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THE DEFENCE LOGISTICS SUPPORT CHAIN MANUAL

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INVENTORY MANAGEMENT

PART 316
SUPPLY MANAGEMENT PROCEDURES FOR AERO-ENGINES AND MODULES

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Contents:

CHAPTER 1: SUPPLY MANAGEMENT PROCEDURES FOR AERO-ENGINES AND MODULES

PURPOSE

1. The purpose of this leaflet is to outline the supply management procedures for aero-engines and modules. It also contains instructions about accounting arrangements, and the methods and techniques employed to make sure that an appropriate level of serviceable reserves of aero-engines and modules are maintained.

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INTRODUCTION

3. The RAF is the joint-Service manager for all aero-engines and modules used in fixed-wing aircraft. The RN exercises the same function for helicopter aero-engines. The RAF is responsible for the provision of accessories and their spares for both types of engine. The RAF has a considerable capital investment in aero-engines and also makes an annual multi-million pound commitment for their repair and overhaul. The total quantity of aero-engines and modules purchased includes those reserves necessary to allow for the movement of aero-engines and modules between the depot, units and Repair and Overhaul (R&O) facilities and for the turn-round times associated with R&O. Any delays in the handling, despatch and receipt processing of aero-engines, modules or repairable spares. The extension of R&O and transit times will also adversely affect the availability of serviceable reserves. A sound supply management structure working to defined responsibilities and functions is necessary to ensure that optimum value is obtained from the RAF's considerable investment in aero-engines and modules.

PRINCIPLES

4. The management of aero-engines comprises 4 basic elements:

a. The forecasting of activity from which initial provisioning calculations are derived and R&O requirements are determined.

b. The arrangement of R&O capacity.

c. The management of R&O by matching the available capacity with the actual activity encountered in day-to-day operations, and monitoring output.

d. The day-to-day management and allotment of serviceable reserves between user units to ensure the most efficient utilisation of resources.

5. In recent years, various factors have combined to modify the application of the management principles. Changes have arisen primarily as a result of the development of the modular or semi-modular engine, the introduction of computer-based mathematical modelling techniques, and the necessary disciplines arising from the considerable increases in costs. The use of mathematical models which can be readily updated in the light of pre-production and in-Service operations has resulted in more detailed and accurate forecasts of the total engine and module requirements for initial purchase or overhaul programme purposes.

6. The total number of engines and modules to be purchased as reserves is dependent on the policy adopted for their R&O at all depths of maintenance. Other factors may impact on the quantification of the reserve purchase, but many of these must be treated as adjuncts of the overall servicing policy. In particular, the need to develop an independent in-service overhaul capability for certain engines, the advent of modularity, and the high cost of engines, modules, servicing equipment and test facilities has resulted in the need for complex servicing policies which can exploit all the available resources within the Services and Industry in the most cost-effective manner.

MANAGEMENT OF R&O

7. Following the introduction of a fixed wing aero-engine into Service, responsibility for the availability of serviceable reserves of aero-engines from overhaul of all 3 Services falls to the Support Authority staffs of SMG. The RN exercises a similar function for helicopter aero -engines for all three Services through the DHSA.

8. DDSM 6(RAF) is responsible for the sponsorship and requisitioning of the R&O of all fixed-wing aircraft aero-engines. Specifically, DDSM 6(RAF) undertakes:

a. The management of the supply control and overhaul of fixed-wing aircraft aero-engines and modules in industry and in-Service (at all depths of maintenance) for all three Services.

b. The provisioning of spares in support of industrial and in-Service repair and overhaul for aero-engines and modules used in fixed-wing aircraft.

c. The assessment of the overhaul requirements of aero-engines and modules for the RAF using, as a basis, data concerning the predicted performance of the engines and modules. In arriving at these assessments, DDSM 6(RAF) makes use of analytical and simulation mathematical modelling techniques.

9. DDSM 6(RAF) is also responsible for stating and obtaining agreement to the future overhaul requirements for fixed-wing aircraft aero-engines using the following procedures:

a. Estimating the arisings of repairable aero-engines from the RAF using AE patterns, rates of effort, estimated or calculated reconditioning lives of each type and mark of engine or module, and other pertinent data. This information will invariably form the input to the analytical or simulation mathematical model used for the particular type of engine.

b. Obtaining from the RN and Army staffs their estimates of the 5 years forward repair requirements for the fixed-wing aero-engines operated by the two Services, together with a monthly schedule of requirements for the forthcoming year.

c. Co-ordinating all Service requirements, and presenting these at the annual aero-engine and module Overhaul Requirements Meetings with industrial contractors and HQLC.

d. Using the co-ordinated assessments, negotiating with contractors' and HQLC staffs, and agreeing output programmes for the future.

10. **Helicopter Aero-Engines.** The management of helicopter aero-engines is carried out by the Defence Helicopter Support Authority (DHSA) at Yeovilton. DDSM 6(RAF) retains some aspects of helicopter engine accessory management.

