

Contents

Glossary of abbreviations used in this report	<i>(ix)</i>
Synopsis	1
1 Factual Information	3
1.1 History of the flight	3
1.2 Injuries to persons	5
1.3 Damage to aircraft	5
1.3.1 Investigation of roll control problem	5
1.3.2 Investigation of hot oil/electrical burning smells.....	7
1.3.3 Autothrottle system	8
1.4 Other damage	8
1.5 Personnel information	9
1.5.1 Commander	9
1.5.2 First Officer	9
1.5.3 Licenced Aircraft Engineer	10
1.5.4 Base Maintenance Technician.....	10
1.5.5 Certifying Technician.....	11
1.6 Aircraft information	11
1.6.1 Leading particulars.....	11
1.6.2 Wing trailing edge flap system description.....	12
1.6.3 Engine oil storage and quantity indication.....	13
1.6.4 Engine bearing sealing and venting	14
1.6.5 Cabin pressurisation and air conditioning systems.....	15
1.6.6 Maintenance performed prior to flight.....	15
1.6.7 Maintenance performed on the right wing.....	16
1.6.7.1 Background.....	16
1.6.7.2 Procedure for installing access panels	18
1.6.7.3 Certification for fitment of panels 666AR and 666BR.....	19
1.6.7.4 Location of job card racks	20
1.6.7.5 Environmental factors.....	21
1.6.8 Boeing 777 G-VIIA Air Driven Unit bay access door detachment	21

1.6.9	Engine oil servicing task	22
1.6.9.1	Technician's role - engine oil servicing	22
1.6.9.2	Certification of engine oil servicing task	24
1.6.10	Aircraft Maintenance Manual procedure for engine oil servicing	25
1.6.11	Maintenance Organisation's instructions for oil servicing	26
1.6.12	Engine oil servicing procedures on the ramp	27
1.6.13	Quality Audit of engine oil servicing procedures	28
1.6.14	Previous history of oil smell problems	29
1.6.15	Other recent Boeing 757 oil smell incidents	31
1.7	Meteorological information	31
1.8	Aids to navigation	31
1.8.1	Instrument Landing System (ILS), London Gatwick Runway 26L	31
1.9	Communications	31
1.10	Aerodrome information	32
1.11	Flight recorders	33
1.11.1	FDR/CVR description	33
1.11.2	Relevant UFDR Information	33
1.12	Wreckage and impact information	34
1.13	Medical and pathological information	34
1.14	Fire	34
1.15	Survival aspects	34
1.16	Tests and research	34
1.17	Organisational and management information	36
1.17.1	The Airline's Safety Management System	36
1.17.1.1	Tracking of safety issues	38
1.17.1.2	Independent safety oversight	38
1.17.1.3	Implementation of safety recommendations	40
1.17.2	Requirements pertaining to aircraft maintenance	40
1.17.3	Certification of maintenance	41
1.17.4	JAR-145 Quality System requirements	42
1.17.5	Philosophy of Quality Assurance	43
1.17.6	Implementation of Quality Assurance in the Maintenance Organisation	43

1.17.7	Non-Conformances	45
1.17.8	Engineering Quality Services Department.....	45
1.17.9	Quality department (EQS) oversight of maintenance activities.....	47
1.17.10	The Airline's internal safety investigations.....	47
1.17.10.1	Background.....	47
1.17.10.2	EQS Quality Investigation findings.....	48
1.17.10.3	Corrective actions taken by the Maintenance Organisation.....	49
1.17.11	Principles of Maintenance Error Investigation (MEI)	49
1.17.12	G-CPER Maintenance Error Investigation	50
1.17.13	The Management perspective	51
1.17.14	Technical training.....	52
1.17.15	Organisation and supervision of maintenance staff	53
1.17.16	Flight crew actions	54
1.18	New investigation techniques.....	54
2	Analysis	55
2.1	Roll control problem	55
2.2	Hot oil/electrical burning smells	55
2.3	Conduct of the maintenance	56
2.3.1	General	56
2.3.2	Procedure for controlling access panels.....	57
2.3.2.1	General.....	57
2.3.2.2	Flap panels 666AR and 666BR	57
2.3.3	Engine oil servicing procedures	59
2.3.4	Behaviour and actions of the LAEs	59
2.3.4.1	Panels 666AR and 666BR	59
2.3.4.2	Certification for engine oil servicing task	60
2.4	The Maintenance Organisation's Quality Assurance Programme.....	60
2.5	Supervision and organisation of hangar staff.....	61
2.6	Similarities between the B777 (G-VIIA) and G-CPER incidents.....	62
2.7	Conduct of the Maintenance Error Investigation	62
2.8	Role of the Safety Services Department	63
2.9	Consequences of failing to install or secure critical panels	64
2.10	Flight crew actions	64

3	Conclusions	65
(a)	Findings	65
(b)	Causal Factors	68
4	Safety Recommendations	69
5	Airline's response to Safety Recommendations	70

APPENDICES

1	Job Cards for fitment of R/H outboard flap panels 666AR and 666BR
2	Daily Check Inspection Sheet (engine oil servicing task highlighted)
3	Boeing 757 AMM Panel Chart showing location of Panels 666AR and 666BR
4	RB211 Engine Oil System Schematic