

# Flight Safety Investigation Report

Unit Reference No.

IR  
KIN/97/04

4 appropriate boxes

<b>Air</b>	<input type="checkbox"/>	<b>Incident</b>	<input checked="" type="checkbox"/>
<b>Ground</b>	<input checked="" type="checkbox"/>	<b>Accident</b>	<input type="checkbox"/>

Aircraft Details	Type and Mark	Number	Parent Unit	Station
	NIMROD MR2	XV227	RAF Kinloss	RAF Kinloss
Originator Of Report	Rank and Name			Parent Unit
				RAF Kinloss
Pilot Details	Rank and Name			Parent Unit
	N/A			
Accident/ Incident Details	Location		Date/Time	Signal Ref.
	RAF Kinloss		22 Nov 04 2200L	KQJ/K3D 261430Z Nov04

## Contents of Report

- Compulsory** g Factual Account or Copy of Incident Signal
- n Remarks of Appropriate Specialists eg Eng, ATC, Med
- Compulsory** n Remarks of Squadron Commander
- n Remarks of OC Specialist Squadron
- Compulsory** n Remarks of Station/Unit Commander

## Annex

**Accidents only** A Details of Aircraft, Personnel and Damage to Property

**Distribution:** (See JSP551 Vol 1, Appendix 1 to Annex C to Sect 205)

<b>Action:</b> HQSTC - CFSO	<b>Information:</b>	RAF Brize Norton SFSO	<b>Internal:</b>
	MODDASC Bentley Priory	RAF Lyneham SFSO	COS (Ops)
	MODUK DPA Boscombe Down (D/Flying DPA)	RAF Waddington SFSO	OC LSW
	HQ 3 Gp High Wycombe Nimrod Role Office		OC NLS
	DLO ES (Air) Eng Pol AW		OC NSG
	DLO NIMROD IPT		SFSO

**SUPPLEMENTARY COOLING PACK DAMAGE SUSTAINED BY NIMROD MR2 XV227**

References:

- A. Serious Fault Signal H80/H7N 231300ZNOV04.
- B. Ground Incident Report KQJ/K3D 261430ZNOV04.

**INTRODUCTION**

1. On 22 November 2004, Nimrod XV227 was flown on a 42(Reserve) Sqn training sortie. The sortie appeared uneventful and on return to RAF Kinloss the aircraft was seen onto Bay 5 by a Nimrod Line Squadron (NLS) see-in team. When the aircraft had been safely parked, the Aircraft Ground Engineer (AGE) boarded the aircraft and received a verbal debrief from the aircraft Captain that the aircraft was fit for turn round. Four faults were entered in the MOD F700 of which 2 were aircrew accepted. The groundcrew commenced a turn-round servicing whereupon a rupture was discovered in the aircraft Supplementary Conditioning Pack (SCP) duct fairing skin. The rupture was immediately reported to the AGE who then declared the aircraft unserviceable.
2. Aircraft Background. Nimrod XV227 had completed 13,642.50 flying hours on landing back at RAF Kinloss at 2120. The last significant servicing for the aircraft had been a Minor 2 completed on 30 Jul 04 at 13,291 flying hours. The last Major servicing was completed on 26 Sep 00 at 11,241 flying hours.
3. Incident Events. An initial assessment of the damage indicated that the aircraft was repairable by First Line personnel with Second Line assistance. However, as the repair progressed more damage was discovered until a point was reached where the viability of repairing the aircraft within unit resources was in question. It was at this point that a Unit Inquiry was convened.

**NARRATIVE OF EVENTS**

4. Nimrod XV227 had flown a previous sortie on 22 Nov 04 taking off at 0905 and landed at 1325. Several faults were raised in the MOD F700; a mission system recorder fault and 2 radio faults. These faults were aircrew accepted. Three Component Life Register (CLR) codes were also due and extensions to these items were authorized. None of the CLR codes were applicable to the SCP. The aircraft was subjected to a Continuous Charge Servicing in preparation for the next flight. Both the Student and Instructor Air Engineers then met the Air Engineer from the previous sortie at the aircraft and received a verbal debrief. The Student and Instructor Air Engineers believe they were informed that the SCP had given an overheat warning although neither could remember whether it was a Pre-cooler or Tail Pack overheat. However, the off-going air engineer believed the fault to be an overpressure, but due to the time elapsed since the incident he was unsure as to whether this was correct.
5. The Student Air Engineer then carried out his pre-flight checks including a visual inspection of the aircraft during which he noticed nothing unusual. Start-up was normal and as part of the after-start checks the SCP was initiated. The Instructor Air Engineer remembers the SCP initiating correctly as he felt the airflow entering the cabin.
6. Take-off was uneventful and a practice diversion was carried out at Stornoway before proceeding to the task area off Cape Wrath. The sortie was an L14 Anti-submarine Warfare sortie.