SUPPLY AERO-ENGINE RECORD OFFICE

11. The Supply Aero-Engine Record Office (SARO) is a dedicated computer system, located within SM 27(RAF) at SMG, RAF Wyton. The basic principle of the SARO computer system is that all aero-engine and module events are reported by all concerned (units, the depot and contractors) to SARO by signal or telex messages or via BAEMMA/MAEMIS. The contents of these messages (which are also copied to the Maintenance Data Centre) and the reporting procedures employed are detailed in AP 100E-02. On receipt at the SMG, the information contained in the event message is input to the SARO computer system, and all appropriate records, for example, the individual aero-engine or module serial number file, the provisioning file, the location file, etc, are automatically updated. The implications of the event are then analysed and any management action required is initiated.

12. The facilities of the SARO computer system allow the engine manager to call up any information he may require before deciding on his course of action. SARO provides comprehensive data on matters such as stocks and their locations, assets, liabilities etc., and thus allows the accurate monitoring of aero-engine and module dispositions. This, in turn permits the timely identification of repair or overhaul 'queues' and allows the engine manager to adjust the disposition of repairable arisings to minimise their effect.

13. Decisions made by the engine managers are input to the SARO computer system which then initiates any further action required for example, the automatic drafting of an allotment instruction, updates the appropriate files and sets markers for any necessary progression action. Throughout the entire process, data is automatically extracted to historical files which may then be used as the source of base data for computer mathematical modelling and other planning purposes

TERMINOLOGY

14. **Aero-Engine.** The term 'aero-engine' includes references to bare engines, engine change units, engine coupling gearboxes, power plants, and airborne and ground running auxiliary power plants.

15. **Modular Aero-Engine.** A wholly modular aero-engine is one which consists of a number of major assemblies (modules) which have been designed to facilitate engine repair and overhaul. This type of construction facilitates rapid strip, rebuild and exchange of either individual modules or a number of modules.

16. **Partially Modular Aero-Engine.** A partially modular aero-engine consists of modules, accessories and a residual carcass. The carcass is the term used for that part of the aero-engine remaining after all modules and accessories have been removed.

17. **Module.** A module is a major assembly which is treated as an independent entity, is fully interchangeable without previous matching, and is readily replaceable, physically and functionally, with no more than minor adjustments. A module can be easily detached from, and re-attached to, other modules using the type of equipment and degree of skill normally available at unit level.

18. **Aero-Engine Inventory.** The inventory of aero-engines and modules consists of the following elements:

a. Installed in aircraft.

b. Held as Serviceable, but not installed in aircraft.

c. Held as Repairable, but awaiting repair, overhaul or defect investigation.

d. Held as Repairable, but undergoing repair, overhaul or defect investigation.

e. Serviceable or Repairable, but in transit between units, or units and overhaul facilities.

19. Instructional aero-engines and modules are not included in the total aero-engine inventory; Paragraphs 75 to 83 detail the special regulations applicable to this category of aero-engine.

20. **Aero-Engine Events.** An aero-engine event is any one of the following reportable incidents in the life of an aero-engine:

a. Rejection or removal from an airframe.

b. Installation into an airframe.

c. Receipt at, despatch or disposal from a unit or repair facility. (NB: the receipt, despatch or disposal of aero-engines installed in aircraft, are reportable aero-engine events).

d. Change of condition. (For example from serviceable to repairable).

21. **Module Event.** A module event is any one of the following reportable incidents in the life of an aero-engine module:

a. Rejection or removal from a modular aero-engine.

b. Installation in a modular aero-engine.

c. Receipt at, despatch or disposal from a unit or repair facility. (NB: the receipt, despatch or disposal of modules installed in an aero-engine and/or an aircraft are reportable module events).

d. Change of condition.

22. **'Serviceable Not-in-Use' Aero-Engines and Modules.** Aero-engines and modules which are new, re-conditioned or have been repaired or overhauled, other than at unit level, are to be considered as 'serviceable not-in-use' from the time of receipt at a unit until all ground running and air testing necessary to confirm satisfactory performance has been completed.

23. **Aero-Engine and Module Categorisation.** Whenever an aero-engine or module is rejected from an airframe or modular aero-engine, or whenever a 'serviceable not in-use' aero-engine or module is found to be damaged or defective, it is to be categorised as repairable, with the categorisation being supplemented by one of the following specific reasons:

a. **LIFEX.** Aero-engines and modules which have reached the end of their authorised life are to be categorised as 'repairable LIFEX'.

b. **INV.** Aero-engines and modules rejected from use prior to life-expiry which are offered for possible defect investigation by a quality assurance authority are to be categorised 'repairable INV'.

c. **RS.** Aero-engines and modules rejected from use prior to life expiry which require depth A or B maintenance that is within the user's capability are to be categorised 'repairable RS'.

d. **RC.** Aero-engines and modules rejected from use prior to life expiry which require depth B or C maintenance that is beyond the user's capability, thus necessitating transfer to a Depth C maintenance facility at the same or another station are to be categorised 'repairable RC'.

e. **RD.** Aero-engines and modules rejected from use prior to life expiry which require transfer to a Depth D maintenance facility are to be categorised 'repairable RD'.

