

Analysis of AF447 ACARS

ATA	PH	Typ	Sel	Libelle succinct du message	Date	Novo	PILOT VIEW	Flightdeck	
22	10	6	WRN	WN0906010210	221002006AUTO FLT AP OFF	1/6/2009	AF447	ECAM warning to pilots informing them the Involuntary AutoPilot Disconnect, normal disconnect only shows AP OFF. This disconnection can cause by system failure (failure of the autopilot or failure of system used by the autopilot) that is coming up, or it could be due to turbulence and the AP can no longer hold the the reference speed and altitude within the limits.	Warning display
22	62	6	WRN	WN0906010210	226201006AUTO FLT	1/6/2009	AF447	This could mean anything.	
27	91	6	WRN	WN0906010210	279100506F/CTL ALTN LAW	1/6/2009	AF447	ECAM warning to pilots informing them that Flight Control protection has been degraded. High Speed, Low Speed has been lost. Bank and Angle of Attack Protection is degraded. This is cause by multiple system malfunctions. Airbus design their systems so that one system degradaton will not bring the aircraft to Alternate Law.	Warning display
22	83	6	WRN	WN0906010210	228300206FLAG ON CAPT PFD	1/6/2009	AF447	FLAG on PFD means a degradation on information being display on the Primary Flight Display. In this case, falling to Alternate Law will causes the display to indicate two amber "xx", which indicate bank angle protetion is lost. However, there are no physical ECAM trigger for this kind of warning, pilot just need to pick the info up on their own from their PFD.	
22	83	6	WRN	WN0906010210	228301206FLAG ON F/O PFD	1/6/2009	AF447	Same as above.	
22	30	6	WRN	WN0906010210	223002506AUTO FLT A/THR OFF	1/6/2009	AF447	ECAM warning to pilot informing them that an involuntary Auto Thrust Disconnect has occured, normal auto-thrust disconnect only show A/THR OFF. This disconnection can be caused by a system failure (either the autothrust system of other system that will have an impact of the autothrust system).	Warning display
34	43	6	WRN	WN0906010210	344300506NAV TCAS FAULT	1/6/2009	AF447	ECAM warning to pilots informing them of a TCAS fault. When I first look at it, it seems like this is a totally unrelated fault, however, after looking into my manual, I discover that if IR1 fault, it will automatically cause the TCAS to become inoperative.	Warning display
22	83	6	WRN	WN0906010210	2283001006FLAG ON CAPT PFD	1/6/2009	AF447	Again, more degradation to the pilot PFD. This can be due to the IR faults from below or from the Rudder Travel Limiter Fault below.	
22	83	6	WRN	WN0906010210	228301106FLAG ON F/O PFD	1/6/2009	AF447	See above.	

Analysis of AF447 ACARS

27	23	6	WRN	WN0906010210	272302006F/CTL RUD TRV LIM FAULT	1/6/2009	AF447	ECAM Rudder Travel Limiter Fault. This is a system that limits the travel of the rudder to avoid overstressing the rudder. It is a physical limiter located at the back of the Rudder. When this system fails, pilot need to use rudder with care above 160kts.	Warning display
27	90	6	WRN	WN0906010210	279045506MAINTENANCE STATUS	1/6/2009	AF447		
27	90	6	WRN	WN0906010210	279045006MAINTENANCE STATUS	1/6/2009	AF447		
34	11	6	FLR	WN0906010210	34111506EFCS2 1,EFCS1,AFS,,,,,P	1/6/2009	AF447	Electrical Flight Control System 1 and 2 Fault, this could mean anything. An engineering expert might be able to help you on this one.	Apparently a pitot message
27	93	6	FLR	WN0906010210	27933406EFCS1 X2,EFCS2X,,,,,FC	1/6/2009	AF447	See above.	
34	12	6	WRN	WN0906010211	341200106FLAG ON CAPT PFD	1/6/2009	AF447	FLAG on PFD, this could be due to the IR fault, ADR fault from below. So this indicates there are further degradations on the information provided to the pilot.	
34	12	6	WRN	WN0906010211	341200106FLAG ON F/O PFD	1/6/2009	AF447	See above.	
34	10	6	WRN	WN0906010212	341040006NAV ADR DISAGREE	1/6/2009	AF447	NAV ADR DISAGREE means that the primary flight computer has rejected data from one of the Air Data Reference as it has 'strayed away' from the other 2 systems.	Warning display
34	22	6	FLR	WN0906010211	34220006ISIS 1,,,,,,ISIS (22FN	1/6/2009	AF447	ISIS = Intergrated Standby Instrument System fault. ISIS is a standby instrument that uses the standby pitot and static port with it's own separate gyro and accerolmeter. This provides a completely separate, standby instrument functions to the pilot if all other instrument on the aircraft has fail. However in this case, this has been lost as well. (Note original had 12 instead of 22.)	
34	12	6	FLR	WN0906010211	34123406IR2 1,EFCS1X,IR1,IR3,	1/6/2009	AF447	IR1, 2, 3 fault. This is the most unimaginable thing that could happen. IR = Inertial Reference System, provide the aircraft Attitude, Flight Path Vector, Track, Heading, Acceleration, Angular Rates, Ground Speed, Vertical Speed, and aircraft position. So with all 3 IR fault... you have now lost all Attitude and vertical speed, information. Since ISIS has already failed, you now have a situation where the pilot is flying blind.	
27	90	6	WRN	WN0906010213	279002506F/CTL PRIM 1 FAULT	1/6/2009	AF447	ECAM warning to pilot that the primary flight control computer fault. In normal situation it is no big deal as we have 3 primary computers on the Airbus (any 1 prim or sec can fly the aircraft). In this case, it just increased the work load.	Warning display

Analysis of AF447 ACARS

27 90 6 WRN WN0906010213 279004006F/CTL SEC 1 FAULT 1/6/2009 AF447								ECAM warning to pilot that the secondary flight control computer fault. In normal situation, it is nobig deal as we have 2 secondary computer on Airbus (any 1 prim or sec can fly the aircraft). Again this just increased the workload and stress.	Warning display
34	10	6	WRN	WN0906010214	341036006MAINTENANCE STATUS	1/6/2009	AF447		
22	83	6	FLR	WN0906010213	22833406AFS 1,,,,,,,,,FMGEC1 (1C	1/6/2009	AF447	FMGEC = Flight Management Guidance Envelope Computer fault. Again, in normal situation this is no big deal but in this case, it adds to the work load.	
21	31	6	WRN	WN0906010214	213100206ADVISORY	1/6/2009	AF447		

In conclusion, the major failure that will give a lot of trouble to the pilot is IR1, 2, 3, and ISIS failure. With all 4 of these item failed, you are now offically flying blind. You have no attitude indication, so you don't know are you flying up or down, left or right. You can only resort to visual flight, but I believe this was a night flight.