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The sortie proceeded uneventfully until mid way through the on-task time when the rear crew asked for additional cooling. The SCP was initiated and the Instructor Air Engineer again recalls airflow entering the cabin.

7. The Student Air Engineer then proceeded to routinely monitor all panel indications and did not recall any abnormal indications. Approximately 20 minutes prior to coming off task the Bomb Bay doors were opened. As the disruption of airflow into the ram air pre-cooler can cause the SCP pre-cooler outlet temperature to rise and on occasions overheat, the Instructor Air Engineer leant over the Student Air Engineer to illustrate this point to him. The pre-cooler outlet temperature was seen to rise but not sufficiently to give a warning indication.

8. Approximately 20 minutes later the task was completed and the aircraft was flown uneventfully back to the point of descent. At this time the Instructor Air Engineer suggested that the SCP could be switched off. The Student Air Engineer is unsure when the SCP was switched off but estimates that it was about 3 hours after initiation.

9. An uneventful landing was carried out at RAF Kinloss and the aircraft taxied back and parked on Bay 5. Nothing unusual was noted by the groundcrew and the AGE boarded the aircraft to receive a debrief from the crew. Nothing of significance was reported and hence the aircraft was to undergo a turn-round servicing prior to the next sortie. One of the groundcrew then reported damage to the starboard side of the aircraft and the AGE went to investigate. On inspecting the damage, the AGE found that part of the aircraft skin had detached and part of the SCP duct was missing. The AGE then instructed the groundcrew to carry out an after flight servicing and he reported to NLS Control that the aircraft was unserviceable. Subsequently, Serious Fault and Ground Incident Signals were raised, References A and B. A review of the aircraft SCP fault history by the Airframe Trade Specialist revealed no previous significant issues.

### **AIRCRAFT RECOVERY ACTION**

10. The SCP damage to Nimrod XV227 has been assessed as Category One. The damage to the starboard spar has not been formally assessed. This damage (Enclosure 1) to XV227 comprised of heat damage to:

- a. The starboard rear spar at the fuselage joint post attachment point.
- b. The starboard mainplane lower skin.
- c. The forward face of No 7 Fuel Tank starboard and leaking FRS couplings due to seal damage.
- d. The SCP duct, duct fairing and associated assemblies.
- e. The aileron output cables and associated pulley.
- f. The flap interconnecting cables.
- g. Various wiring looms adjacent to the failed duct.

