support tools that assist operational and support staff

The DP Proficiency Development philosophy champions a positive, proactive approach to professional development. While the Program can be, and has been, used as a reactionary assessment of personnel competence, the most important element of the DP Proficiency Program is that it is a preventative approach, providing assurance of operational readiness and capability at every level of a company and industry. DP Proficiency Development builds on training, qualifications, and experience that personnel have already obtained, concentrating on the continuous development of personnel competence as a means of assessment. The purpose of the DP Proficiency Development approach is not only to provide continuous evidence of personnel competence but, more importantly, its goal is to demonstrate tools that already at their disposal. Further, it actively demonstrates a company's dedication to developing its single most important resource – its people.