CONFIGURATION MANAGEMENT 'BEST PRACTICE'

BY

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ABSTRACT

The requirement to improve all aspects of Configuration Management within Major Warships Integrated Project Team has been realised for some time. Issues that are included in the Configuration Management umbrella include initial integration and design aspects of a project, development of this design, production of guidance information and drawings, drawings of actual embodiment of equipment, record of ship equipment baseline and a record of equipment modification states. Although often regarded as trivial, failure to implement these measures is fundamental to the majority of equipment problems and lack of availability of systems. This ultimately leads to an increase in the cost of supporting the equipment throughout its lifecycle.

Problem

There are several recent examples of where the lack of configuration has led to an unnecessary waste of time and money. A Batch 3 Type 42 Destroyer reported an OPDEF on her Radar 1022. Ship's staff could not rectify the problem and after several hours of contractor support the fault was still present. Three months worth of spares were used to assist in the faultfinding before an un-embodied modification kit was found in the back of the cabinet. After an investigation it was discovered this was actually a safety modification and therefore increasing the seriousness of the situation and the potential for damage to the system or injury to the users. This is just one example but the same situation was encountered on a CVS's LFB system, where the CU card was modified and then reverted back to a previous mod state without record. Another example was the entire rollout of GPS equipment across the Fleet and the Joint Tactical Information Distribution System on another Type 42. The latter was an example of the lack of accurate drawings of the latest equipment embodiment.

FIG.1 – INVINCIBLE CLASS CVS

The Configuration subject will be looked at in three individual areas but in the long run they will all complement each other. The three areas are Initial Design and Integration, Production of System Drawings and the Recording of Equipment Modification States.

Initial Design and Integration

This area looks at integrating a piece of equipment into a larger system of systems. The complexity of the Combat System is so great that any abnormality as a result of the introduction of the new piece of equipment could impact adversely on the whole system performance. The recent trend of thought pattern from Equipment IPTs is that if the equipment can be installed quickly and inexpensively, there will then be a large pot of funding left over to solve any resulting integration problems. This point of view is particularly common amongst Equipment IPTs from the Communications area and IPTs who do not have experience of maritime systems. It was in fact this very reason why Defence Standard 21-88, 'Policies and Procedures for Combat System Integration in Surface Ships,' was written. It was as a direct result of the problems experienced of the first Combat System Highway, which was implemented on HMS MANCHESTER in 1993. This Standard is mandatory for equipments that are required to integrate onto the Combat System Highway or have a dedicated interface to the Command System. Despite this fact, equipment IPTs have managed to by-pass important parts of these procedures and fitted equipment before the Platform IPT has sufficient

knowledge of the inbound system. Defence Standard 21-88 is extremely comprehensive and has been written and updated with the assistance of vast Combat System Engineering experience. Compliance with the process detailed in this standard would ensure that mistakes made in the past were not repeated and Combat System Engineers, who possess intricate system knowledge, are used in the design stages of an equipment project and not retrospectively when the equipment does not integrate to the Combat System.

FIG.2 – HMS MANCHESTER – TYPE 42 DESTROYER

The process in the Defence Standard was not being followed very well by Equipment Project Managers (EPMs). Therefore there was a need to provide a secretariat service to act as a vehicle for Project Teams to follow the correct procedure for procuring equipment. An agency already existed to provide the secretariat side of the process in accordance with the Defence Standard. SiCA, System Information and Co-ordinating Agency are a service currently provided by BMT Defence Services Limited. It is funded by the Technical Enabling Services under contract MSCN-0084 and the current contract is until 2009. As well as managing interface and link documentation, SiCA provide a secretariat aspect of a Change Impact Assessment Process (CIAP) before the introduction of new or upgraded equipment. This performs the basis of the Def Stan 21-88 process and gives the Equipment Project Manager some direction as to which issues to address and the next actions that are required to be taken. The SiCA Process was initially trialled on three pilot projects, which were WECDIS, UAT CUP and ASAR. In December 2004 a comprehensive review meeting for the SiCA Process was held. The review included all stakeholders including representatives from Major Warships IPT Combat System Engineers (CSE), Frigates IPT CSE, Submarines IPT, EPMs from the pilot projects, and experts on policy from the Fleet Data Management Group. It was generally agreed that this process was very worthwhile and provided an excellent guide for an EPM and would solve

integration problems that were being experienced with current projects. Important factors of the process were identified including when and how to start the process off to optimise its effectiveness.

