Remote / Rolling DP Trials

- The new approach to annual DP trials
- Methods of maintaining safety & standards
- Increased crew DP awareness & training
- The real alternative to ‘attended’ trials

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IMCA M190, June 2011 states:

*'**Annual DP trials may be conducted** as a single, separate event, or **as part of a rolling test programme over the year, possibly as part of the vessel's planned maintenance programme**. The industry norm is for the trials to be carried out as a single, separate event. Where the trials are held on this basis, owners should ensure that they are witnessed by a third party. This could be an independent third party or any competent person separate from the relevant operational team, such as the master or chief engineer of another vessel, or an appropriate shore-based technical specialist. **Where the trials are part of a rolling test programme over the year, the owner should ensure that the trials and the results are subject to independent scrutiny and approval**'*

- The airline industry has practised remote testing & diagnostics for many years
- DP control system remote diagnostics are well established within the industry
- Drill Ships & MODU's are already utilising rolling DP trials
- The concept of rolling DP testing for PSV's & AHTS has been available for many years
- It has been identified that a high percentage of DP incidents are due to lack of crew training.
- A 12 month pilot scheme was run with 3 participating vessels, and in conjunction / consultation with a major IACS member Classification society
- The pilot scheme was a success & the scheme was rolled out to the market in late 2015
- Presently 48 vessels from 5 offshore owner / operators are enrolled

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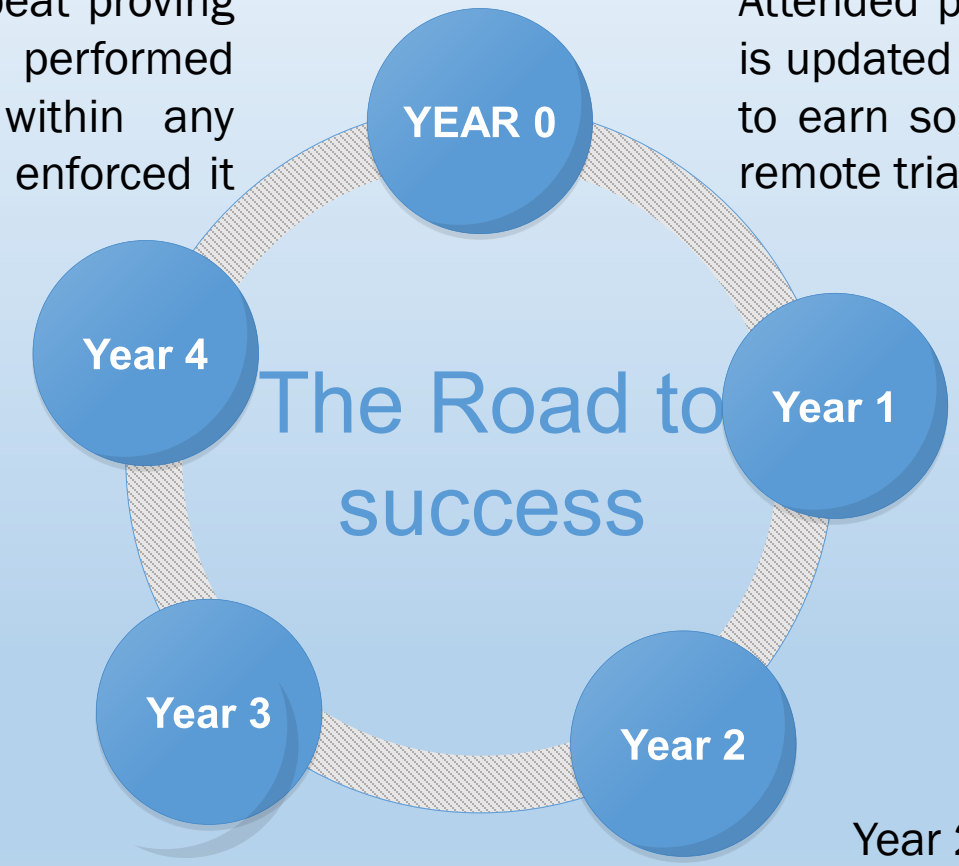
The 5 year cycle.
(A vessel can enroll at any point in the cycle)

The 5 year review & attended repeat proving trials are not permitted to be performed remotely. This is NOT stated within any guidance, but we have adopted & enforced it as our 'Safety Net'.



Attended proving trials are conducted, the FMEA is updated post-trials. The vessel goes off to work to earn some income for the owners. First year remote trials are commenced.

Year 1: The first year testing has been completed, running exactly the same tests as would have been run for attended trials. The report is issued, together with any findings, and the vessel rolls into year 2 remotes, running the tests exactly as defined under IMCA guidance.

Year 2. As for end of year 1, the vessel rolls into year 3 remotes

Year 3: As for end of year 1, the vessel rolls into year 4 remotes

Year 4: As for end of year 1, the vessel rolls into year 5 remotes.