24. **Overhaul.** Overhaul is the generic term covering rectification, repair or reconditioning of an aero-engine or module.

25. **Repair.** Repair is the recovery, for example, restoration to a serviceable state, of an aero-engine or module which will allow it to complete its authorised life before further reconditioning.

26. **Reconditioning.** Reconditioning is the recovery of an aero-engine or module to the extent that it may be re-issued for use with a full authorised life.

AUTHORITIES

27. **Support Authorities.** The Engineering Authorities have been absorbed into the two Support Authorities at DDSM 6(RAF) and DHSA. The responsibilities for the aero-engine types are as follows:

a. **DHSA.** Astazou IIIN2&XV1D, Gnomes, Lycoming T55, Solar APU, Turmo IIIC4, Garrett 331, Allison 250 B17C/C20B, Gem and Pratt & Witney R985.

b. **DDSM 6(RAF).** Pegasus, RB199, Adour, Allison T56, Artouste, Avon, Conway, Garrett P36 APU, CFM56, Lycoming ALF 502, RB211, Spey, Garrett 331, Gypsy Major, Lycoming 10-360, Viper and Garrett 731.

28. **Allotment Authorities.** Aero-engines and modules are allotable items of equipment, that is, they can only be moved or transferred between units on receipt of instructions from specified authorities. The DHSA will allot all helicopter aero-engines and modules. DDSM 6(RAF) will allot all fixed wing aircraft aero-engines and modules.

MANAGER / CUSTOMER SERVICE CONCEPT AND ARRANGEMENTS

29. Since the RN is responsible for rotary-wing aero engines and modules, and the RAF for those for fixed-wing aircraft, a 'Manager Service' and 'Customer Service' arrangement has been developed to discharge responsibilities for the control of the aero-engine overhaul task. Details are as follows:

a. The RN sponsors the overhaul of all rotary-wing aero-engines and modules either in industry or in the Naval Aircraft Repair Organisation (NARO). In this context, the RN is the 'Manager Service' and the Army and RAF are 'Customer Services'. As the Manager Service, the RN stores on behalf of all three Services the reserves of rotary wing aero-engines and modules which are not directly deployed in support of operational or reserve helicopters.

b. The RAF sponsors and tasks the overhaul of all fixed-wing aero-engines and modules either in industry, at RAF Command overhaul bases, or at approved unit level depths of maintenance. In this case, the RAF is the 'Manager Service' and the RN and Army are 'Customer Services'.

c. As the Manager Service, the RAF stores on behalf of all three Services the reserves of fixed-wing aircraft aero-engines and modules.

PROCEDURES

30. When an aero-engine or module is transferred between units, or units and repair facilities, the following details are to be quoted on the vouchers raised to cover the transaction:

a. The type, mark and suffix (if any) of the aero-engine or module.

b. The manufacturer's serial number allocated to the aero-engine or module. (NB: aero-engines, but not necessarily modules, carry the Manufacturer's Serial Number consisting of up to 6 digits. This number is to be quoted on the covering vouchers).

c. The allotment authority and allotment number.

31. When a power plant is transferred between units, or units and repair facilities, the following details are to be quoted on the vouchers raised to cover the transaction:

a. The type, mark and assembly number of the power plant.

b. The type, mark, and suffix (if any) of the installed aero-engine.

c. The manufacturer's serial number.

d. The allotment authority and allotment number.

32. The vouchers covering transfers between units, or units and repair facilities, are also to be appropriately annotated: 'Complete to *engine/engine change unit/engine coupling

gearbox/power plant/module/airborne-ground running auxiliary power plant checking list, issue number ..... (*delete as necessary)'. If there is a discrepancy of a Class P or L store, or checking list item, the voucher is to be so endorsed. Aero-engines or modules packed in water vapour resistant (WVR) bags are to be treated as packaged equipment both for issues between units and for issues out of, or receipts into, the RAF. The receipt check of such an engine, engine change unit, power plant or module is only to be carried out when it is necessary to open the WVR bag for the first time, for example, to prepare the unit for use, to modify it, or to replace the desiccant. Further checks are not required should it later be found necessary to re-open the WVR bag for any other purpose at the same unit.

33. **Power Plants.** The following instructions apply specifically to power plants:

a. **Interchangeability.** The interchangeability of power plants is indicated by the assembly number. When a power plant is issued it bears an identification plate carrying its assembly number; a corresponding plate upon which is stamped the assembly number of the power plant to be fitted, is fixed to each aircraft engine nacelle. A schedule of power plant assemblies, specifying the make of the aero-engine, the items which affect the interchangeability of the assembly, the type of aircraft, and the position in that aircraft at which a particular power plant can be installed is published in the Volume 2 of the appropriate power plant Air Publication.

b. **Conversion.** When an Equipment Supply Depot is unable to issue a power plant of the required assembly number in sufficient time, the consignee unit is to be asked to confirm that they are able to deal with the task of converting any available power plant to the required assembly number. If confirmation is forthcoming, the necessary conversion set is to be issued with the power plant, the consignee unit is to effect the conversion, and any items remaining surplus after the task are to be disposed of in accordance with current instructions.

