Competency Assurance Framework – First Year in Review

Bolshoy Bhattacharya

9th October 2018

London Offshore Consultants

- Marine and Engineering Consultant since 1979
- High quality service
- International and Diverse Projects
- 400 professionally qualified staff members

Dynamic Positioning

LOC has various personnel engaged in DP activities in the sectors of:

- Shipping
- Oil and Gas
- Renewables
- Yachts

Diverse Skills

- Masters Marines
- Chief Engineers
- Electrical Engineers
- Control System Specialists
- Naval Architects

Multi-disciplinary

A Tale as Old as Time

The dilemma of the ages:

Do I have the competence _____?

a. To slay the dragon
b. To rescue the princess
c. To lead a revolution
d. To ensure incident free DP operations

The Team

Answer the question, “Why are we the ones to solve the problem we identified?”

Bolshoy Bhattacharya

Senior Engineer

Dynamic Positioning

Abhayasinghe Senananda

Global Technical Authority

Dynamic Positioning

DP FMEA Industry Stakeholders

Who has the money:

- The owner will be the paying customer however, the shipyard will select the FMEA provider
- Potential number of DP vessels in the world 4000-6000 vessels

Who shares the risk:

- Energy companies and vessel owners
- Low quality of and lack of confidence in existing DP services

Who does not share the risk:

- Shipyard that selected the FMEA provider and carried out the FMEA process
- Classification societies for having approved the DP FMEA
- DP solutions providers who create the deliverables

Loss of Position

Mumbai High North

- MSV Samudra Suraksha collides with MHN platform on 27th July 2005
- 22 reported dead (11 fatalities and 11 missing). Damages upwards of 200m USD.
- Accounted for 10% of India's domestic production

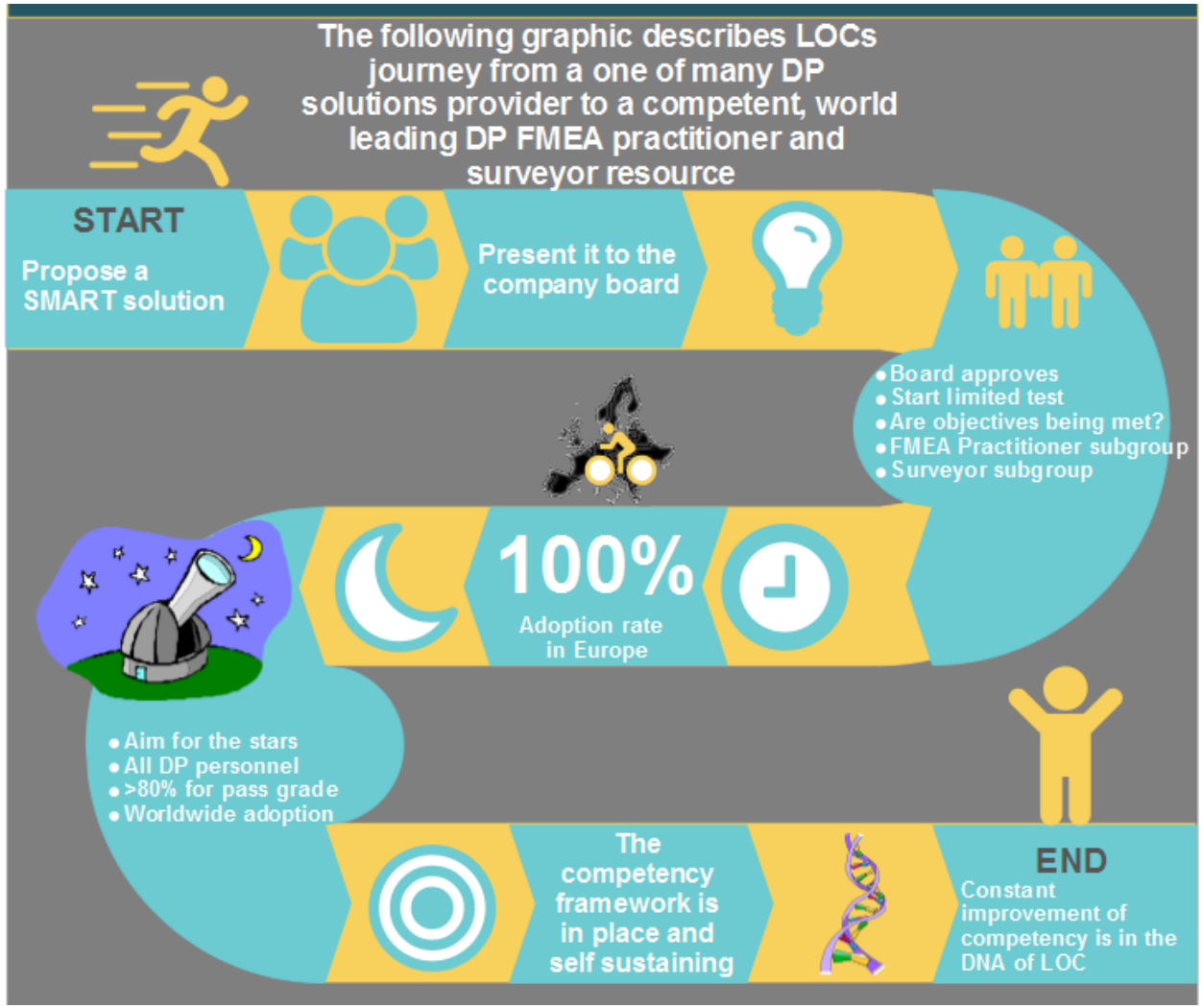
LOC

DP Services

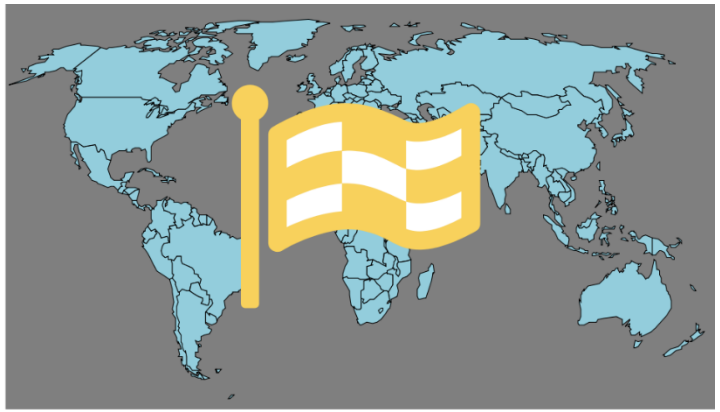
- DP Consultant
  - DP FMEA
  - DP FMEA Proving Trials
  - Annual DP Trials
  - DP Operation Manual
  - FMEA and Criticality of control systems
  - Load Analysis
  - Design / Drawing reviews
- DP Surveyor
  - Vessel Assurance
  - Suitability Surveys
  - ASOG / WSOG development
  - Gap Analysis Tools
  - LFI and other DST

A multidisciplinary approach is a must for all of the above deliverables

The Journey of LOC

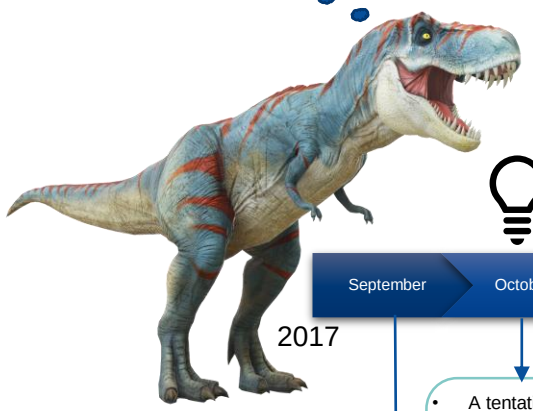


The end goal is to have a living, growing competency assurance framework (CAF) in place that would imbibe itself in the culture of the company and inculcate its employees, both old and new, with a spirit of self improvement and constant learning



Project Timeline - Present

How do I scratch my nose?