**DETERMINATION OF THE CAUSE****INTRODUCTION**

11. **SCP Operation.** The Supplementary Conditioning Pack (SCP) supplements the wing conditioning systems to ensure that adequate cooling is available to the avionic equipment throughout the design temperature range of the aircraft cabin. Like the wing air supply systems (WAS), the SCP uses bleed air from the engines to provide the high-pressure air required for system operation. The air is supplied from the engines via the cross bleed air valves and the cross bleed pipe situated in the bomb bay. From the cross-bleed pipe, the air enters the SCP through the Pressure Regulating and Shut Off Valve (PRSOV) into the pre-cooler section of the system. From here the air is ducted to the Tail Air Conditioning System (Tail Pack). A system diagram is at Enclosure 2.
12. **PRSOV.** The function of the PRSOV is to provide a positive shut-off between the SCP and the engine cross-bleed duct and also to regulate the pressure and hence mass flow entering the pre-cooler. The manufacturers bay check found the PRSOV to be in a fully serviceable condition.
13. **Flow Limiting Venturi.** The flow limiting venturi limits the engine bleed air loss in the event of an air leakage in the pre-cooler system. If there is an air leak from either the pre-cooler itself or any of the associated ducting, then the venturi will choke and limit the flow and hence supply a backpressure to the PRV regulating head preventing the valve from going to the fully open position. If the pressure drop across the venturi reaches 10psi, an under pressure warning light will illuminate on the SCP control panel. Off the same pressure tap as the under pressure switch is an over pressure switch that operates at 65 psi. This will shut the PRSOV and illuminate the over pressure warning light on the SCP control panel.
14. **Pre-cooler.** The function of the pre-cooler is to reduce the temperature of the bleed air to a more workable temperature of 180° C before it passes into the tail pack conditioning system. As the hot air passes through the cooling matrix of the pre-cooler it is cooled by ram air fed from an intake just aft of the bomb bay. A modulation valve controls the amount of ram air allowed to exit the pre-cooler matrix so as to maintain the desired pre-cooler outlet temperature.
  - a. **High Mass Flow Pressure Switch.** This switch energises the cabin mass flow Magnetic Indicator (MI) to read high, if the entry pressure to the pre-cooler exceeds the normal pressure but is not high enough to operate the over pressure switch.
  - b. **Low/Normal Mass Flow Pressure Switch.** This switch indicates normal mass flow on the cabin mass flow MI if the entry pressure to the pre-cooler system is normal. If the pressure is below the design level then it will indicate low mass flow.
  - c. **Pre-cooler Over Pressure Switch.** This switch will shut the system down by de-energising the SOV if the entry pressure exceeds the system design limit. If the switch is activated the over pressure warning light will illuminate on the SCP.
  - d. **Pre-cooler Outlet Temperature Bulb.** This temperature sensor feeds the pre-cooler outlet temperature to the pre-cooler outlet temperature gauge on the SCP control panel.
  - e. **Pre-cooler Overheat Sensor.** This sensor will shut down the system by de-energising the SOV if the pre-cooler temperature exceeds 235°C. If this sensor is activated the pre-cooler over heat light will illuminate on the SCP control panel.

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15. The SCP 65psi overpressure switch and the low mass flow pressure switch were removed from XV227. These items were sent for bay checks and were subsequently deemed to be serviceable although out of limits. The SCP pre-cooler outlet temperature bulb is a “C” class item and cannot be tested. The associated electrical cabling for these items was also checked for continuity and insulation resistance and found to be serviceable.

16. Duct. The component that failed is Bleed Air Duct part no 6M4V10673A. The components normal maximum design pressure and temperature is 66 psi/435°C and it is proof tested to 115psi at a temperature of 15°C. The duct in question was manufactured in 1980 but no records are available to determine the exact date on which it was fitted to XV227. This duct is not subject to any formal inspection at any point in the aircraft’s life including major maintenance.

17. There is no positive evidence to indicate at which point during the sortie that the duct failed. Although the Mission Recorder on XV227 had been reported unserviceable and aircrew accepted from the previous sortie, it was still considered prudent to review the tape for any evidence that may have confirmed event timings. Unfortunately, the tape was completely blank. Given this situation, the following potential failure cases were considered:

- a. Duct failure on initiation during checks after engine start.
- b. Duct failure during initiation in flight.
- c. Duct failure during normal operation in flight.
- d. Duct failure initiated by the failure of the PRSOV.

18. Duct Failure During Initiation. The case for failure during initiation was considered, as this is the moment when the SCP pre-cooler ducting is subjected to the maximum pressure. This is due to the ‘slug’ of high-pressure air entering the system, as the PRV is not in its controlling position due to the lack of backpressure acting on the regulating head.

19. Duct Failure During Initiation as Part of the After Start Checks. Both the air engineers agreed that normal indications were seen during the after start checks. This would not have been possible if the duct had failed at this point as there would have been insufficient air entering the cabin to cause a down swing in the Rate of Cabin Descent Indicator (RCDI), especially when taking into account the low pressure of the bleed air leaving the No 3 engine which would have been at 75% HPRPM.

20. Duct Failure During Initiation in Flight. The air engineer instructor stated that on initiation of the SCP he felt air entering the cabin. The student air engineer stated that all the indications on the SCP control panel were normal during and after initiation. In both instances this would not have been possible if the duct had failed at this point, as very little air would have entered the SCP pre-cooler system and therefore the aircraft fuselage. Subsequently, there would have been no or very little temperature rise on the pre-cooler outlet temperature gauge and the cabin mass flow indicator would have indicated low and not normal as expected.