ISSUES OF AERO-ENGINES AND MODULES

34. **Issues within the RAF.** The procedure for issues of aero-engines or modules between RAF units is detailed in Leaflet UG 7/2. When preparing the documentation to cover such issues the provisos of Paragraphs 28-31 above are to be taken into account.

35. **Issues out of the RAF.** Aero-engines and modules, other than those installed in aircraft, are not to be issued out of the RAF except on the authority of an allotment instruction from DHSA or DDSM 6(RAF) as appropriate. The accounting procedures for these issues are detailed in Leaflet UG 7/2 and Paragraphs 28-31 above.

RECEIPTS OF AERO-ENGINES AND MODULES

36. When an uninstalled aero-engine or module is received from a Service unit, or civilian production or overhaul facility it is to be brought on charge using the procedures detailed in Leaflet UG 7/4.

37. **Deficiencies.** If an aero-engine or module is received at an RAF unit deficient of any Class P or L store, a label detailing the deficiency is to be prepared (cross-referred to the receipt voucher covering the transaction) and attached to the aero-engine or module. Replacement components are to be obtained in the normal manner, except that demands and vouchers are to be cross-referred to the original receipt voucher. Similarly, should it be necessary to 'rob' an uninstalled aero-engine or module or a Class P or L store, the

replacement demands and vouchers are to be cross-referred to that against which the item was removed.

38. **Faulty Aero-Engines and Modules.** If an installed aero-engine is found to be faulty on receipt of an aircraft from a contractor or Maintenance Unit, the procedure in AP 3158 Volume 2 Leaflet E2 is to be followed. If an uninstalled aero-engine or module is found to be faulty on receipt from a contractor or Maintenance Unit, the procedures in Leaflet UT 7/1 and in AP 100B-01 are to be followed. In either instance, should special investigation of the defective aero-engine or module be required, allotment instructions will be issued by the appropriate authority.

INTERNAL ACCOUNTING FOR AERO-ENGINES AND MODULES

39. The internal accounting procedures for aero-engines and modules are contained in the UG 1 and UT 2/1, and in Paragraphs 28 to 31 above.

AERO-ENGINES FOUND DEFECTIVE-IN-USE

40. The procedure for reporting aero-engines and modules found to be defective when in use is detailed in AP 100E-02.

LOSS, DAMAGE OR DETERIORATION

41. The procedures to be followed for the write-off or strike-off of aero-engines or modules which are lost, damaged, or subject to deterioration is detailed in Leaflet UG 1/2.

DISPOSAL OF REPAIRABLE AERO-ENGINES AND MODULES

42. When an aero-engine is categorised as repairable an allotment instruction will be issued by the appropriate authority. These instructions will specify the disposal of the aero-engine or module.

43. Normally, allotment instructions will be issued within the following period of time:

a. **To Call-Forward for Defect Investigation.** When an aero-engine or module is categorised 'repairable INV', and it is decided that a defect investigation will be carried out, the appropriate DG(A)(PE) engine specialist will notify that decision to the appropriate authority within seven working days so that the required allotment instruction can be issued. If it is decided that defect investigation action is not necessary, allotment instructions will be issued by the appropriate authority within 8 days of the aero-engine or module being categorised.

b. **To Call-Forward for Repair or Reconditioning.** When an aero-engine or module is categorised 'repairable LIFEX' or 'repairable RC or RD', allotment instructions will be issued by the appropriate authority within four (4) working days of notification of the change of state.

44. **Record Cards.** For those aero-engines and modules being despatched from a unit for defect investigation or overhaul, Engineering Record Cards (ERC) are to be actioned as detailed in Leaflet C7/1. Additionally, a tie-on label, giving the under mentioned information, is to be prepared and attached to the aero engine or module.

a. The number of hours run since new or the last recondition.

b. A brief note of the reason for categorisation of the aero-engine or module as repairable; e.g. 'LIFEX', MOD Form 760A or 760B action, 'FOD', etc. The terms 'for repair' and 'for reconditioning' are not to be used.

c. Whether any assemblies have been stripped from the aero-engine or module for examination and have been only loosely re-assembled; an indication of the parts of the assembly concerned is also to be provided.

If for any reason the ERC cannot be forwarded with the aero-engine or module, it is to be sent to the consignee by registered post and the consignee is to be advised, by signal or telex message, that this course of action has been taken. Additionally, in these circumstances a signed and dated certificate of engine preservation, prepared in accordance with the instructions contained in AP 4471A Volume 1 Part 1 Section 2 Chapter 1, is also to be attached to the aero-engine or module.

45. **Despatch.** Unless specifically exempted by the allotment authority, RAF units are to despatch aero-engines and modules to the nominated consignee within 8 working days of receipt of the allotment instruction.

46. **Disposal of Aero-Engine as Scrap Metal.** When the allotment instruction calls for an aero-engine or module to be disposed of as scrap, it will also - if necessary - specify those parts which are to be mutilated to prevent their possible unauthorised recovery. Leaflet C 3/7 refers.