Following the full attended 5 yearly trials, the vessel resumes remote testing as for year 0, and the cycle repeats itself.

HOW IT WORKS

Attended trials:

- 3rd party prepares the trials schedule
- Vessel crew perform the tests, wire breaks etc
- **3rd party records the results in a short time span**
- 3rd party produces the report & the findings
- The vessel crew closes out the findings, and repeats the test following close-out, and reports to the 3rd party.

Remote trials:

- 3rd party prepares the trials schedule
- Vessel crew perform the tests, wire breaks etc
- **Vessel crew record & evidence the results with as much time as they need.**
- 3rd party produces the report & the findings
- The vessel crew closes out the findings, and repeats the test following close-out, and reports to the 3rd party.

- It is therefore quite clear that remote testing is already accepted when closing out findings from the 'attended' trials
- The only difference between 'remote' and 'attended' trials is the single step highlighted in red, so we will examine that in more detail later

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Love them or hate them

Remote / Rolling DP trials really do work
They are the future, and here's why

Increased crew awareness.
Increased safety
Early warning of potential faults
The crews ability to find & fix faults more quickly & confidently
Hard documented evidence of actual test results
Lowered cost for ship owners / operators
Lowered workload for office based managers & superintendents

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The role of the 3rd party scrutineer

This role is crucial to the success & validity of remote testing, and is the area clients, charterers and the industry should focus under DP assurance or quality audit.

The scrutiny process we have developed is in 3 phases. Every received test result passes through these 3 stages before the report is issued:

Phase 1. Initial review. Is the test sheet correctly completed with date, witness & results? Is there sufficient supporting evidence?

Phase 2. Each month completed test results are scrutinised in depth by an experienced in-house DP consultant. Concerns or queries are raised & documented. The report is updated with all tests completed to date, with any concerns or queries raised.

Phase 3. Prior to issue of the report, all tests are again examined, findings formalised & categorised as per IMCA guidance (A, B, or C)

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Reporting, Findings

The below are taken from a recent remote trials report, for a real vessel on completion of year 1 trials

Look familiar?

2.3 B – FOR ACTION WHEN REASONABLY CONVENIENT

There are 8 findings in this category.

No.	Finding	Status	DP Marine Comment
B1	Ref tests 7, 8 & 14. The FMEA & proving trials only mention a single Cyscan, however it was noted in these trials that the DP can accept dual Cyscan as individual references. If a single Cyscan target is in use, only one cyscan should be selected as a position reference	Closed 03.01.17	On DP the Cyscan is labeled as Cyscan-1 and the Radascan is Cyscan-2. But they are actually 2 different reference system using different targets (they cannot use the same targets).
B2	Test 18, DP controllers. From the evidence provided it would appear that wind 1, & VRS 1 were lost upon failure of one power supply (At 15:27:01 DP OS 1 time). This was not as expected. Both DGPS's were selected at the time and both remained in service, as did all 3 gyro's.	CLOSED 20.11.16 Trials methodology updated for future use.	Suggest test be repeated in 2017 schedule – methodology to be improved by DP Marine to clearly show evidence required ('Redundant stations' drop down menu to be visible)
B3	Ref test 20, IJS & other tests Initially it appeared as if Gyro 3 (Satellite compass) had failed during this test, but examination of other test results showed that Gyro 3 was in alarm a great deal, indicating that there is either a problem with gyro 3, or the interface between it & the DP	Closed 03.01.17	IJS documented by pictorial evidence as being fully operational. Gyro 3 (Satellite compass) reported as being operational, there are now no repetitive gyro 3 alarms
B4	Test 28 CPP control loops. Steps 4 & 5 were not tested at proving trials or subsequent annual trials due to missing RR schematics.	Closed 07.01.17	Correct terminals identified, tests repeated with satisfactory results. Methodology to be amended for future trials
B5	Test 29, rudder control loops As for previous point, steps 1 & 2 were not tested at proving trials, nor during these trials due to missing information / drawings from RR. Also there was no prediction error generated for the stbd at step 4.	Closed 07.01.17	Correct terminals identified, tests repeated with satisfactory results. Methodology to be amended for future trials
B6	Ref test 30, blackout tests Some of the results shown on the alarm print do not appear to be in line with what was as expected, for example Both CPP's were lost within a minute of each other (11:11:58 stbd & 11:13:18 port). This is emphasised by the immediate 'Insufficient thrust' alarm at 11:13:27 indicating that possibly both CPP's were lost to DP. Both stern thrusters were lost within a very short time frame (T3 at 10:52:44, and T4 at 10:56). Later alarms, commencing at 11:36 would appear to be more in line with the results expected during this test, but reporting needs to be clear as to start time and status at start of test.	Closed 07.01.17	The tests have been repeated by the vessel crew, with all results as were expected. It would appear that the alarm prints & other evidence provided for scrutiny during rolling trials were historical, and not pertinent to the test being performed.
B7	Ref test 33, FO systems Steps 1 & 2 of this test could not be performed due to the air pressure reducing valve being broken.	OPEN	Test should be repeated once the valve is repaired
B8	Ref test 34, Thruster full power tests. T3 (Stern tunnel 1) tripped after 8.5 minutes, all other thrusters remained in operation for full 15 mins at full power.	Closed 03.01.17	Test repeated & evidence provided to verify that the thruster was able to run at 100% for full 15 minutes

There are 4 findings in this category.