At the FLEET WEMIT meeting a solution was sought to overcome the problem of new communication equipment causing Mutual Interference after it was installed on platforms. The SiCA Process was suggested as a possible solution, as it had been previously discussed that sufficient data on ships communications equipment interface information was held on the SiCA database. FLEET and DCSA took this idea on board and it was an agenda item for the second SiCA Process review meeting. At this forum it was agreed that the process should begin as a result of the Capability Working Group System Assessment meeting at the DEC. Platform IPT Requirements Managers will be key to relaying the information back to the Platform IPT Combat System Engineers. The Change Impact Assessment would take place before Main Gate. This way an approximate measure of the costs will be fed into the Main Gate decision. These predicted costs are those supplied by all effected parties. An Interface Working Group was introduced where stakeholders have the rare opportunity to ask questions on technical issues they may have from the distributed Change Impact Assessment forms and the System Technical Overview. At this meeting the deadline will be set for all Change Impact Assessments. It was agreed that the process should and can cater for the integration of Communication equipment. Although they may not always physically interface to the Command System or Combat System Highway, the Combat System by definition is the 'fighting capability of the ship' and communication systems are vital to this. Combat System Configuration Management Committee (CSCMC) meetings will be held thereafter at the discretion of the CSE Configuration Manager. These meetings will be the forum at which projects will be granted permission to proceed to Development and Embodiment respectively by satisfying set criteria. A further CIAP may then be carried out when the contract is won and a design solution is proposed, giving stakeholders a chance to carryout a more in depth Change Impact Assessment.

The original SSF22 and SSF22A forms were often incorrectly completed, partly due to their length and complexity. After several editorial meetings a new and enhanced form was produced to target the key issues effecting integration. The final document provided EPMs with a list of key issues to consider when assessing whether their equipment would be affected by the new or upgraded one. The list was collated by looking at recent projects, which had encountered problems with integration. In theory if these issues are looked at an early stage in the project lifecycle, using the experienced engineers that are available to projects, then effective integration solutions can be incorporated into the design, saving time and money attempting to rectify problems when the manufactured equipment is on the platform. This form provides an EPM, no matter how experienced or otherwise, with a structured guide to carrying out an assessment and guaranteeing that renowned problem areas are not overlooked. It has been endorsed by the surface and sub-surface communities and therefore provides a universal solution and narrowing the gap between how submarines and surface ships do their business. Two key decisions with the revised process are that training establishments and the DCSA, including Defence Spectrum Management, are included on the distribution of the Change Impact Assessment as well as the Fleet Data Managers team. This is a pre-cursor to possible consultation from effected EPMs or Platform Installation Managers who also carryout an assessment.

Since the issue of the new SiCA Process and its documentation, further projects are being procured using the process. These include ADAWS Ed 3.1, ADAWS Ed 4 IACS (cancelled since), DNA2, Precision Approach Radar, Echosounder 800, W-AIS, Radar 1007 Mk 14 transponder, DII (Afloat) and Medium Range Radar. All projects from now on, which may affect the Combat System, will be introduced using the SiCA Process. The mandatory use of the process was raised at the Combat System Managers Steering Group in November 05 and material to be displayed on the Acquisition Management System was put forward to DLogMP at the time, Commodore Ian Jess for endorsement. This page now exists on the AMS under Acquisition Topics and Combat System Integration (Maritime). The information also provides links to all related documents including Def Stan 21-88 Issue 2. The process is also used as an example of a method of Change Management of the Principles of Configuration Management course delivered by Defence Procurement Management Training.