2017

September

- A prospective problem was identified.
- This was not only within the company but in the DP industry as a whole

October

- A tentative solution was brainstormed.
- Tier based structure called the Competency Assurance Framework

November

December

2018

- Paper outlining the CAF is submitted to the board of directors
- CAF evolves into training identification and career supplement

January

February

- Final approved document released for implementation
- Documents DP Consultant and Surveyor paths with a 3 tier system

March

- Initial subjects chosen to undergo assessment
- Capabilities of individuals highlighted and feedback received on the assessment process

April

- CAF is applied across Europe and Africa, tangible results.
- Other bodies like IMCA and MTS are coming out with guidance on competence for DP solutions providers

May

June

July

- Constant tuning of CAF with adoption of guidance documents into the framework.
- Next step to test newly modified framework and then apply worldwide

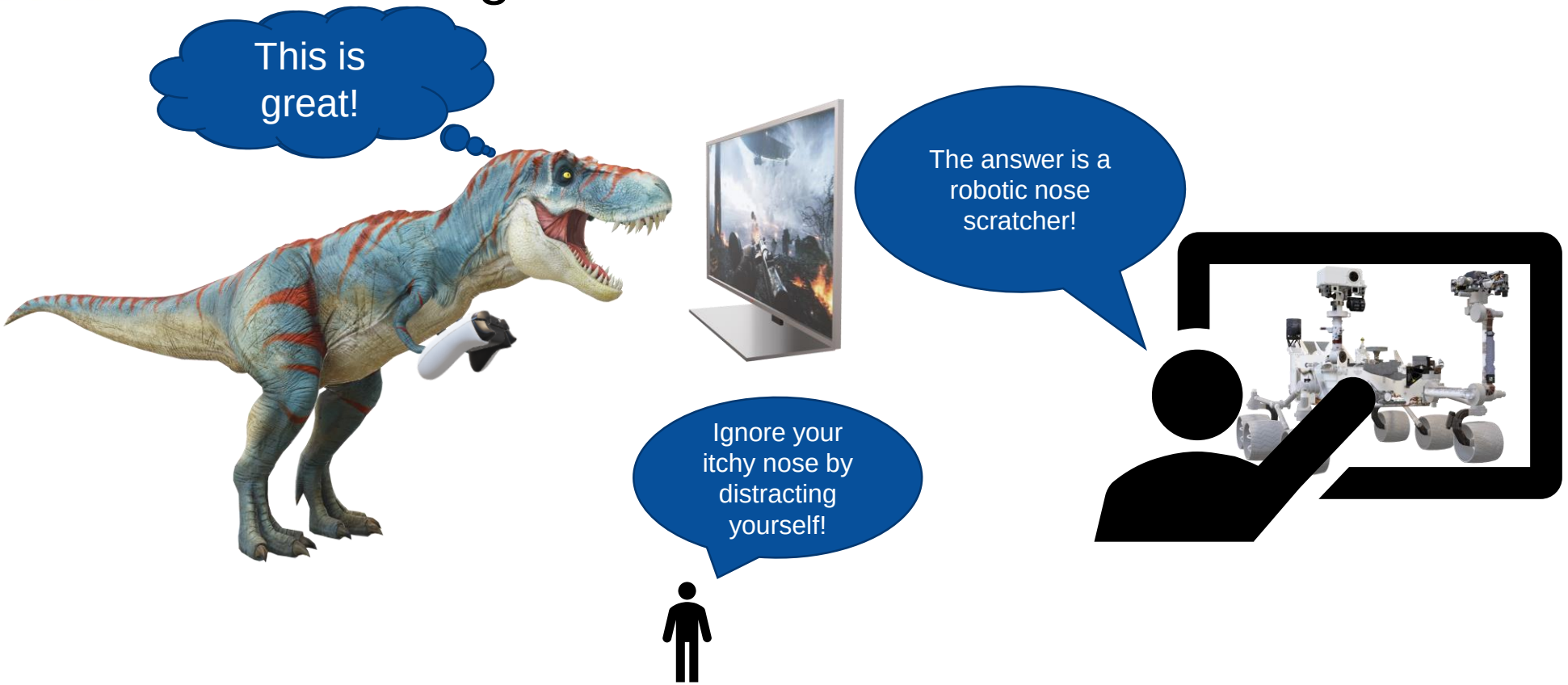
August

September

Timeline – Contd..

- September 2017: A prospective problem was identified. This was not only within the company but in the DP industry as a whole
- October 2017: A tentative solution was brainstormed. Tier based structure called the Competency Assurance Framework
- December 2017: Paper outlining the CAF is submitted to the board of directors. CAF evolves into training identification and career supplement
- February 2018: Final approved document released for implementation. Documents FMEA Practitioner and Surveyor paths with a 3 tier system
- March 2018: Initial subjects chosen to undergo assessment. Capabilities of individuals highlighted and feedback received on the assessment process
- April – May 2018: CAF is applied across Europe and Africa, tangible results. Other bodies like IMCA and MTS are coming out with guidance on competence for DP solutions providers
- June – August 2018: Constant tuning of CAF with adoption of guidance documents into the framework. Next step is to test newly modified framework and then apply it worldwide

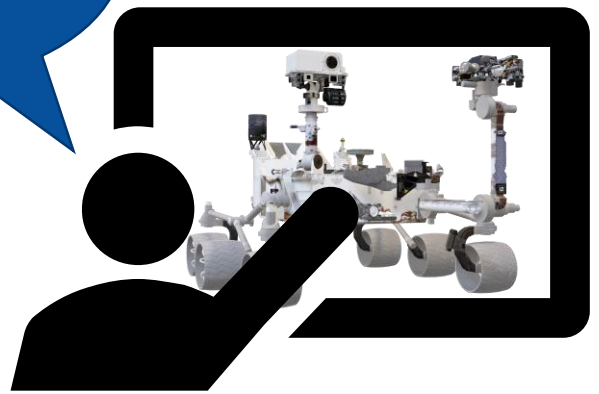
Brainstorming



Brainstorming

My nose is itching again..

The answer is a robotic nose scratcher!



Ignore your itchy nose by distracting yourself!