21. Duct Failure During Normal Operation In Flight. Having considered the possibility of duct failure during initiation, it is recognised that the duct could also have failed under steady running conditions. From the statements given by the air engineer instructor and the student air engineer, it is assumed the SCP initiated normally. The instructor engineer felt the air entering the aircraft fuselage

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and the student engineer stated that the indications on the SCP control panel appeared to be normal. The student air engineer continued to monitor the SCP control panel throughout the rest of the on task time and there were no indications to suggest that anything was abnormal. During the latter stages of the on task period the instructor engineer remembers highlighting to the student air engineer that when the bomb doors were opened, the pre-cooler temperature rises and an overheat can occur due to the pre-cooler ram air intake being masked by the rear bomb doors. On this occasion the SCP did not overheat but the pre-cooler temperature rose above normal. From this evidence it is deduced that the SCP was operating normally up until this point.

22. Assuming that the duct failed after the demonstration, then the most likely effect on the system is that backpressure acting on the PRV regulating head would have fallen and the valve would have moved towards the fully open position. This would have resulted in a very high flow rate of bleed air feeding the duct rupture. The amount of air entering the pre-cooler system would then be very low or non-existent and this would have resulted in the following indications on the SCP control panel.

- a. The pre-cooler temperature would start to fall.
- b. The cabin mass flow MI would indicate low.

23. If the duct failed just after the bomb bay doors demonstration, then the rupture in the ducting would have been fed by unregulated high-pressure air up until the time the SCP was switched off. This period was approximately 40 minutes. During this period, taking into account the climb from the off task point, the temperature and pressure of the bleed air varied between 310°C to 424°C and 120psi to 240psi over the range of 85% HPRPM to 96% HPRPM. These figures were obtained from 2 engines tested on the Rolls Royce test bed. With the PRSOV now tending towards the fully open position, the flow rate from the rupture is difficult to quantify.

24. After considering all the above cases, it was concluded that the duct failed after the point when the Air Engineer Instructor highlighted the usual pre-cooler temperature rise associated with the opening of the bomb bay doors. This is based on the statements provided by the Air Engineers and is the last positive indication that the system was serviceable. Failure of the duct prior to the Bomb Bay doors opening has been discounted as it is considered that the size of the duct's rupture would not allow for sufficient charge air to enter the SCP pre-cooler to operate the system normally. The Student Air Engineer monitored the SCP control panel as part of his routine panel scan and all indications were normal.

25. Starboard Rear Spar Testing. BAES carried out a series of conductivity and hardness measurements of the starboard rear spar and compared the results to those gained from laboratory simulations. The laboratory simulations subjected spar test specimens to elevated temperatures in the range 260°C to 340°C for one hour before they were subject to conductivity and hardness test. These test specimens gave similar test results to that found on the rear spar on Nimrod XV227. This would seem to further confirm that the duct failed only a short period of time before landing. The conclusion of this work has identified that the minimum static reserve factor in this area has been reduced from 1.22 to 0.93 under the loads imposed by the current operational flight envelope. This reduction in static strength is below that which is normally accepted for safe unrestricted operation of the aircraft.

DISCUSSION OF FACTORS

26. Mode of Duct Failure. The failed duct was sent to BAES for investigation. The material specification of the duct was found to be correct albeit that it was in a softened condition. Extensive pitting and transgranular cracking corrosion was evident on all surfaces of the corrugated duct. The pitting corrosion was of significant depth; indeed, in some areas the duct had corroded through the majority of the wall thickness. The report concluded that the extent of the transgranular cracking and pitting corrosion caused sufficient weakness in the duct to cause the mechanical overload failures seen on sections of the fracture surface. This was the root cause of the incident.

27. Overpressurization of the SCP. The SCP system may have been overpressurized if the PRSOV had failed in the fully open position. This would have allowed air to be bled at engine pressures to the SCP system. However, the PRSOV was returned to manufacturer for bay checks and the item was deemed fully serviceable. Therefore, overpressurization of the SCP system was not a factor in the failure of the duct.

28. Maintenance Policy. There is no maintenance policy for this item and the ruptured duct is not subject to any specific inspection. In situ visual inspection is precluded by the corrugated duct being enclosed in a welded steel braid. The ruptured duct is only removed during scheduled maintenance to allow access to other components or aircraft structure. Once reassembled the SCP is subject to Maintenance Procedure (MP) 23-12/3 in AP101B-0503-1BJ. This test is designed to primarily ensure that the PRSOV is working at the correct pressure but in accomplishing this also pressurises the system to normal working pressure. This MP is carried out on Minor, Minor Star and Major servicing and after system rectification. The lack of a maintenance policy allowed the corrosion within the duct to go undetected until failure occurred. The lack of a maintenance policy was a contributory factor.