One area of uncertainty is where this process would be accommodated. Although it has been proven as an effective way of complying with Def Stan 21-88 and provides Combat System Engineers with some official control over system integration, the same process is used by Submarines and therefore inclusion in Def Stan 21-88 was not sufficient. It is therefore believed that the process should form a Maritime Acquisition Publication, which would detail it as a Business Process. Def Stan 21-88 Issue 2 now refers to MAP 02-003 'The Combat System Change Impact Assessment Process'. It is called this to avoid any contractual issues of SiCA, being a BMT DSL Agency. This would allow Submarines to refer to it from their own standard and avoid the process being misaligned if included in separate documents. This solution would also cover the obsolescence of SSP 38 Chapters 4.14 and 4.15, which both detail Change Management. MAPs will be held within DLogME but will come under the management of the Naval Technical Publications Policy Group (NTPPC). It has been confirmed that MAPS can be introduced and mandated in contracts, which is contrary to initial beliefs. The process is not exclusive to BMT Defence Services Limited and should they lose the contract at the next renewal the MAP would still represent the required policy. However it should be said their subject knowledge and management of documentation is second to none in the industry.

In summary the SiCA CIAP Process now provides an effective method of integration into the Combat System of all Naval Platforms. It will also provide a feed into the Combat System Integration Committee (CSIC) meetings for Combat System Equipment and Communication equipment. As the process develops, all Interface Documentation and Guidance Information that is produced will be managed Under Ministry Control by SiCA. This ensures Configuration Management of these documents creating a legacy for future equipments to refer to. Problems with current equipments have started by interfaces having to be designed from scratch, as the existing interface documents could not be found. The process does not create any extra work for the Equipment IPTs, so there is everything to gain in the pursuit of successful integration. It is hereby recommended that the SiCA Process be used for the introduction of all Combat System Equipment and Communications Equipment at the discretion of the Platform IPT. As stated above, detailed information is displayed on the AMS under Acquisition Topics and Combat System Integration (Maritime).

Production and Management of System Drawings

A great deal of uncertainty surrounds the production of system drawings and where they are stored. Despite the Design Support Alliance contract, some Equipment IPTs still contract directly for installation of the equipment. An example of this is BD&T being contracted by Lockheed Martin for the installation of the WECDIS system. The example of the JTIDS problem is an example of what happens when the correct drawings are not consulted. Another example is in the design stages of WECDIS when the Interface Specifications for the SNAPS system were required as a reference for the new WECDIS to Navigation Aids Interface Specifications. These could not be found and so the interface solutions were designed from the beginning and lessons were not learned from the original SNAPS interfaces. This has delayed the WECDIS programme substantially and also taken funding which could have been used more efficiently.

The confusion stems from the different places that documentation can be held. SiCA have been managing Interface Specifications for Submarines and MCMV IPT for several years and these are available on the SiCA Homepage on the RLI. It was requested by Major Warships and Frigates IPTs that *their* Interface Specifications should also be stored on this database. Doubts were raised that because the majority of the installations are through the DSA contract, there would be Commercial Property Rights associated with the drawings produced. However this does not affect the MCMV IPT that is also included under the DSA Contract.

Attention was then drawn to the DSA Vault. A Collaborative Working Environment where Level 2, Level 3 and Level 4 guidance is displayed. On inspection the drawings selected appeared to be up to date. This included the WECDIS drawings despite the system's installation not being part of the DSA Contract. Also because of the lack of information or visible process as to how actual implementation is recorded and displayed on the DSA Vault, confidence in the information displayed cannot be guaranteed. There is also potential for a repeat in the WECDIS situation where relevant information could be stored in a variety of applications, but the person seeking drawings are unaware of where to look. It has since been realised that, in most cases, only the users of the DSA Vault are aware of its availability. Therefore to raise global visibility and confidence in the procedures performed under the DSA Contract and by the MWIPT the following actions are recommended:

1. An audit should be carried out on the DSA Process from the Guidance Information present on installation to the drawings of the implemented fitting. There was a need to find out how this actually happens and then how the information is displayed on the DSA Vault. A tasking was raised by MWIPT QA and sent to the DQA to audit the processes of the DSA Contract and the initial QAR visits have taken place, witnessed by a representative from the Combat System Design Authority. It was also necessary to ascertain how the Mature Design Solutions, that are developed, are validated for accuracy and issues such as EMC and Tempest requirements by MWIPT. This is to avoid taking huge risk and consequential cost on to the MoD. All recommendations as a result of the audit are being taken forward by DLogMP to form an integral part of the UPKEEP and FTSP Process Reviews that are currently being undertaken.

2. Interface Specifications should either appear on the SiCA Database or at least be referenced on the SiCA Database. Guidance Information should be displayed on the DSA Vault. In the past if the installation was not through the DSA Contract, the Interface Specifications and Mature Design Solutions may escape visibility of the Platform IPT and the equipment could be fitted without knowledge. Whereas now, at CSCMCs, Platform CSEs will demand to see these documents if they are through the DSA Contract, or otherwise. Visibility of all equipment installations is therefore guaranteed for the Platform IPT. Also this early engagement with the Platform IPT will guarantee the EIPT has all the required information available to them. It must also be stated that the performance and configuration control implemented by the DSA appears very efficient but with a process so large and complex, with several key players that there are inevitable gaps and it is necessary to iron out such anomalies.

3. All installations should be through the Design Support Alliance. Several equipment projects are contracting the installation of their systems individually. This is extremely undesirable because EIPTs usually contract members of the Design Support Alliance to perform the installation but not through the Design Support Alliance contract. This effectively means the company get paid twice for the same role. The other disadvantage is that the separate cell of the Alliance company requests the phase one design solution from the platform SWSE, but instead of producing the Mature Design Solution in consultation with the other alliance members, the MDS is producing in isolation and therefore excludes trends and lessons learned from similar installations from the alliance members who have experience of the platforms and the platform SWSE. The Urgent Operational Requirement, Automatic Identification System, which was carried out independent to the DSA contract, was planned without consulting the master drawings in the datum pack. The installation consisted of a survey, carried out by the company performing the fit, and then the production of MDS without the DSA members or the MWIPT having any visibility of the design intent. The fit took place and only when a member of ships staff raised concern that a new piece of equipment had appeared, in a dangerous position, was it realised that the whole process had been completed in isolation.

   It was since understood that non-DSA Contract installations rarely, if ever, are forwarded for inclusion in the ship Datum pack whether it be V-Bridge or PIE (Product Information Explorer.)

   This disadvantage is compounded by the fact that funding has been cut to several platforms' datum pack maintenance. The Type 42 Batch 2 datum packs have not been funded since 1999 and have thousands of non-implemented change notes. The implication of this is the platform lifetime is increasing and the ship drawings are therefore completely out of date and are becoming more so as the time in service increases. So to assist the production of new installation designs, drawings are requested from the datum packs that are missing all equipments fitted in the last 7 years. Therefore there is no longer an accurate representation of any platform. This approach to installation also often bypasses the Platform IPT who should approve the Design Solution at each stage. An example of where this has occurred is with the WECDIS fit on one of the MWIPT Amphibious Platforms. The platform IPT was present at the survey but did not have visibility of the drawings again

until the MDS was presented. The MDS did not reflect any of the recommendations based on safety and platform operational requirements and the company demanded extra funding to correct the design. This would have been avoided firstly if the installation was carried out through the DSA and secondly if the Platform IPT was consulted at each stage of the MDS production.

This can be avoided in future by including all relevant Defence Standards in the contract, especially Def Stan 21-88, and Def Stan 59-411, and also by the use of the DSA for installations to Major Warship platforms made mandatory.

If these recommendations are implemented the problem of Interface Specifications, Guidance Information and Implementation Drawings not being available should be eliminated.