Brainstorming

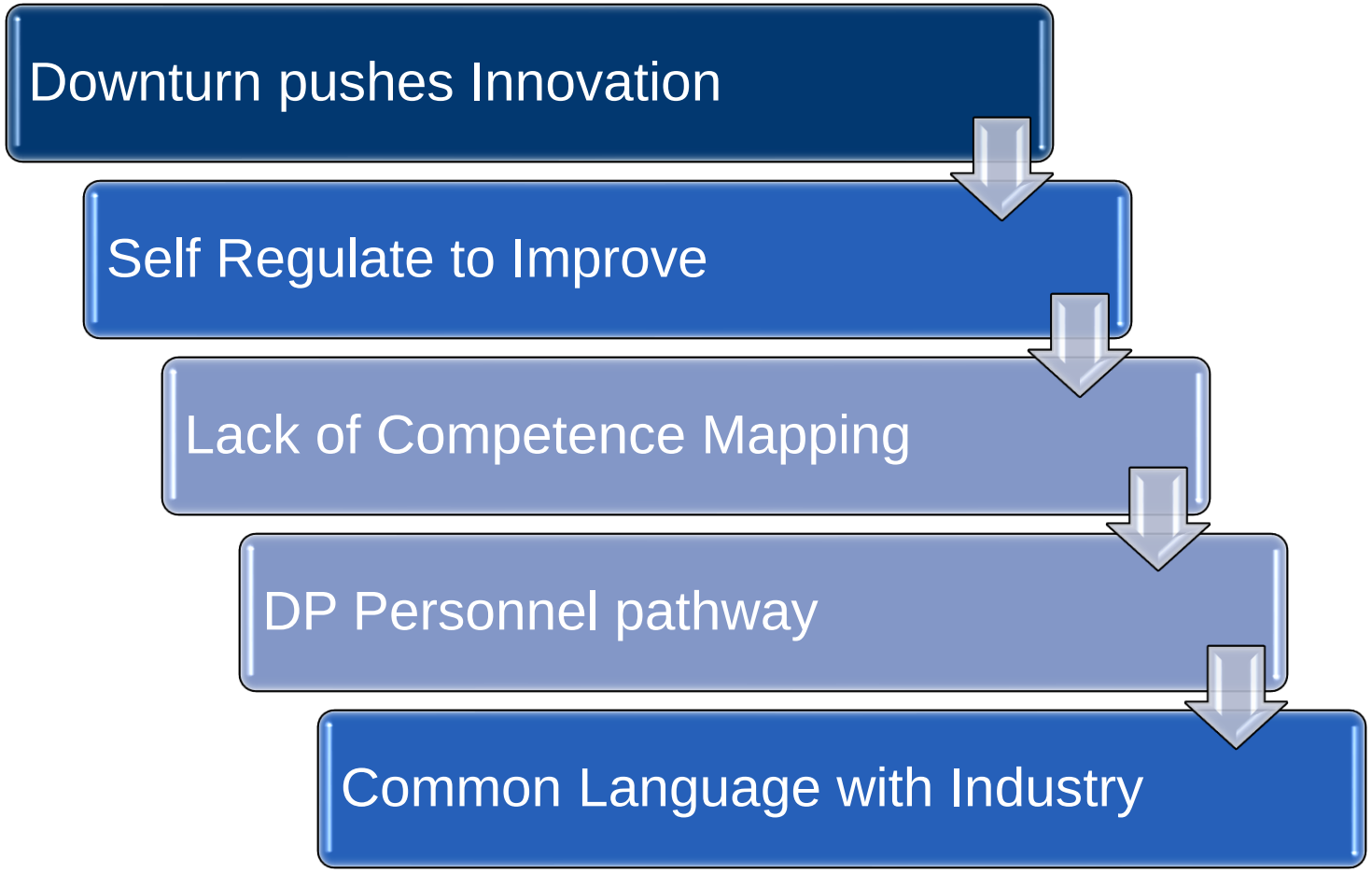
Brainstorming

Brainstorming

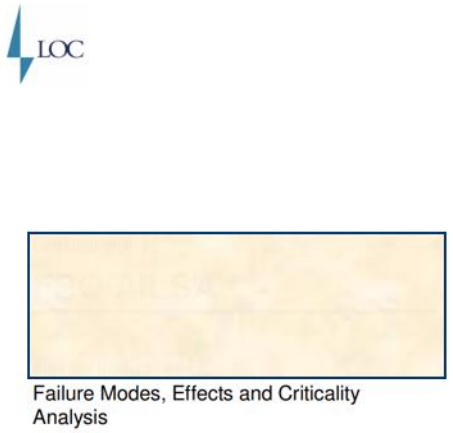
LOC

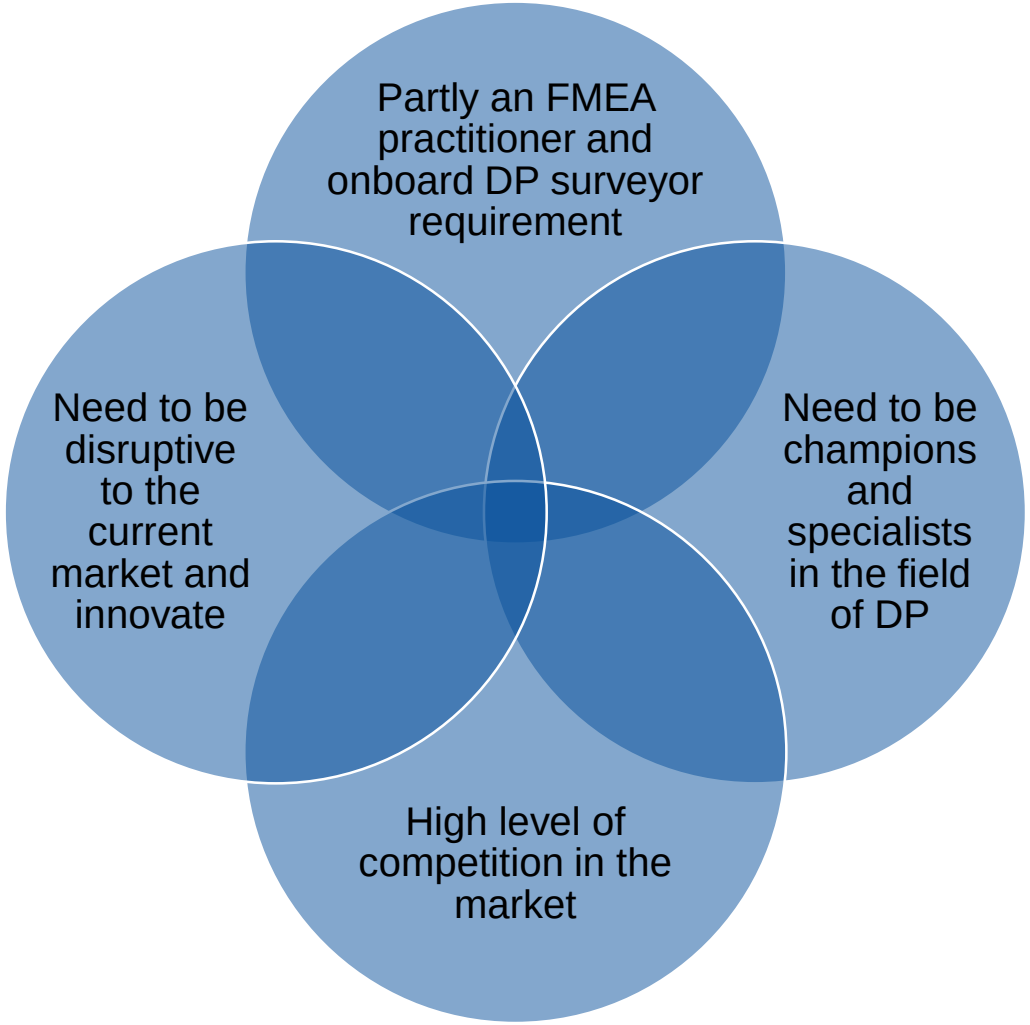
SMART Solution

Self Improvement Drive



Introduction to the Solution





SWOT analysis

Strengths

- Provide tangible path for employee progress
- Identifies employee strengths and weaknesses
- Transparency to the clients
- Pushes employee to strive to better knowledge and expertise
- Modular and thus can easily be adapted to new fields and requirements

Weaknesses

- Transparency to the clients
- Resource hungry without quick ROI
- Ties up important revenue generating resources
- Questioning experience and competence can become tumultuous

