Annex A

Alarm list (IAS and P1200)

Alarm filter

Endtime: 2010-09-23 02:40:33 Timespan: 0.5 HOUR(S)
Tag name:
Description:
Alarm group:
Alarm priority: Critical & Normal & Passive & None
Alarm text:
Alarms from: MAS

Time Error *5'14"

Time	Priority	Alarm group	Tag	Description	Value
2010/09/23 02:10:45.500	!	P20	4057	DG4 EXH.GAS AAA8D	MEAS. < LL
2010/09/23 02:12:54.040	!	P21	6320	INCINERATOR A	FAULT CRITICAL
2010/09/23 02:13:44	--	P20	4057	DG4 EXH.GAS AAA8D	MEAS. < LL
2010/09/23 02:13:54.020	--	P09	P_31_053	POD3 STEERING	MECHANIC FAULT
2010/09/23 02:16:00.540	!	P20	4054	DG1 EXH.GAS AAA8A	MEAS. < LL
2010/09/23 02:16:04.150	--	P20	5029	ATMOSPHERIC HOTWELL	MEAS. > HL
2010/09/23 02:16:04.270	--	P21	6320	INCINERATOR A	FAULT CRITICAL
2010/09/23 02:17:00.980	!	P02	D_42_GT144B	DG4 FO CTRL VLV B4 P	IO-FAULT
2010/09/23 02:17:29.190	!	P20	B_2_WHL	BOILER 2 VA1B WATER	HIGH LEVE
2010/09/23 02:17:36.040	!	P21	6322	INCINERATOR B	FAULT CRITICAL
2010/09/23 02:18:23.050	!	P21	6320	INCINERATOR A	FAULT CRITICAL
2010/09/23 02:18:41.240	--	P02	D_42_GT144B	DG4 FO CTRL VLV B4 P	IO-FAULT
2010/09/23 02:19:43.320	!	P24	6470	OUT CIRC HOT W PP	LOW FLOW
2010/09/23 02:20:44.320	!	P29	1717	PASS.LIFT 20	ALARM CALL
2010/09/23 02:22:20.310	--	P29	1717	PASS.LIFT 20	ALARM CALL
2010/09/23 02:23:32.100	!	P20	4057	DG4 EXH.GAS AAA8D	MEAS. < LL
2010/09/23 02:23:46.700	--	P20	4054	DG1 EXH.GAS AAA8A	MEAS. < LL
2010/09/23 02:25:13.450	!	P16	1574	GW PUMP DGT10A	NO STBY PUMP
2010/09/23 02:25:14.700	!	P16	1575	GW PUMP DGT10B	NO STBY PUMP
2010/09/23 02:26:15.040	--	P21	6320	INCINERATOR A	FAULT CRITICAL
2010/09/23 02:26:16.040	!	P21	6320	INCINERATOR A	FAULT CRITICAL
2010/09/23 02:26:40.190	--	P20	B_2_WHL	BOILER 2 VA1B WATER	HIGH LEVE
2010/09/23 02:27:08.050	--	P21	6322	INCINERATOR B	FAULT CRITICAL
2010/09/23 02:27:11.320	--	P24	6470	OUT CIRC HOT W PP	LOW FLOW
2010/09/23 02:27:20.940	--	P20	4057	DG4 EXH.GAS AAA8D	MEAS. < LL
2010/09/23 02:27:54.950	--	P21	6320	INCINERATOR A	FAULT CRITICAL
2010/09/23 02:30:06.130	!	P20	5029	ATMOSPHERIC HOTWELL	MEAS. > HL
2010/09/23 02:30:17.430	!	P20	4057	DG4 EXH.GAS AAA8D	MEAS. < LL
2010/09/23 02:30:25.180	!	P30	1552	ATV3DB1 CABINET	SUPPLY FAULT
2010/09/23 02:30:25.180	!	P30	1554	ATV5DB1 CABINET	SUPPLY FAULT
2010/09/23 02:30:25.190	!	P30	1548	ATV70B2 CABINET	SUPPLY FAULT
2010/09/23 02:30:25.190	!	P08	738	AEDG 24V RECTIFIER	COMMON ALARM
2010/09/23 02:30:25.190	!	P08	742	GTG2 24V RECTIFIER	COMMON ALARM
2010/09/23 02:30:25.190	!	P08	743	ECR 24V RECTIFIER	COMMON ALARM
2010/09/23 02:30:25.190	!	P30	751	ATV4011 CABINET	SUPPLY FAULT
2010/09/23 02:30:25.190	!	P30	752	ATV5011 CABINET	SUPPLY FAULT
2010/09/23 02:30:25.200	!	P30	750	ATV3011 CABINET	SUPPLY FAULT
2010/09/23 02:30:25.210	**	P16	6385	BW TREATMENT UNIT	FAULT CRITICAL
2010/09/23 02:30:25.210	!	P30	755	ATV8011 CABINET	SUPPLY FAULT
2010/09/23 02:30:25.220	--	P24	6464	PRE-CHLORINE UNIT	CHLORINE FAULT
2010/09/23 02:30:25.220	!	P30	975	TENDERBOAT 18 UPS	FAILURE
2010/09/23 02:30:25.230	!	P02	1240	DG2 UPS2	COMMON ALARM
2010/09/23 02:30:25.230	!	P02	1340	DG3 UPS3	COMMON ALARM
2010/09/23 02:30:25.230	!	P02	1440	DG4 UPS4	COMMON ALARM
2010/09/23 02:30:25.240	!	P30	1553	ATV4DB1 CABINET	SUPPLY FAULT
2010/09/23 02:30:25.240	!	P30	663	NAVIGATION	ALARM
2010/09/23 02:30:25.240	!	P30	754	ATV7011 CABINET	SUPPLY FAULT
2010/09/23 02:30:25.250	!	P08	667	HVAC UPS401	COMMON ALARM
2010/09/23 02:30:25.260	!	P08	744	EDG 24V RECTIFIER	COMMON ALARM
2010/09/23 02:30:25.300	!	P30	753	ATV6011 CABINET	SUPPLY FAULT
2010/09/23 02:30:25.330	!	P16	6404	GREASE TRAP DKDB	FAULT
2010/09/23 02:30:25.350	!	P08	391	TP12F AUX. CTRL.	FAULT
2010/09/23 02:30:25.360	!	P08	389	TP11F AUX. CTRL.	FAULT