Recording of Equipment Modification States

In an attempt to ascertain the current methods of configuration employed by IPTs regarding equipment modifications, a survey was carried out across various Equipment IPTs. The intention was to extract methods of best practise from these IPTs in order to construct a robust and effective form of configuration control. The IPTs visited were Abovewater Weapon Systems IPT, Underwater Systems IPT, Major Warships IPT ADAWS section, Submarine Support IPT, Ships Missiles Systems IPT (now MGMS IPT) and Puma/Gazelle IPT. The main areas of interest were how the requirement to demand the modification was conveyed to the required platforms, how the platform acknowledged receipt of the modification kit, how embodiment of the modification was confirmed and how this was recorded by the IPT. It was also unknown how the removal of a modification was recorded if carried out during fault diagnosis. The important information for a Platform IPT to have visibility of is what modification kits have been received by which platforms and if the kits have been fitted or embodied to the equipment. The Submarine Support IPT and Puma/Gazelle IPTs were included as they have a reputation for tight configuration control due to the greater safety implications of equipment error.

Software issues from the Software Issuing Office are recorded on the SIO-R online database. This is available on the MCTA intranet page. The only downside to this is that although the SIO confirm with the CSDA that the software can be distributed, there is currently no mechanism to confirm when the software has been successfully installed.

Each IPT had their own individual configuration process. Excluding SUB IPT and Puma/Gazelle IPTs, the method employed to inform ships to demand modification kits varied from MoD FICHE to Signal with the mod kit then being demanded from Naval Stores. Also Defect Acquaint forms could induce a modification to a system. This did not include some equipment modification kits that went straight to the platform from the contractor. These modifications seem to slip through the configuration process. The modifications were accompanied by a Mod Leaflet and occasionally MoD Form 2012 which was believed to be a method of receipt acknowledgement. There was also reference to a Mod Certificate (Form 3077) although the use of this was not known. In accordance with BR 1313 the embodiment of modifications is sometimes recorded in the equipment BR

onboard, although with some equipments this was not the case. The mod strike method is used with the number of the mod 'struck out' on the equipment tick chart. This does not record which modification corresponds to which mod strike and therefore does not provide a robust method of configuration, as the associated mod leaflets are not always retained. The main themes from the EIPTs was that there was no consistent method of recording distribution to ships and no robust method of confirming receipt and embodiment. Some equipments had onboard logs but this was not always the case and some modifications were carried out directly from the contractor without visibility of the Equipment or Platform IPT. There was also no visibility to the IPT if modifications were removed for fault diagnosis. Another evident problem is that there are several different forms that appear to overlap in their functionality and use of these forms differs from one IPT to another.

The Submarine Support and Puma Gazelle IPTs, as Platform IPTs, differ in that they use Class Mods and record modifications in a central database. Class mods provide a method of prioritising the modification depending on its importance. As an example a modification to increase safety would become the highest priority and the equipment should not be used until the modification is embodied and the embodiment confirmed. These IPTs have the advantage of having several posts in place to look after configuration of their equipment including their Combat System equipment. Submarine Support IPT complies with SSCP 38 and the Puma/Gazelle IPT with Defence Standard 05-123 and JAP 100A-01. Both IPTs' platforms have equipment Logbooks to record all modifications. These are compared to the databases at regular intervals to ensure they align correctly. For the Puma/Gazelle IPT, the platforms send a record of completed modifications on a four monthly basis to the Platform IPT. This is supported by meetings with the Design Authority every four months to compare modifications and 6 monthly meetings with the French contractor who share the contract with Westlands. Neither Platform IPT processes implemented Class Modifications for software upgrades. SUB IPT do not receive confirmation of modification embodiment in real time, they only receive a list of the embodied modifications on a six monthly basis. Although this includes all modifications

Despite the lack of installation confirmation, the SIO-R system provides adequate configuration control of software held on Surface Ships. In addition to this the MWIPT CSE team maintain a spreadsheet which details the software or firmware baselines that each platform's equipment should be operating at any time. This is displayed on the following RLI link: hhtp://www.wsa.dlo.r.mil.uk/DLogMP/LBTS/MWIMPT/. The Equipment Software Register can be viewed by each platform to confirm they ate at the correct baseline and can be used by the CSE team, in conjunction with the SIO-R database to see where ships have been sent the software and not installed it.