Opportunities

- Novel to the DP market
- Transparency prevents a race to the bottom
- Proven experience and competence to help improve brand and image
- Identify employee training requirements
- Motivate employees with career progression through knowledge expansion
- Ability to penetrate emerging markets due to proven methodology

Threats

- Can be misunderstood by clients if not marketed correctly
- Can identify poor competence within the workforce which may require drastic actions to be taken
- Can be used as a means to limit employee progress
- Can create loss of work due to lack of competence in the workforce

SWOT Analysis - Strengths

- Provide tangible path for employee progress
- Identifies employee strengths and weaknesses
- Transparency to the clients
- Pushes employee to strive to better knowledge and expertise
- Modular and thus can easily be adapted to new fields and requirements

SWOT Analysis - Weaknesses

- Transparency to the clients
- Resource hungry without quick ROI
- Ties up important revenue generating resources
- Questioning experience and competence can become tumultuous

SWOT Analysis - Opportunities

- Novel to the DP market
- Transparency prevents a race to the bottom
- Proven experience and competence to help improve brand and image
- Identify employee training requirements
- Motivate employees with career progression through knowledge expansion
- Ability to penetrate emerging markets due to proven methodology

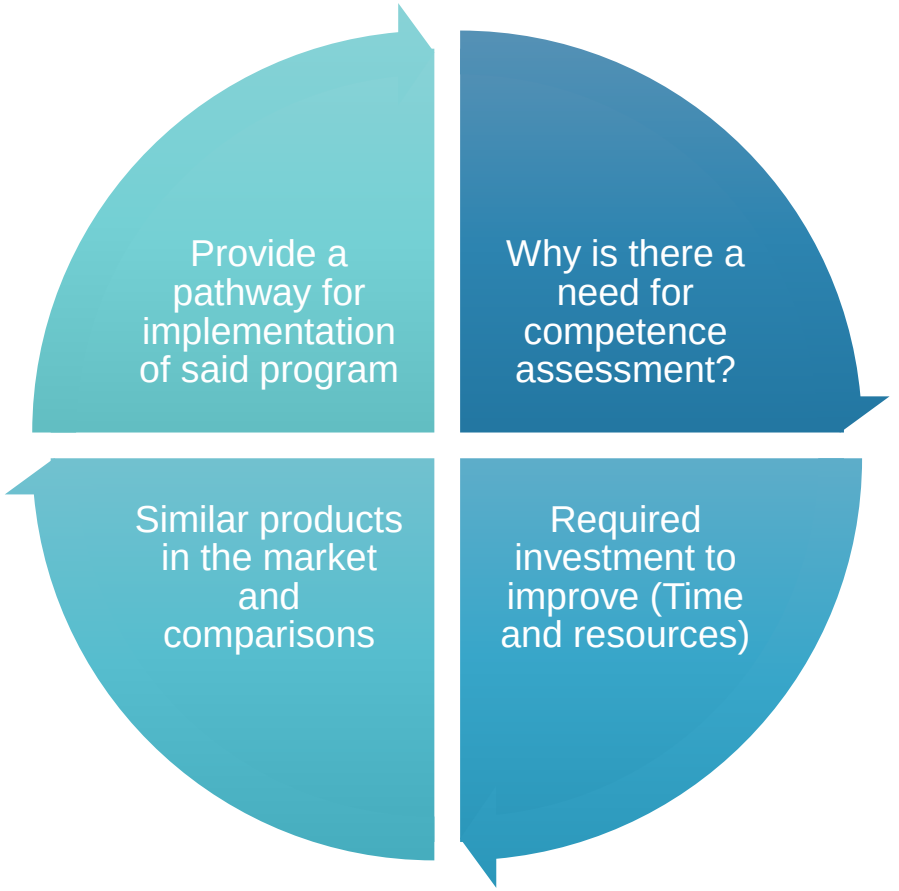
SWOT Analysis - Threats

- Can be misunderstood by clients if not marketed correctly
- Can identify poor competence within the workforce which may require drastic actions to be taken
- Can be used as a means to limit employee progress
- Can create loss of work due to lack of competence in the workforce

Results Breakdown

- Strengths and weaknesses could be misconstrued
- Same with opportunities and threats
- Proper management and understanding was key
- The framework had to clarify specific objectives and purpose
- Miscommunication of the objectives was not an option
- There was no precedence and thus the documentation would have to be comprehensive
- A change towards constant and sustainable growth of competence was a clear and defined positive

Initial Proposal

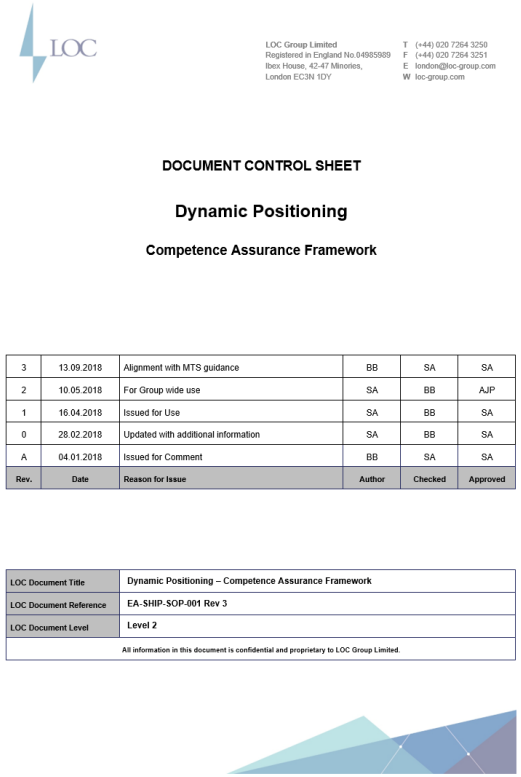


Into the belly of the beast

The preparations are done, and we are ready to venture forth into the dark and cold unknown:

Implementation

Implementation



LOC Group Limited
Registered in England No.04985989
Ibex House, 42-47 Minories,
London EC3N 1DY

T (+44) 020 7264 3250
F (+44) 020 7264 3251
E london@loc-group.com
W loc-group.com

DOCUMENT CONTROL SHEET

Dynamic Positioning

Competence Assurance Framework

Rev.	Date	Reason for Issue	Author	Checked	Approved
3	13.09.2018	Alignment with MTS guidance	BB	SA	SA
2	10.05.2018	For Group wide use	SA	BB	AJP
1	16.04.2018	Issued for Use	SA	BB	SA
0	28.02.2018	Updated with additional information	SA	BB	SA
A	04.01.2018	Issued for Comment	BB	SA	SA

LOC Document Title	Dynamic Positioning – Competence Assurance Framework
LOC Document Reference	EA-SHIP-SOP-001 Rev 3
LOC Document Level	Level 2

All information in this document is confidential and proprietary to LOC Group Limited.