REPORTING PROCEDURES

47. The efficient control and management or aero-engines and module reserves depends on the reporting procedures detailed in AP 100E-02 being meticulously followed; all removals, rejections, changes in condition, receipts and despatches of aero-engines and modules must be reported correctly and within the required time-scale. Unit Engineering and Supply staffs are to maintain a constant liaison to ensure that all the requirements of AP 100E-02 are met in the most effective manner.

SMB PROCEDURES

48. **Application.** The details in Paragraphs 47 to 49 apply to the management of aero-engines for fixed-wing aircraft for which the RAF is the Manager Service. The same principles are followed, although the details may vary, in the management of helicopter engines for which the RN is the Manager Service.

49. **Provisioning.** The procedure for provisioning aero-engines and aero-engine modules are in Leaflet MG 7/2.

50. **R & O Arrangements.** The R&O arrangements are as follows:

a. **Forecast of Arisings.** Annually DDSM 6(RAF) will convene a series of Assumption Meetings attended by representatives from the Support Authority and the Product Support staff of the appropriate overhaul contractor. The purpose of this meeting is to agree the input data for the mathematical models used to forecast repair and overhaul arisings over the next five (5) years. At the sixth (6^{th}) month point, an in-house review will be held by DDSM 6(RAF) to monitor the model result accuracy in relation to reality.

b. **Calculation of Requirements.** DDSM 6(RAF) will calculate the overhaul requirements for all aero-engine and module types over the next 5 years taking account of floor stock at the overhaul centres and the arisings forecast. Details of the task are to be agreed with the overhaul centres.

c. **Overhaul Requirements Meetings.** DDSM 6(RAF) will convene a series of Overhaul Requirements Meetings (Pre-ORMs) in March each year. These meetings are to permit full discussion of the overhaul requirements between representatives of DDSM 6(RAF) and the industrial overhaul centres. When RAF 3rd Line work is involved AMM are to attend. The purpose of these meetings is to allow the contractor/HQLC to make formal offers of overhaul output against the Service's requirements. Once the offers have been accepted the Minutes of the meetings are published as the official overhaul programmes for the next five (5) years.

51. **Monitoring of R & O.** DDSM 6(RAF) will monitor the R & O overhaul output from the work centres and, should any fail to meet the agreed programmes, will raise the problem with the overhaul centre. The reasons for any production backlog will be investigated and arisings and critical spares will be re-allocated to maximise output where it is appropriate to do so.

TRANSPORTATION AND SERVICING EQUIPMENT

52. The control of Transportation and Servicing Equipment is vested in DDSM6 and DGSA. Transportation and Servicing Equipment for the RB 199 is the responsibility of SM 23(RAF).

53. The term 'aero-engine' includes bare engines, engine change units, power plants, engine modules (including coupling gearboxes), auxiliary airborne power plants (AAFPs) and all Palouste engines (for both air and ground use).

54. The range of equipment concerned consists of:

a. Major Items in Man Codes 40B and 540B (controlled by DDSM6 (RAF)). These Man Codes contain transportation/servicing stands, cases and WVR bags for the storage, transportation and servicing of aero-engines. They are at present recorded on the DSDC Stafford Depot Computer.

b. Spares in Man Code 40BA to Support the Repair of Major Items (controlled by DDSM6 (RAF). These Man Codes contain the spares required for the repair and maintenance of the major items mentioned in sub-Paragraph 53a. They are included in the inventory of equipment controlled by the Logistics Control Centre (LCC).

INITIAL PROVISIONING

55. **Major Items.** Because of differing parameters the initial provisioning of items required for storage and transportation is carried out separately from initial provisioning of items required for servicing. Where a particular item serves both purposes (e.g. stands) this is taken into consideration. The procedure for initial provisioning is as follows:

a. Storage / Transportation Requirements (Aero-Engine Transportation Stands, Cases, and WVR Bags).

(1) Service requirements are to be evaluated and sponsored by the appropriate Engineering Authority who is to advise the precise details of the

items required, and the date they are to be available, to MOD (PE)Eng 4c. The Engineering Authorities concerned are:

(a) **RN**: MOD Director General of DHSA.

(b) **Army**: MOD Director General of Engineering Mechanical Engineers (Engine Management Executive 9) (DGE ME(EME 9)).

(c) **RAF**: The appropriate MOD / AFD Specialist Support Engineering Branch. For joint Service aircraft projects it is essential that there is close liaison between Engineering Authorities.

(2) MOD(PE) Eng 4c, as design authority for the Services, is to develop the items required and is to grant the design approval.

(3) Subsequent to receipt of design approval, will calculate combined Army and RAF requirements. Because of the unusual aircraft deployments, requirements for the RN are to be calculated by DHSA notified to DDSM6 (RAF), and copied to SM(Fin S)(RAF).

(4) Requisitions to cover the total requirement will be raised by DDSM6(RAF), and forwarded to SM(FinS)(RAF) for approval, and onward transmission to MOD(PE) Eng 4c.

(5) On receipt of the approved requisition from SM(Fin S)(RAF), MOD(PE) Eng 4c is to complete its action, and forward requisitions to the appropriate Contracts Branch for contract action.