29. It is important to note that there are other ducts of similar construction used within the engine bleed air systems. As the conditions that caused the extensive corrosion in the ruptured duct are present throughout the rest of the system, it must be considered that other ducts will be subject to the effects of corrosion. However, the possible implications of a failure in some other sections of the bleed air system are mitigated by the presence of hot air leak warning systems. There is no hot air leak warning system for the ruptured duct or the cross-bleed air duct as it passes through the bomb bay.

30. Lifing Policy. BAES investigation shows that the ruptured duct was manufactured in 1980 but no records exist as to when this duct was fitted to the aircraft. The lack of a lifing policy allowed the corrosion within the duct to develop until failure occurred. The lack of a lifing policy was a contributory factor.

31. Orientation of Failure. The duct failed with the missing portion facing inwards towards the bomb bay skirt. This meant that the hot air escaping from the rupture was directed onto the airframe in the region of the rear lower spar and the forward face of No 7 Starboard fuel tank. A significant portion of the duct was missing. The orientation of the failure was an aggravating factor.

32. SCP Failure Flight Deck Indications. The Flow Limiting Venturi is designed to illuminate the underpressure warning light on the SCP control panel when a duct fails downstream of the Venturi. However, in this case the duct that failed is positioned between the PRSOV and the Venturi. Therefore, there would be no flow through the Venturi and hence no warning light would be illuminated on the SCP control panel. Although the duct rupture would be indicated by a Low

Mass Flow indication and a reduced pre-cooler temperature, there would be no positive warning indication on the flight deck of this duct failing. The lack of positive warning indications on the flight deck was an aggravating factor.

33. Human Factors – Distraction. It is considered that the duct failed at some point after the Bomb Bay doors were opened towards the end of the sortie. From this point onwards the workload on the flight deck would increase as the aircraft was prepared to leave the on task area and make the short transit to Kinloss. During that period, the windmilling engines would be restarted, the aircraft would be repressurised after sonobuoy launcher checks had been completed and the off task checklist actioned. In addition to this, the Student Air Engineer would have to complete the Vital Data Card giving the transit fuel and speeds for return to base. Due to the short transit time, the workload would be further increased as the Student Air Engineer considers the landing phase of the flight. This amount of activity, compressed into such a short period of time, may have resulted in a less frequent check of the SCP control panel. The Instructor Air Engineer from his position at the rear of the flight deck would not have been able to monitor the SCP control panel during this phase of flight. Furthermore, given the increased workload at top of descent when the SCP was switched off, it is likely that the Student Engineer did not notice the indications on the SCP control panel associated with a duct failure.

34. Fatigue. Although the recollections of the aircrew are vague due to the amount of time elapsed since the incident, they believed they were well rested and fully fit for the sortie. Hence fatigue was not considered to be a factor in this incident.

35. Flight Supervision. The Student Air Engineer was on sortie L14 of 24 sorties to be flown during Nimrod conversion. At the beginning of the sortie he had flown 65 hours. In addition, he had completed 16 of the 20 dynamic simulator exercises that are undertaken during the course. During both his flying and simulator exercises his progress was satisfactory for an ab-initio air engineer. Given this satisfactory level of progress, it would be normal for the Instructor Air Engineer to leave the student alone on the flight deck during the less demanding aspects of the sortie. This is necessary to allow the Student Air Engineer to build up his confidence to operate the aircraft autonomously. From the position that the Instructor Air Engineer stands at the rear of the flight deck it is difficult for him to monitor the SCP control panel. Due to the fact that the SCP was operating successfully up until the latter stages of the sortie, the Instructor Air Engineer would have been monitoring the Student's actions required for the off task phase rather than monitoring the SCP control panel.

36. Training. When carrying out training both on 42(Reserve) Sqn and subsequently during postgraduate dynamic simulator training, the concept of a duct rupturing and giving the symptoms previously described is not considered. The most usual training scenario is that of the PRSOV failing in the closed position due to electrical failure. This fault in the dynamic simulator would produce exactly the same symptoms as the duct rupturing between the PRSOV and the flow limiting venturi. If, as part of the initial Nimrod WSOp(E) training, the implications of a ruptured duct were highlighted and reinforced during routine dynamic simulator training, then the relatively benign indications of low cabin mass flow might be given a greater priority. Training was an aggravating factor.