Competency refers to ability, skill and attributes that are associated with job performance

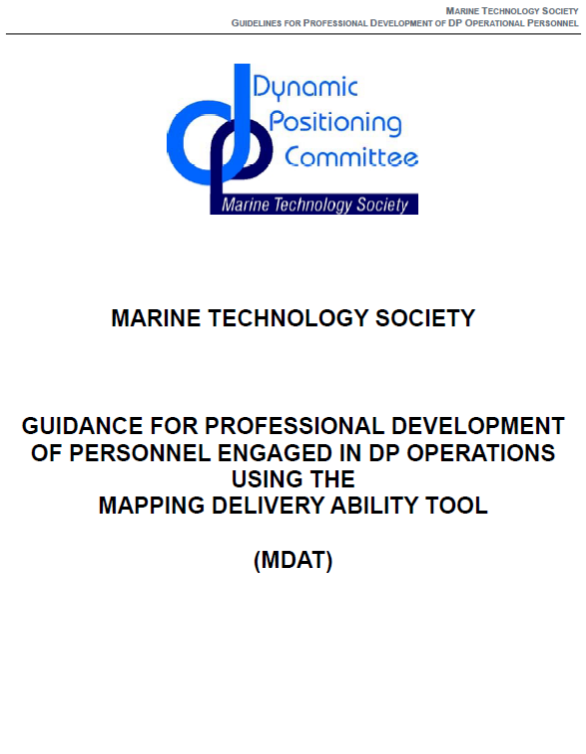
Competencies are defined in terms of behaviours

LOC considers both Core Competence and Technical Competence

Core competencies are not discussed in this document

Technical competencies are the knowledge and abilities required to achieve results based on the defined competence levels of DP practitioners

Competence Mapping



AWARE:- Able to explain, describe, discuss, identify, locate and report on the area of knowledge and its relevance, potential impact and consequences to the operations associated with the industrial mission.

KNOWLEDGEABLE: Able to demonstrate understanding of the terminology and vocabulary in the area of knowledge. Able to demonstrate understanding of the operations associated with the industrial mission and potential impact, consequences. Able to execute planned procedures. Able to plan, prioritize and adapt to evolving situations.

SKILLED: Able to translate guidelines and standards in the area of knowledge and its relevance to the operations associated with the industrial mission and potential impact, consequences into practical actions. Able to develop review and modify procedures in the area of knowledge. Able to evaluate, differentiate, discriminate, validated and communicate solutions to common technical and operational problems. Provide mentorship and training in the area of knowledge, relevant to the industrial mission.

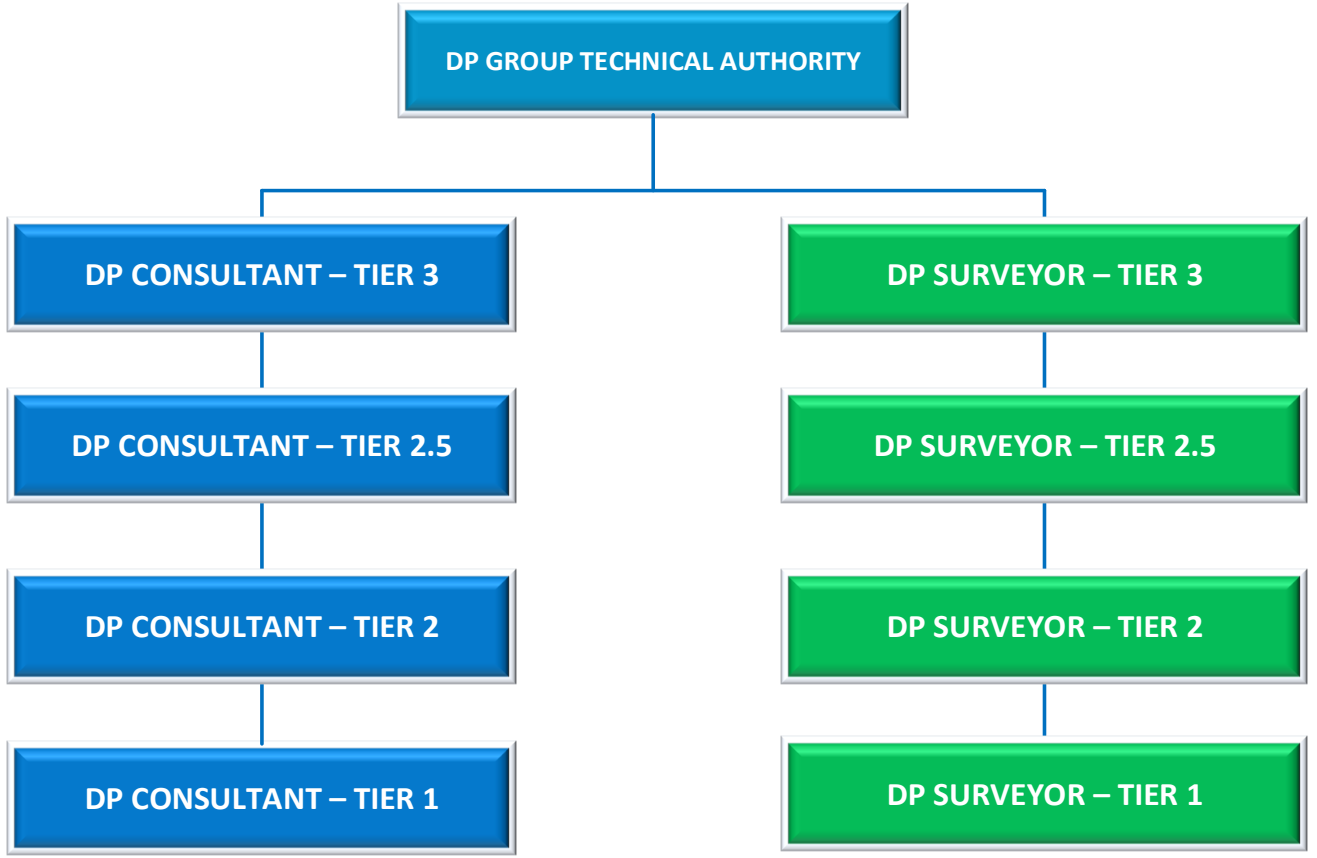
CAF – Tier Levels

3 Tier system based on competence requirements

DP Consultant path is multidisciplinary with a focus on Mechanical, Electrical and Control Systems