(6) Progression of deliveries off contract to meet engine build programmes and/or Service requirements will be undertaken by DDSM6 (RAF), in conjunction with MOD(PE) Eng 4c.

b. Servicing Requirements - Aero-Engine Servicing Stands.

(1) The Logistics Support Systems (LSS), at the request of the sponsor Engineering Branch, is to evaluate and recommend servicing requirements. Where projects involve the RN, LSS is to liaise with the DHSA Equipment Division (ED) in assessing the requirement.

(2) MOD(PE) Eng 4c is to develop and give design approval to the servicing equipment required by the Services. LSS will be the accepting authority on behalf of the sponsor Engineering Branch.

(3) Subsequent to receipt of full technical approval, the appropriate Engineering Branch is to act as sponsor and submit a recommended scaling to the Air Force Department Service Equipment Committee (AFDSEC). Sponsor branches are:

(a) RN: DHSA.

(b) Army: MOD DGEME EME 9.

(c) RAF: LSS, through MOD(PE) Ac and the appropriate engine EA.

(4) The minutes of the AFDSEC's meetings will be the authority for initiating provisioning action.

(5) The combined RN, Army and RAF requirements of servicing stands will be calculated by from the approved AFDSEC scales.

(6) Requisitions raised by DDSM6(RAF) will be forwarded to SM(Fin S)(RAF), for approval and onward transmission to MOD(PE) ENG 4c.

(7) On receipt of the approved requisitions form SM(Fin S)(RAF), MOD(PE) Eng 4c is to complete its action and forward the requisitions to the appropriate Contracts Branch, for contract action.

(8) Progression of deliveries off contract to meet Service needs will be arranged by DDSM6(RAF) in conjunction with MOD(PE) Eng 4c.

c. **Delays in Granting Full Technical Approval.** In the event of full technical approval being delayed it may be necessary for DDSM6(RAF) and DHSA to calculate initial requirements and forward requisitions to MOD(PE) Eng 4c via SM(Fin S)(RAF) prior to full technical approval being given. As initial production contracts for newly introduced equipment are usually placed with the design firm, this action will permit Production and Contract Branches to action the requisition and place a contract. In such cases contracts are to be endorsed to the effect that full production and delivery to the Service is not to be effected until full technical approval has been given to the equipment.

d. **Codification.** DDSM6(RAF) is responsible for applying for NATO codification for new items of Fixed-Wing aero-engine servicing and transportation equipment. DHSA is responsible for applying for NATO codification for new items of Helicopter aero-engine servicing and transportation equipment.

56. **Spares.** The initial provisioning of spares is to be carried out as follows:

a. The Engineering Branch responsible for sponsoring the equipment is to arrange for LSS to be tasked with the compilation of a Range of Spares Schedule recommending the quantity of each spare to be provisioned for each new aero-engine transportation/servicing stand and case approved for Service use. In projects involving RN requirements, LSS is to liaise with DHSA.

b. On receipt of the Range of Spares Schedule, DDSM6(RAF) will initiate codification for uncodified spares and submit requisitions for the quantities recommended by LSS and DHSA to SM(Fin S)(RAF).

c. Requisitions for spares are to be actioned in accordance with sub-Paragraphs 53a(4), (5) and (6) and 53b(6) and (7).

RE-PROVISIONING

57. **Major Items.** The re-provisioning of aero-engine transportation/servicing stands, cases, and WVR bags will only be required as the result of increases to Aircraft Establishments, amendments to AFDSEC scales, or to replace quantities found to be beyond economical repair. In the case of the latter, scrapped items are to be the subject of scrap certificates issued by the Department of Quality Assurance (DQA) Inspectors.

Certificates in respect of RN equipment are to be forwarded through DHSA to DDSM6(RAF) for re-provisioning action.

58. Requisitions are to be actioned in accordance with the instructions contained in sub-Paragraphs 53a(4), (5) and (6) and 53b (6), (7) and (8).

59. **Spares.** All spares in Vocabulary Sections 4OBA and 540BA will be reprovisioned by DDSM6(RAF) under the procedures authorised for items under LCC Stanbridge control.

DEMAND AND SUPPLY CONTROL

60. Service demands for items referenced in Sub-Sections 40B and 540B are to be submitted by signal to DSDC Stafford. The signal format is to be as laid down in JSP 336 Pamphlet 3 will be subject to pre-release control by DDSM6(RAF).

61. **Spares.** Demands for all items referenced in Sub-Section 40BA and 540BA are to be submitted as follows:

a. **RN Establishments.** On-line units direct on to LCC. Off-line units through ES (Air)/SC Embav Yeovilton for input to the LCC.

b. **Army Air Corps (AAC) Units and Establishments.** Through the appropriate Field Workshops for transmission to the LCC.

c. **RAF Units.** Direct on LCC.

d. **Engine Repairs Contractors.** Direct to DDSM6(RAF) for transmission to the LCC.

e. **MOD(PE) R and D Units.** Direct on LCC.