The Major Warships IPT requires a similar control mechanism to accurately record modifications to equipment. The Surface Ship Definition Database (SSDD), managed by DLogMP, provides a central database with inputs at every main Dockyard and MoD base, as well as other databases such as CRISP, UMMS and the DSA Vault. It has recently become web enabled and so provides visibility to all required personnel. The SSDD was previously used to record modifications, using feedback from MoD Form 2012 but due to the lack of returns the data was cleansed from the database. The database is maintained by VT Group, with the

maintenance team based in Portchester, Hampshire. The server has recently moved to HMNB Portsmouth. Personnel are in place to manage the input of data and much funding has been used to set up this facility, therefore it would provide the central database utilised effectively by the SUB and Puma/Gazelle IPTs. The SSDD provides a 'tree sequence' of equipment fits per platform. The outfit is broken down into component parts including Addition or Alteration (A&A) information, PECs and LRUs. The database is capable of storing Hardware, Software and Firmware states, providing a comprehensive record of equipment modification states on each platform.

Information stored on such a database is only as reliable as the feedback received from the platforms. Therefore an effective and robust feedback mechanism is required. The current MoD Form 2012 failed and so an online and relatively quick and easy form is favourable. As the SSDD is managed by DlogMP, the feedback can be returned by ships staff or by the contractor as members of the Design Support Alliance have always had access to input data to the SSDD. This would prevent contractors fitting modifications without the knowledge of the Platform IPT. The existence of onboard Equipment Logs would re-enforce this and also provide a source to confirm and validate the data in the SSDD.

A major factor in the implementation of this plan is the feedback mechanism which would effectively 'close the loop' on the modification process. An initial idea was to include a mandatory field in UMMS, which ships' staff must fill out to feedback the information and close the modification. This is not currently possible as not all platforms have access to UMMS and the operation is not yet technically possible. This may remain an option for the future however. The MGMS IPT has recently trialled a new method of configuration control for Radar 996, using a modified MoD Form 731. This Electronic Return Form (ERF) returned on embodiment of the mod, details the new mod state of the equipment and all the required information to keep and accurate equipment record right down to Line Replaceable Unit level. The advantage with this initiative is it was jointly designed with the equipment manufacturer so this will guarantee its use, at least on this equipment. Another advantage is that this online form saves the time and effort required for returning paper forms. There is an obvious requirement to streamline the documents in use. Different forms are used in different IPTs and some exist but seem to be unused with little knowledge of their purpose or significance. This will inevitably involve the gradual aligning and editing of associated BRs, SSPs and Defence Standards, including Def Stan 02-41 and SSP 38. The modified MoD Form 731, ERF, appears to be working extremely efficiently and was presented to all stakeholders in the SSDD initiative, at the SSDD Mods Working Groups, of which there have been four to date. Members of this forum will include representatives from Major Warships IPT, Frigates IPT, MCMV IPT, Type 45 IPT, MGMS IPT, FWS IPT, NEW IPT, DLogMP, DLogME and VT Group. Type 45 IPT are still unsure how their final in-service support function will be performed but are interested in this idea in an attempt to shape their strategy work in parallel with the current surface fleet. CVF Project has also expressed a desire to be kept informed of outputs from the Working Groups in order to assess methods of recording equipment modifications.

FIG.3 – DARING CLASS TYPE 45 DESTROYER

The SSDD has the potential to display equipment information to the complete surface fleet and therefore improve/initiate compliance with Defence Standard 02-41, which determines Requirements for Configuration Management and Ship Fit Definitions. Currently the equipment modification states lies solely with the Equipment IPT and there is no guarantee that this is accurate. This initiative was recognised in the DLogMP/DLogME annual BiLat as a potential solution to a long-standing problem, which is the source of much wasted time and funding.