DP Surveyor path has a focus on operational activities and support

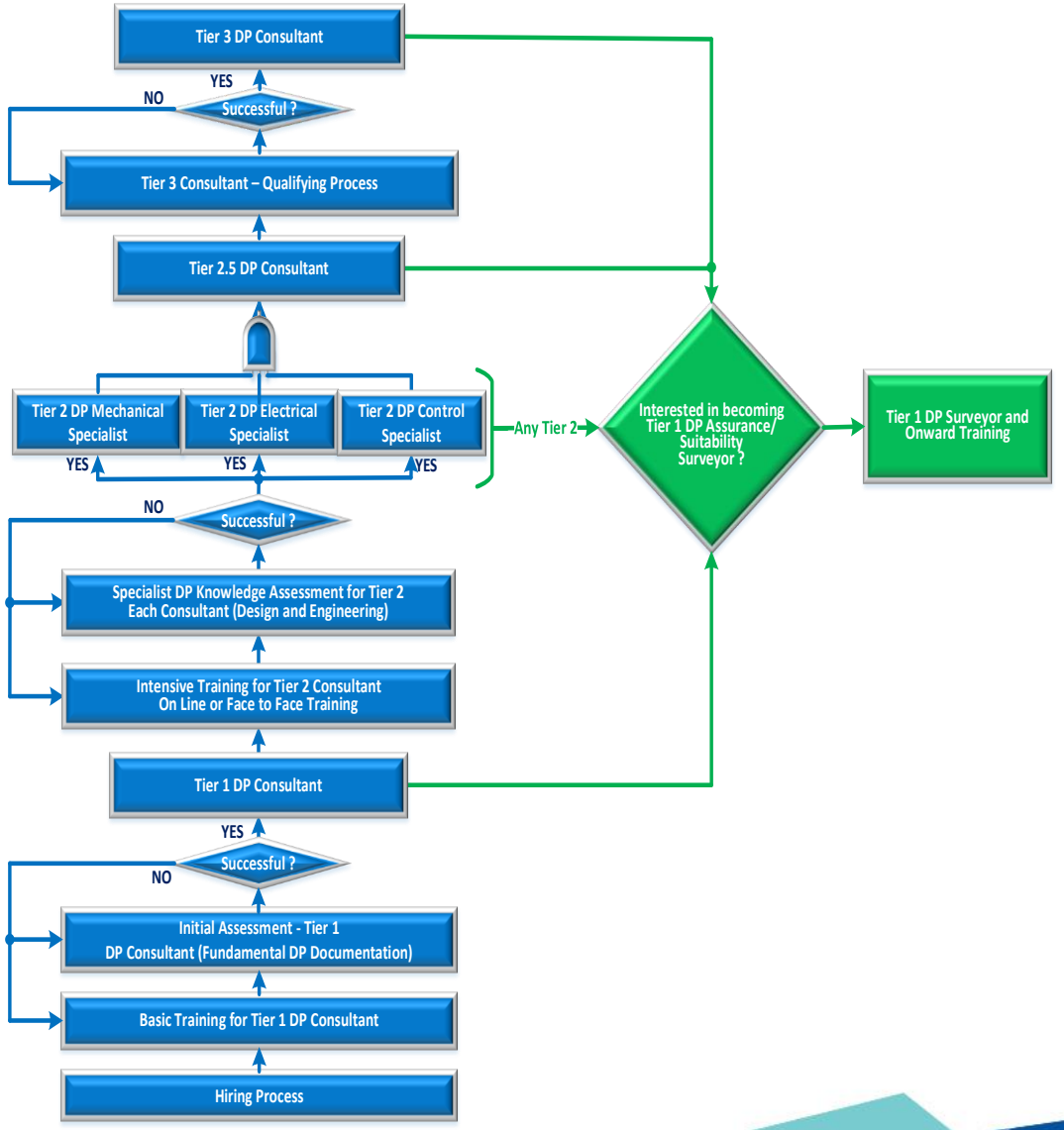
Paths are not exclusive and each individual can be mapped separately on both DP Consultant and DP Surveyor paths



CAF – DP Consultant

Tier 1-3:

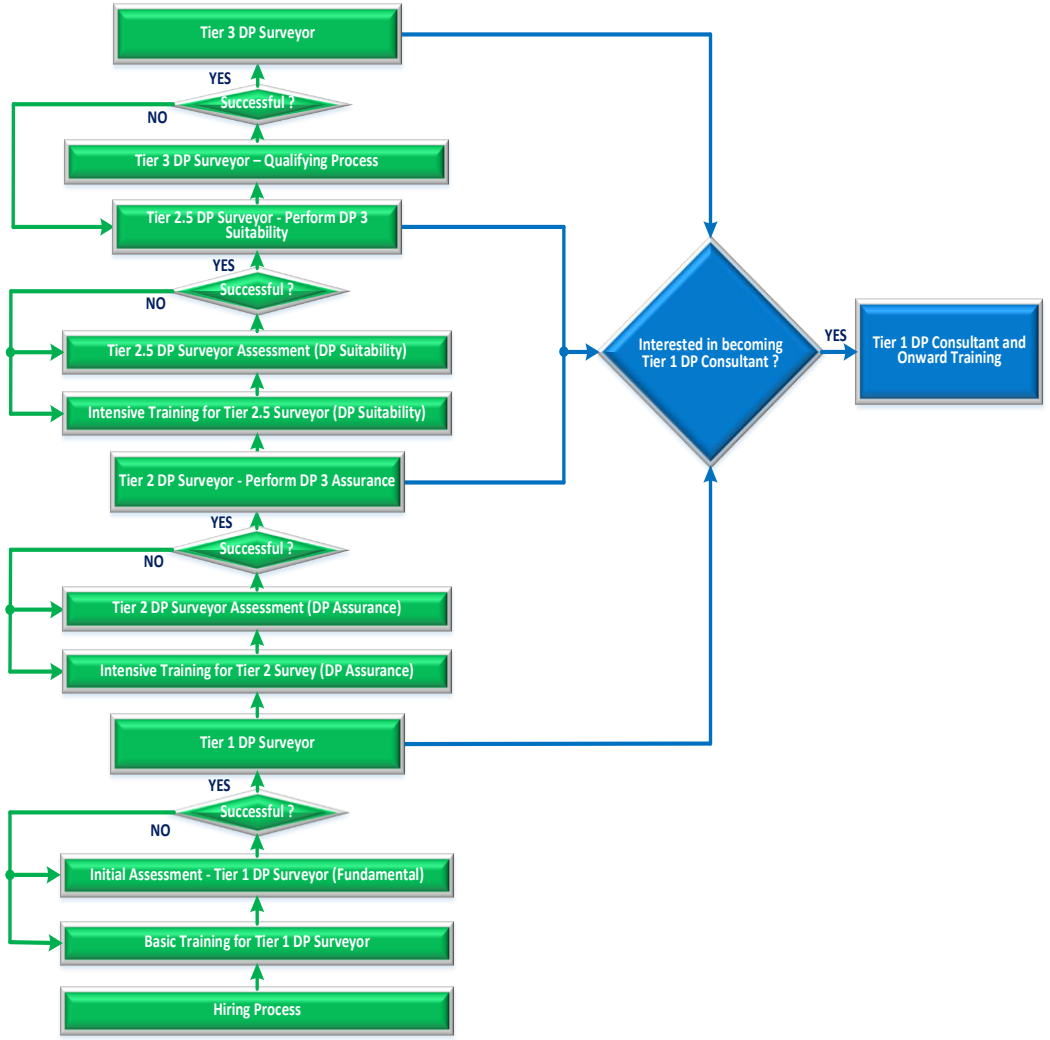
- Begins from recruitment process
- 80-120 hours of training (Self learning documentation pack)
- Becomes Tier 1 after initial assessment (70% pass)
- Tier responsibilities enumerated (Unsupervised and supervised)
- Competence mapped into Aware, Knowledgeable and Skilled



CAF – DP Surveyor

Tier 1-3:

- Begins from recruitment process
- 80-120 hours of training (Self learning documentation pack)
- Becomes Tier 1 after initial assessment (70% pass)
- Tier responsibilities enumerated (Unsupervised and supervised)
- Competence mapped into Aware, Knowledgeable and Skilled