62. Demands for items which are Not in the Vocabulary (NIV) are to be submitted to DDSM6(RAF) for identification.

REPAIRS

63. **Major Items.** Aero-engine transportation/servicing stands, cases and WVR bags which require major repair will normally be held at DSDC Stafford as R/D stock. Major repairs are only to be undertaken when authorised by DDSM6(RAF); these will normally be carried out at DSDC Stafford. In exceptional circumstances it may be necessary for DDSM6(RAF) to arrange for repair at:

a. A Service repair depot, or

b. A Civilian repair contractor's works by normal requisition/contract action.

64. **Minor Repairs.** Minor repairs to aero-engine transportation/servicing stands, cases and WVR bags are to be carried out at Service user units and Service and civilian aero-engine repair establishments, as follows:

a. Service Units.

(1) Units are to carry out minor repairs making use of the spares referenced in Sub-Sections 40BA and 540BA.

(2) Items beyond the repair capacity of Army and RAF units are to be reported to DDSM6(RAF), and copied to DSDC Stafford. Arrangements will be made by DDSM6(RAF) for the return of the item to DSDC Stafford or for local disposal.

(3) Items beyond the repair capacity of RN establishments are to be reported to DDSM6(RAF) and repeated to the Engine Holding Unit (EHU) NARO Fleetlands and DSDC Stafford. DDSM6(RAF) will then issue instructions for the return of the item to Fleetlands or 16 MU, or for local disposal action.

b. Service Repair Establishments.

(1) The level of repair at these establishments is to be controlled by the Engineering Manager.

(2) Items which are found to be beyond the Service Repair Establishment's capacity are to be reported to DDSM6(RAF) who will, in turn, issue instructions for the return of the item to DSDC Stafford or for local disposal.

c. Civilian Repair Establishments.

(1) Regulations governing the repair of items at these establishments are contained in the appropriate Civilian Repair Contract. The level of repair is to be controlled by DQA.

(2) Items which are found to be beyond the repair capability of the Civilian Repair Establishment are to be reported to DDSM6(RAF) who will, in turn, instruct the Establishment to return the item to DSDC Stafford, or to dispose of it locally.

STORAGE

65. **Major Items.** Apart from a small pool of major items required to he held at EHU, NARO Fleetlands, to support single Service management of helicopter engines, all transportation / servicing stands, cases and WVR bags not in use, or committed for use, will be held at DSDC Stafford.

66. Service units, and Service and civilian aero-engine repair establishments are to report holdings of items surplus to requirements to DDSM6(RAF) who will issue instructions for disposal.

67. Spares. The stock-holding depot for spares is DSDC Stafford.

68. RN establishments and Army units are to restrict holdings of spares to the minimum consistent with their repair commitments. RAF unit stock levels will be determined by the LCC.

ACCOUNTING

69. Major Items. Aero-engine transportation / servicing stands, cases and WVR bags are not to be accounted for separately when being used for storage. For movement of an aero-engine or when empty (not in use) they are to be fully accounted for as follows:

a. RN: In accordance with BR 96 Chapter 15

b. AAC and RAF Units: In accordance with Leaflet C 9/5.

70. Units are to submit signal reports in the format at Annex A to this leaflet whenever any item of aero-engine transportation / storage equipment is:

a. Brought on charge.

b. Re-categorised from serviceable, R/S and R/D.

c. Struck off charge.

d. Disposed of.

71. Items referenced in Sub-Section 40A and 540BA are to be accounted for in accordance with the relevant procedures laid down for each Service.

PERIODIC RETURNS

72. DSDC Stafford and NARO Fleetlands are to provide DDSM6(RAF) with six-monthly returns, as at 1st March and 1st September each year, giving stock positions and serviceability categories of all aero-engine transportation / servicing stands, cases and WVR bags.

73. Arrangements have been made with MOD(PE) for aero-engine contractors to provide monthly returns showing current holdings / conditions / serviceability of all aero-engine transportation / servicing stands, cases and WVR bags. The return will also include details of requirements for the following three month period.

DISPOSALS

74. **Major Items.** In March and September each year, or on receipt of form 303 (Special Disposal Application) from user units, DDSM6(RAF) will calculate the number of aero-engine transportation/servicing stands, cases and WVR bags required to be retained in use. The following factors will be considered in the calculation:

a. Number of reserve engines.

b. Aircraft Establishment.

c. Stock position of 'not in use' items contained in the latest six-monthly return (see Paragraph 70).

d. Any other known commitments, for example, modification programmes.

75. Items surplus to the RN's requirements will be referred to COMNA and NARO Fleetlands by DDSM6(RAF) for approval to initiate disposal action. DDSM6(RAF) will initiate disposal action for items surplus to Army and RAF requirements.

76. Spares. Requests for disposal instructions for surplus serviceable equipment are to be made in accordance with the instructions in JSP 886 Volume 9.

INSTRUCTIONAL AERO-ENGINES AND MODULES

77. **Transfer To Instructional Category.** When it is agreed that an aero-engine or module is to be used for instructional purposes, an allotment instruction will be issued by DDSM6(RAF) or DHSA which will, allocate an instructional serial number (suffixed in the under mentioned manner) to the item. The original serial number is to be obliterated and the instructional number substituted as soon as the allotment instruction is received.