37. Aircrew Manuals and Flight Reference Cards. The Aircrew Manual Flying Book 3 Aircraft Flight Systems AP101B-0503-15C gives advice in Part 2 Chapter 1 Para 36, the Failure of One Air Supply System, for the Air Engineer to use the appropriate SCP failure drill as detailed in the Flight Reference Cards (FRCs) if the following symptoms occur on the SCP control panel:

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- a. A rate of climb on the cabin RCDI.
- b. Cabin Mass Flow Indicator reading low.
- c. A decrease in pre-cooler outlet temperature.

When consulting the FRCs, card 22 Reverse to card 23 Reverse, there is no such drill listed for the SCP. However, there is a drill that does cover these symptoms on Card 21 Reverse under the heading of Failure of One Wing Air Supply System. Therefore, if the above symptoms had been noticed, and the advice in the Aircrew Manual Book 3 was followed, the Air Engineer would have found no advice in the SCP section of the FRCs. The lack of clear advice in the FRCs was a factor.

### **CONCLUSION**

38. The cause of the incident was pitting and transgranular cracking corrosion leading to mechanical failure of the SCP duct positioned between the PRSOV and the Flow Limiting Venturi.

### **RECOMMENDATIONS**

39. It is recommended that:

- a. A maintenance policy is investigated for the ruptured duct and all similar ducts.
- b. A lifing policy is introduced for the ruptured duct and all similar ducts.
- c. The ruptured duct is with replaced with new manufacture items on a fleet-wide basis as soon as possible.
- d. A hot air leak warning system is introduced for the ruptured duct and cross-air bleed ducts.
- e. The extent of the hot air leak warning system is reviewed to ensure that all possible duct failures are covered.
- f. This incident is highlighted as a training point for WSOp(E).
- g. The FRCs regarding SCP malfunctions are amended to reflect the information in the aircrew manuals.

### **OBSERVATIONS**

40. It was noted that:

- a. The unreliability of the Mission System Recorder may have led to valuable evidence being lost.

President UI XV227

Date: Jul 05

Enclosures:

1. Supplementary Cooling Pack Damage Sustained by Nimrod MR2 XV227.
2. Supplementary Cooling Pack System Diagram.
3. Nimrod MR2 SCP Ducting.

**REMARKS OF OC LSW**

1. The recommendations with an engineering flavour ( para 39a-e) are already very familiar to the NIPT and much work has already been started along the lines suggested. In particular, a SCP-duct sampling programme (coincidentally from XV227) will help inform the difficult decisions facing the NIPT when considering changes to the current on-condition lifing policy when faced with a DA recommended 90 fghr (approx P maintenance) inspection regime. This recommendation is deemed risk averse and almost certainly unaffordable and some informed compromise is needed.
2. As an interim, the recently replaced pipes which are now lifed and being monitored. This, together with the recent amendments to the Topic 14/15 should negate the need to pursue an dedicated warning system which given the current OSD and lead time, will probably also be deemed unaffordable.
3. I will continue to monitor the progress of this issue within the NIPT.

<original signed>

OC LSW

Date: 28 Jul 05

**REMARKS OF STN CDR**

1. When the insidious nature of this technical failure and severity of damage to the wing spar became clear, I ordered a UI to establish the cause. The area of the SCP involved was not subject to a maintenance policy; a particular concern as the ageing Nimrod MR2 is extended beyond its original OSD. The F765B comprehensively covers all the issues raised within the UI.
2. The recommendations and observations are all being actioned, the majority complete. From an operating perspective, the FRCs have been amended, education of Nimrod aircrew undertaken, whilst the supervisory issues could have wider applicability than the Nimrod MR2 fleet. However, one area I also consider to be a contributory factor was the lack of formal recording of the specific nature of the off-going air engineer's failure of the SCP prior to the crew who experienced the failure becoming airborne. Revised de-brief procedures have been introduced to address this.
3. This incident also highlights that it is particularly important that all who are involved in operating ageing aircraft be aware of the potential for failure in areas not previously subject to inspection regimes. This is not the first on the Nimrod MR2 in recent months. Airworthiness and design

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authorities need to be cognisant of this fact as new servicing schedules are proposed/debated; the unexpected failure should be ever at the forefront of our minds.

Stn Cdr

Date: 03 Aug 05