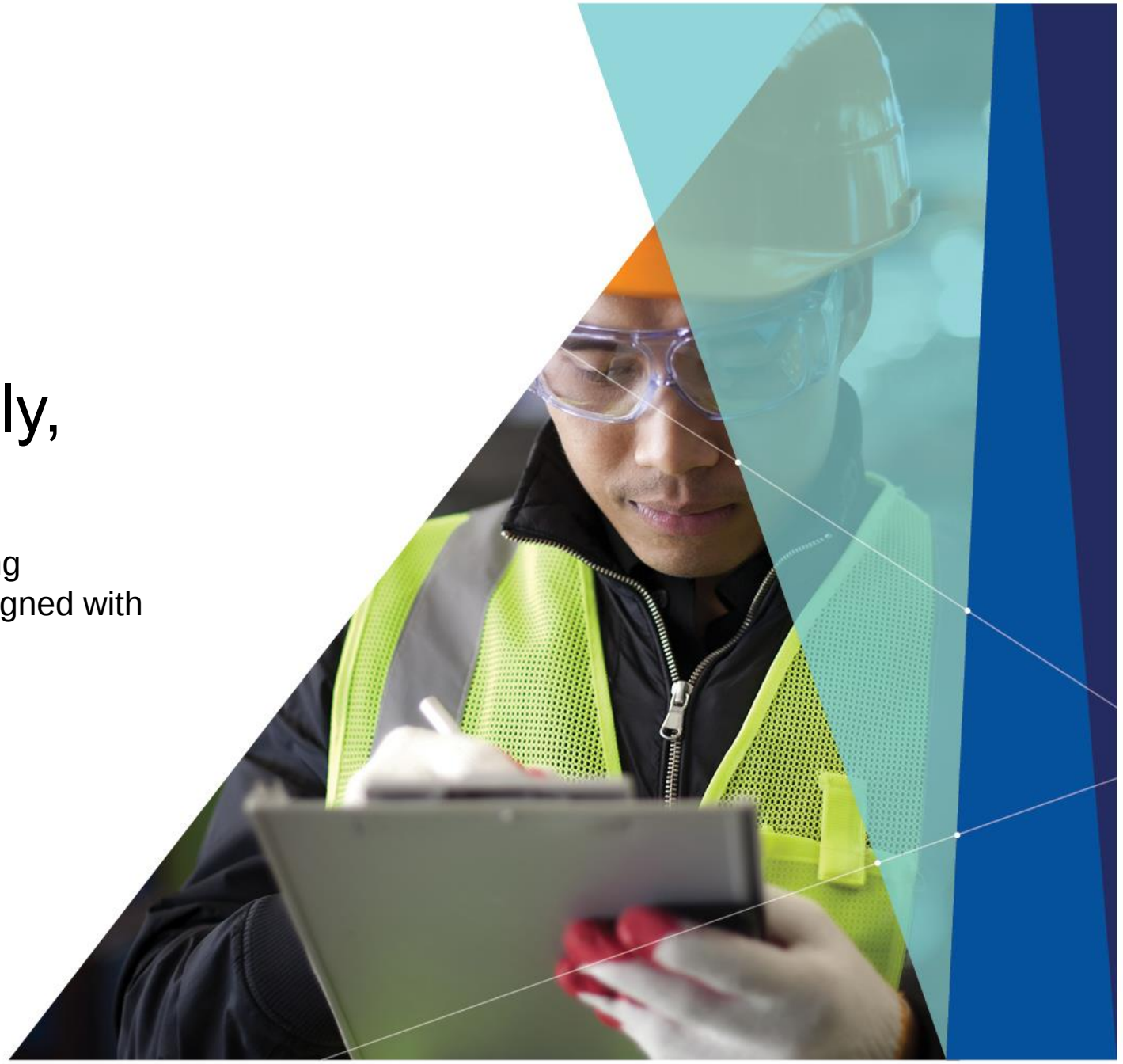
Employee Testimony – Tier 1 and Tier 2 DP Consultant

- “Training material provided to prepare with relevant competency elements was well thought out.”
- “Assessment carried out in differing methods. Straight forward question answer sessions along with mock FMEA run through. This was supplemented with constant ongoing review of work done under supervision. Overall, a good way to expand my skill set!”

- Brett Stewart
  (DP Electrical Engineer)

“The woods are lovely, dark and deep.”

New industry standards come in regarding competency and the CAF needs to be aligned with these.



TECHNICAL AND OPERATIONAL GUIDANCE (TECHOP)

TECHOP_ODP_16_(P)
(COMPETENCY ELEMENTS FOR DP PROFESSIONALS - DP SMEs / DP FMEA PRACTITIONERS)

APRIL 2018

DRAFT

MTS TECHOP ODP 16

Competency Elements for DP Professionals – DP SMEs / DP FMEA Practitioners

Gap Analysis Results

To summarise, the CAF was found to have the following gaps:

- Align tier system with the Techop
- Align competence elements with the Techop
- Adopt interview based assessment in addition to written and review based
- Specific training and career path to be highlighted

Gap Check - LOC DP Competency Frame work to MTS TECHOP ODP 16 (P)

Row	MTS Section	Requirement	LOC Framework Section	Requirement	Gap (R/Y/G)
1	Main intro	It is only a guide for companies to develop their own system of assessment. An example of areas to cover is included as is a pilot scheme	1	Section 1 outlines the applicability, a brief intro and frame work description, including the key competency funnels (Consultant and Surveyor) c/w tier levels in each area. Key in the MTS guidance is that the system needs to be suitable for the business in which is will be used. The TECHOP is set-up to recognise charterers SMEs and vessel owners' FMEA practitioners. LOC services mirror that to a point - particularly on the FMEA practitioner side, though we often provide expertise to the Client's SME. It is not often that LOC acts as the SME for its clients though we should be ready and able to demonstrate our capability and competence. Overall, the 'Surveyor' funnel side needs further consideration to reach a SME level (based on the TECHOP definition)	
2	App 1 DP SMEs Summary	TECHOP provides general guidance on subjects which prospective DP SMEs should become proficient.	1	See above	
3	1.1 & 1.2	Competence and proficiency scale (3-tiers Knowledgeable, skilled and mastery for SME and 2 others below that at Aware and Not Aware)	2	Competency levels are laid out from Tier 1 to Tier 3. They do not match the TECHOP but do match the way we recruit and train our personnel and eventually deliver the work we are awarded. TECHOP does not differentiate between the skill sets, and competency in each, whereas the LOC Tiers do. The LOC process fits closer to the IMCA FMEA writing requirement of multiple competencies to prepare the study. We need to be cognisant of the IMCA requirements as well as MTS without diluting the result. The TECHOP level of DP FMEA practitioner matches the LOC DP consultant tier 2.5 (+/-). The match between the SME and the DP Surveyor funnel is less clear. Though I am not convinced that we need to match it fully for all our work, at the Tier 2.5 and 3 we must see the TECHOP DP SME as a minimum standard to achieve. This way providing high level consultancy to oil majors is possible and demonstrable. The system needs to suit our business which it does. Close monitoring after start-up is required. There maybe work to do for the Tier 2.5 or 3 and this should be assessed.	
4	1.3	DP SMEs shall demonstrate core competencies against a prescribed scale: 4 at Mastery, 3 at skilled, 2 at knowledgeable	2	The direct comparison between LOC's Tiers and TECHOP core competencies is not possible because of the explanation given in row 3 above. The use of the TECHOPs 9 core competencies and levels required is a good basis for the Tier 2.5 or 3 and above in the LOC process. This should be confirmed	
5	1.4	Proof points' for each skill level	2	LOC Tier levels in each skill area suggests a measurement tool for technical competence. Based on points raised in rows above the gap is not relevant	
6	2.1	Core DP competencies - 9, 3 of which are required to be at mastery level: Deliverables and decision support tools; barrier philosophy & defence in depth; DP guidance & basis of requirements.	2	Outwith the main difference outlined above between MTS and LOC's systems, the MTS objective of 'effective delivery of incident free DP operations with predictable outcomes' is important and should be the goal of LOC's process as well. Reference to MTS TECHOPS (and IMCA) should be made. Use of the Core Competencies in the MTS document should be considered for the assessment of training needs for LOC personnel. This includes the use of the Appendix B checklists which are detailed and seemingly comprehensive.	

List of Core Competencies

The MTS Techop introduces a list of core competencies for DP SME and FMEA Practitioners.

This is found to be slightly limiting based on LOCs current structure. However, the core competencies have to be aligned with the technical competencies in the CAF.