It is therefore recommended that Major Warships IPT lead with this idea throughout the successful project initialisation stage. This has already involved using the Radar 996 and ADAWS equipment as pilot projects and assessing the effectiveness of the SSDD to record modifications to the system. The current ADAWS baseline is not known on every platform. Therefore the ADAWS Project plan to carry out maintenance audits across the Major Warship Platforms. This will provide a known baseline, which can be built on in the SSDD. The MGMS IPT has successfully trialled the ERF, with the modifications data forwarded to VT Group to populate the relevant fields in the database. This project has a better idea of the equipment baseline due to the work they have been carrying out recently. In order to progress the initiative, VT Group gave a presentation of the plan to the MWIPT CSICs to demonstrate the advantage of maintaining configuration control in this way. As a result we have now added UAT Mod1, Radar 1007 and Radar 1022 to the list of equipments involved. It is necessary to increase the equipments involved gradually. This is because to record modifications to LRU level, the equipment first has to be baselined and if all EIPTs forwarded their baseline data

for each ship with that equipment, VT Group would be overwhelmed with data requiring inputting. Therefore if a few are introduced at a time the baselines can be accurately represented on the database. Once the data is up to date, the baseline can be built upon by return of the ERFs will be much more manageable as they will be one modification at a time. Onboard Logs should be maintained for all equipment. It is often believed that is too time consuming but in contrary to that believe this will provide validation for the SSDD and also ease the process of Maintenance Audits to determine the modification state and determine an equipment baseline. This will assist in any required fault diagnosis, saving time and money in the long term by employing good engineering practice.

A future topic of discussion at the SSDD Working Group is whether a form of Classification, in terms of priority, is implemented on all mods. This will identify if the modification is for the purposes of safety and hence will prevent the equipment being used until it is implemented, avoiding the Type 42 Radar 1022 situation mentioned in the 'Problem' section of this report. It was also suggested that each modification should be associated with a unique identification code. The SSDD already applies a code to each modification and this may suffice, but will also be discussed at the Working Group. The SSDD us now the main source of all ship fit data, supplying data to other prominent databases including UMMS. An attractive feature of the SSDD is the ability to produce automatic reports to the EIPTs documenting the state of their equipment on each platform. The content and format of these reports is being shaped by the preferences of the Working Group, in which we have a wide scope of representatives.

Following the successful trial period using these pilot projects, it is recommended that DlogMP manage this function from their central location, covering all Surface platforms. They also manage the Design Support Alliance contract, therefore assuring compliance by all Contractors who form the Alliance should they be carrying out the modification. It is intended that this initiative follow the same path as the SiCA Process, where a few equipments are used as iterative pilot projects to iron out any problems or required adjustments. When the process has reached a state of maturity and appears to be operating effectively, it will be ready to include as part of the SSP 38 replacement document, which is likely to be in the form of a Maritime Acquisition Publication and is sponsored by DLogME. One requirement of the EIPTs involved has been for commonality for all the platforms their equipment is fitted on. This has led to beginning to increase the scope of the SSDD to shore trialling and training establishments.

To conclude, the processes and resources required to counter this long-standing and significant deficiency, that is Configuration Control, are all extant and available. It is necessary to use these more efficiently in order to maximise their effectiveness. The way the modifications are initiated by the Equipment IPTs is not necessarily a problem but the Platform IPT needs to know when and where the modification kits are distributed and when they are received and embodied. By forming a Working Group and developing the use of the SSDD it should be possible to provide this visibility without excessive increase in cost and manpower. Future benefits of successful implementation of this plan will be a saving in contractor time investigating equipment faults, and the resulting costs involved. Opportunity cost of not improving the way the surface fleet work and incorporating others' **Best Practice**, will be the failure to learn from our mistakes and continue suffering the embarrassing and costly situations we currently face.