78. The categories of instructional aero-engine and module are as follows:

a. **Category Suffix 'A' - 'Running'.** Category suffix 'A' aero-engines are capable of being run on the ground, but are not authorised for flying purposes.

b. **Category Suffix 'B' - 'Assembly'.** Category suffix 'B' aero-engines and modules are to be used for training purposes, for example, stripping and re-assembly, in workshops and schools.

c. **Category Suffix 'C' - 'Sectioned'.** Category suffix 'C' aero-engines and modules are those which have been sectioned, with their working parts exposed to view, for instructional purposes.

79. **Requests For Allotment Of Instructional Aero-Engine Modules.** Requests for the allotment-in of instructional aero-engines or modules are to be made by units in the form of a letter to their Command Headquarters (CHQ). The letter is to be accompanied by a statement of the unit's current holdings of instructional aero-engines and modules, and is also to state those items, if any, which could be disposed of if the application is approved.

80. If the request is supported, the CHQ is to forward the application to TGDA PDG 1b, with a copy to DDSM6(RAF), indicating the manner in which the items will be used and the training utilisation rate. If the application is approved, issue action will follow the procedure outlined in Paragraph 76 above.

81. **Accounting.** Aero-engines and modules allotted for ground instructional use are to be converted to the appropriate category by means of a Form 21F, and are to be held on charge as Class P stores separately from other similar items not in the same instructional category. Stock records and Articles-in-Use ledger sheets are to be headed 'Instructional Equipment'.

82. Before a Category 'A' instructional aero-engine is transferred from one unit to another, any parts which may have been removed are to be re-assembled and the engine restored to a safe running condition. If this is not possible, a statement to this effect is to be prepared in duplicate and signed by the OC Engineering Wing of the consignor unit; the original of the statement is to be placed in an envelope marked 'IMPORTANT' and attached to the aero-engine in such a manner that it will be readily visible to the personnel receiving it at the consignee unit. The duplicate copy of the statement is to be attached to the voucher covering the transaction which is forwarded with the aero-engine.

83. The instructions detailed in Leaflet C 20/2 are to be observed whenever an instructional aero-engine or module is transferred between units.

84. **Servicing Records.** The Engineering Record Cards (ERC) for engines which are converted for instructional use (all categories) are to be retained with the Aero Engine

concerned, and are to be endorsed with details of the allotment instruction authorising the conversion.

85. **Reduction in Category.** When an instructional aero-engine or module becomes unsuitable for use in its existing category, and the holding unit recommends its reduction to a lower category, application is to be made to DDSM6(RAF) for permission to reclassify it and for the suffix letter of the serial number to be changed; a copy of the application is to be forwarded to the unit's CHQ. If the reduction in category is approved, DDSM6(RAF) will issue an amending allotment instruction.

86. If an instructional aero-engine or module becomes totally unserviceable and is deemed to be unsuitable for further instructional use, it is to be reported through CHQ to DDSM6(RAF) who will issue disposal instructions.

ANNEX A: AERO-ENGINE TRANSPORTATION AND SERVICING EQUIPMENT STATE SIGNAL

PRECEDENCE: Normally ROUTINE

CLASSIFICATION: Normally UNCLASSIFIED

SIC: OJR

ADDRESSEES:

a. Action SARO Wyton

b. Information 16 MU NARO Fleetlands (in the case of RN items only)

TEXT:

A. Aero-Engine Transportation and Servicing Equipment State Signal.

B. Reason (as applicable):

a. Bring on charge - Following internal receipt (e.g. from Aero-Engine Bay) or. following external receipt.

b. Strike off charge - Following internal issue (e.g. to Aero-Engine Bay) or following external issue.

c. Re-categorised -

From Serv to R/S or R/D or beyond economical repair. DQA Scrap Certificate No.....refers (as applicable).

From R/S to Serv or R/D or beyond economical repair. DQA Scrap Certificate No .....refers (as applicable).

From R/D to Serv or R/S or beyond economical repair. DQA Scrap Certificate No.....refers (as applicable).

C. Engine Type and Mark.

Vocabulary Section and Reference Number of Case (container) being reported:

a.	Quantity	)
		) As Applicable
b.	Condition (i/c Serviceable, Repairable/Station,	)
	Repairable/Depot. Beyond Economic Repair)	)
		)
c.	Current Stock as recorded on Stock Records	)
E.	Vocabulary Section and Reference Number of Stand being reported:	)

		)
a.	Quantity	)
		)
b.	Condition (i.e. Serviceable, Repairable/Station,	)
	Repairable/Depot. Beyond Economic Repair)	)
		)
c.	Current Stock as recorded on Stock Records	)
		) As Applicable
F.	Vocabulary Section and Reference Number of Bag being reported:	)
		)
a	Quantity	)
		)
b.	Condition (i.e. Serviceable, Repairable/Station,	)
	Repairable/Depot. Beyond Economic Repair)	)
		)
c.	Current Stock as recorded on Stock Records	)