The next step is to perform a gap analysis and find the items that need to be adopted into the CAF from the Techop.

COMPETENCY NUMBER	DP SME CORE DP COMPETENCY	FMEA PRACTITIONER CORE DP COMPETENCY
1	Deliverables and decision support tools	Deliverables and decision support tools
2	Barrier philosophy & defense in depth	Barrier philosophy & defense in depth
3	DP concepts	DP concepts and engineering
4	DP guidance & basis of requirements	DP guidance & basis of requirements
5	Verification and Validation	Verification and validation
6	In Execution Support	Power Plant configured as a Common Power System (Closed Busties)
7	Impacts on Station Keeping on the Industrial Mission	Cross connections, External Interfaces and Influences
8	Impacts of the industrial mission on station keeping	In execution support
9	Defining, Identifying and managing interfaces relevant to DP station keeping	Industrial Mission (Impacts and Management)
Required Competency Levels	• Four at Mastery • Three at Skilled • Two at Knowledgeable	• Four at Mastery • Two at Skilled • Two at Knowledgeable • One at Aware

- Competencies marked in **red font** are required to be at Mastery level.
- DP FMEA practitioners intending to carry out unsupervised work on analysis of vessels operating with closed busties must have Mastery in Competency 6 – 'Power Plant configured as a Common Power System (Closed Busties)'.

DP SME Expectations

- The MTS Techop introduces the mastery level in addition to those in MDAT
- The CAF needs to be retuned to suit the new skill levels mentioned here
- Each tier level needs to remapped
- Tier 2 will meet or exceed the minimum requirements mentioned here
- For Tier 1, all unsupervised work related competencies will meet or exceed the minimum requirements mentioned here

What can be expected from a DP SME at each skill level:

Level	Proof Points
Knowledge	• Able to interpret and evaluate information and advice from experts in an area of expertise. • Able to use the correct terminology (vocabulary) of the area of expertise. • Able to hold an informed debate with experts in the area of expertise. • Able to ask questions that test the viability of proposals in an area of expertise. • Able to carry out some of the activities with help.
Skill	• Able to perform consistently and satisfactorily the majority of activities of an area of expertise. • Able to translate guidelines and standards for the area of expertise into practical actions. • Able to solve imaginatively, common technical/operational problems in the area of expertise. • Able to guide and advise others in technical/operational aspects of the areas of expertise.
Mastery	• Troubleshoot / adapt / evaluate alternate and / or novel solutions objectively. • Be able to diagnose and resolve significant complex, non-routine problems in the area of expertise. • Able to creatively solve significant, complex, non-routine problems in the area of expertise. • Able to adapt practices from other markets or countries for use in the area of expertise. • Able to generate substantial improvements to local practices and procedures for the areas of expertise. • Demonstrate experience in applying technical and operational expertise to achieve business objectives safely and predictably. • The ability to objectively evaluate proposals (including alternate solutions) or offer alternative solutions and risk mitigations to resolve DP-related issues.

DP FMEA Practitioner Expectations

- The MTS Techop introduces the mastery level in addition to those in MDAT
- The CAF needs to be retuned to suit the new skill levels mentioned here
- Each tier level needs to remapped
- Tier 2 will meet or exceed the minimum requirements mentioned here
- For Tier 1, all unsupervised work related competencies will meet or exceed the minimum requirements mentioned here

What can be expected from a DP FMEA Practitioner at each skill level:

Level	Proof Points
Aware	• Able to recognize the relative importance of an item or concept. • Be able to find further information in guidance and standards. • Be able to recognize when it is necessary to seek assistance.
Knowledge	• Able to interpret and evaluate information and advice from experts in an area of expertise. • Able to use the correct terminology (vocabulary) of the subject. • Able to hold an informed debate with subject matter experts. • Able to ask questions that test the viability of technical explanations and solutions. • Able to carry out some of the activities with help.
Skill	• Able to perform the majority of activities required for DP system FMEA in a consistent and satisfactory manner. • Able to translate guidelines and standards for DP system FMEAs into practical actions. • Able to solve imaginatively, common technical/operational problems in the area DP system redundancy and fault tolerance. • Able to guide and advise others in technical/operational aspects of DP System FMEA and related mission critical equipment.
Mastery	• Evaluate alternate and / or novel solutions objectively. • Be able to diagnose and resolve significant complex, non-routine problems in the area of DP system design and related mission critical equipment. • Able to creatively solve significant, complex, non-routine problems. • Able to adapt practices from other engineering disciplines for use in DP system verification. • Able to generate substantial improvements to local practices and procedures for DP system design and analysis. • Demonstrate experience in applying technical and operational expertise to the evaluation of DP system design and analysis. • The ability to objectively evaluate proposals (including alternate solutions) or offer alternative solutions and risk mitigations to resolve DP-related issues.

Skill Levels Assessment

The Skill level assessment needs to be tuned to the new guidance in the CAF

This includes additional assessment tables as included in the Appendix B of the Techop (PDDP2)

Training materials also need to include the recommended items as mentioned in the PDDP2. This includes both self learning and “coaching and mentoring” items

MASTERY - A candidate with mastery in the subject competency will speak fluently and be able articulate all the main concepts associated with a particular subject without prompting or recourse to asking follow-on questions. (that is to say they will mention many of the issues which are the subject of the follow-on questions). The candidate will demonstrate that they understand all or most of the issues at a **conceptual, philosophical and practical level** – Mastery may be awarded on the basis of such a performance alone but further confidence in the appropriateness of the categorization may be gained from the answers to follow on questions.

SKILLED - A candidate who is skilled in the subject competence is likely to demonstrate a **sound understanding of the practical issues in the main question** but may be less able to articulate the philosophical and conceptual issues in the main question and may need to be prompted to expand their answer to allow their understanding of the conceptual and theoretical issues to be assessed. The score awarded to such a candidate is likely to be influenced by their performance in the follow-on questions.

KNOWLEDGEABLE – A candidate who is knowledgeable in a particular competence may give a **fairly limited response in reply to the main questions** but will be able to demonstrate the scope of their knowledge by correctly answering most of the follow-on questions in a manner that gives confidence they understand the practical important of the issues raised by the questions.

AWARE – A candidate who is only aware of issues within the subject competence is **likely to need significant prompting and use of follow-on questions** to gain an understanding of their knowledge. Their answers may be at a superficial level. They may struggle to answer the main question. They may not be able to answer all the follow-on questions.

NOT AWARE – A candidate who is not aware will likely ask for the main question to be repeated in a different way or be expanded or may state they have no knowledge of a particular subject.

NOTE – FAILURE TO ACHIEVE MASTERY – When it becomes clear during the oral exam that a candidate is not going to achieve Mastery in the four competencies required to be a DP SME, the examiners should use the follow-on question to help develop a study plan to assist the candidate in achieving the required competencies at the next opportunity.

All good things must come to an end!

“It is good to have an end to journey toward; but it is the journey that matters, in the end.”

— Ursula K. Le Guin, The Left Hand of Darkness

Conclusion

- A final CAF document has been created based on the new guidance documents. It is live in its current state.
- The DP SME path has been aligned with DP Surveyor and the FMEA Practitioner path has been aligned with DP Consultant
- Each tier requirement has been mapped as Aware / Knowledgeable / Skilled / Mastery as per guidance
- New assessment and training programs are in the process of being developed
- All DP Personnel in Europe and Africa have begun their journey and are making progress (due to the guidance)
- The target for Europe / Africa to arrive at their destination is end 2018. World domination will follow soon

Questions?