No.	Finding	Status	DP Marine Comment
C1	Test 7 was originally entitled 'RADius" but the vessel is not fitted with RADius. This test, in line with the alarms generated, has been changed to read 'Cyscan'	FOR INFO	Future trials will be amended accordingly
C2	Ref test 10, Heading control. 2 of the screen shots provided as evidence indicate a degree of position instability (3.1m with gyro 1 selected alone) & 3.3m with gyro 2 selected alone.)	OPEN	Suggest running the test again, as it appears from the evidence that a vessel move was also in progress during the heading stability test?
C3	Test 16, DP UPS's. Failing power supply to the UPS also generated a VRS alarm, which was not as expected	OPEN	The VRS alarm is normally associated with UPS F1 failure (DP controller)
C4	Tests 23 to 27 inclusive The vessel tested all 4 thrusters under one test as per proving trials test 30, rather than as individual tests as is more normal under annual trials testing regimes. The evidence provided indicates that results were as expected, there being 15 screen dumps provided, one for each step. The above methodology is as per proving trials but future test methods should be amended by DP Marine to include all control loops DP to/from TCC, and TCC to/from thruster	CLOSED	The evidence provided indicates that results were as expected, there being 15 screen dumps provided, one for each step. This methodology is as per proving trials but future test methods should be amended by DP Marine to include all control loops DP to/from TCC, and TCC to/from thruster Test methodology amended for future trials

That red text

On slide 4 it was shown that with the exception of one step, remote trials & attended trials are essentially the same.
The only difference being:
For attended trials the 3rd party surveyor notes the results;
during remote trials the vessel crew record the results.

We need to look into this in more depth

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Attended trials:
The 3rd party surveyor is often working under a great deal of time pressure. He can only be in one place at a time, so must rely on the vessel crew to assist in recording alarms, vessel behaviour, thruster activity etc. IMCA M190 clearly shows this to be the case (M190 section A.1.5 page 43 states '*The vessels staff will assist as required in recording alarms & failures locally. Locally means not only at the DP console but also at the ECR, thruster room etc*'). He can only see what is presented to him by way of evidence of results obtained. He cannot possibly record & document what happened at each step of each test. There is no hard evidence of what actaully happened during the test excepting the words 'as expected' or 'not as expected'

So 'attended' trials already rely heavily on the vessel crew with reporting of results. It says so.

Remote trials:
The bridge is manned, the ECR is manned, the electrician and/or Chief Engineer are performing the testing. On performing the test, the bridge & ECR take screen dumps, photographs and take copies of the alarm print-out. They enter on the test sheet what happened. Not what they think happened, or what someone else thinks happened, but what actually happened. They are not permitted to make assumptions, add heresay or do anything other than to report. The test sheet, together with all of the screen dumps, photo's and alarm printouts are sent to the 3rd party scrutineer, who will examine the test, check the results & the evidence provided in support, against the expected results. The scrutineer is not under time pressure, he is back in the office with a cup of coffee and has the time to check 'actual results' against 'expected results'. Thoroughly.
All evidence is securely stored & backed up for future reference.

Which method is more thorough. More diligent. Safer. Cheaper?

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Progress reporting during the year

At the end of each month, each client & their enrolled vessels receive an update showing the following.

- Tests completed
- Tests remaining
- Due date for completion
- Overall percentage towards completion
- Any high priority or critical findings uncovered from returned test sheets

This creates:

- Internal fleet competitiveness between enrolled company vessels. (The ‘We are better than them’ syndrome)
- The opportunity to reward high performing vessels without critisising the slower ones (The pat on the back is better than the kick in the pants)
- A real sense of achievement & pride in their vessel & their work.
- Less workload for shore based vessel managers & superintendents.
- Much more capable crew who openly question & scrutinise their FMEA’s, trials & other DP related documentation. Not because they have to. But because they want to.
- A crew who are vastly more DP familiar, DP confident and who are able to much more quickly & confidently find & fix any DP related problem on board. Not only making the vessel safer, but also able to return it to full working order in short order, minimising vessel downtime whilst waiting for shore side techicians to respond & assist.

Everything we use, both at work at at home has evolved from its initial concept idea.

Dodo’s are not with us any longer
Our TV’s are in colour
Bluetooth, wireless, stereo
All are evolving continuously

Everything has to evolve to survive.

Remote DP trials are the next evolutionary process within our industry

They are now tried & tested
They are a real alternative
They are safer
They are cheaper

Thank you for your attention

Looking forward to the Q&A

I think……

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