2010/09/23 02:30:25.370 !	P18	6604	MONO WHIRL.TUS10D	FAULT
2010/09/23 02:30:25.370 !	P18	6612	TWIN WHIRL.TUS10H/I	FAULT
2010/09/23 02:30:25.370 !	P18	6620	MONO WHIRL.TUS10G	FAULT
2010/09/23 02:30:25.370 !	P04	6993	CMM91AAT ELEC PANEL	FAILURE
2010/09/23 02:30:25.370 !	P30	961	LIFEBOAT 6 UPS	FAILURE
2010/09/23 02:30:25.370 !	P30	969	TENDERBOAT 12 UPS	FAILURE
2010/09/23 02:30:25.370 !	P30	970	TENDERBOAT 13 UPS	FAILURE
2010/09/23 02:30:25.370 !	P30	972	TENDERBOAT 16 UP	FAILURE
2010/09/23 02:30:25.370 !	P30	978	LIFEBOAT 22 UPS	FAILURE
2010/09/23 02:30:25.380 !	P04	6995	CMM91BAT ELEC PANEL	FAILURE
2010/09/23 02:30:25.380 !	P30	920	CATHODIC PROTEC.FWD	ALARM
2010/09/23 02:30:25.380 !	P30	956	LIFEBOAT 1 UPS	FAILURE
2010/09/23 02:30:25.380 !	P30	957	LIFEBOAT 2 UPS	FAILURE
2010/09/23 02:30:25.380 !	P30	958	LIFEBOAT 3 UPS	FAILURE
2010/09/23 02:30:25.380 !	P30	959	LIFEB AT UPS	FAILURE
2010/09/23 02:30:25.380 !	P30	960	LIFEBOAT 5 UPS	FAILURE
2010/09/23 02:30:25.380 !	P30	962	LIFEBOAT 7 UPS	FAILURE
2010/09/23 02:30:25.380 !	P30	963	LIFEBOAT 8 UPS	FAILURE
2010/09/23 02:30:25.380 !	P30	964	LIFEBOAT 9 UPS	FAILURE
2010/09/23 02:30:25.380 !	P30	965	LIFEBOAT 10 UPS	FAILURE
2010/09/23 02:30:25.380 !	P30	966	RESCUEBOAT 23 UPS	FAILURE
2010/09/23 02:30:25.380 !	P30	967	RESCUEBOAT 24 UPS	FAILURE
2010/09/23 02:30:25.380 !	P30	968	TENDERBOAT 11 UPS	FAILURE
2010/09/23 02:30:25.380 !	P30	973	TENDERBOAT 15 UPS	FAILURE
2010/09/23 02:30:25.380 !	P30	974	TENDERBOAT 17 UPS	FAILURE
2010/09/23 02:30:25.380 !	P30	976	LIFEBOAT 19 UPS	FAILURE
2010/09/23 02:30:25.380 !	P30	977	LIFEBOAT 20 UPS	FAILURE
2010/09/23 02:30:25.380 !	P30	979	LIFEBOAT 21 UPS	FAILURE
2010/09/23 02:30:25.390 !	P16	6412	AFT RHODIA BUF.TK	COMMON ALARM
2010/09/23 02:30:25.390 !	P16	6417	FWD RHODIA BUF.TK	COMMON ALARM
2010/09/23 02:30:25.390 !	P18	6608	TWIN WHIRL.TUS10E/F	FAULT
2010/09/23 02:30:25.390 !	P30	971	TENDERBOAT 14 UPS	FAILURE
2010/09/23 02:30:25.400 !	P08	741	GTG1 24V RECTIFIER	COMMON ALARM
2010/09/23 02:30:25.400 !	P30	922	CATHODIC PROTEC.AFT	ALARM
2010/09/23 02:30:25.410 !	P02	4292	FILT.CMM24A MOD.	CLOGGED
2010/09/23 02:30:25.410 !	P02	4297	FILT.CMM24B MOD.	CLOGGED
2010/09/23 02:30:25.410 !	P02	6117	DG4 C M.RAIL FILT.	FILTER FAILURE
2010/09/23 02:30:25.420 !	P30	1555	ATV5DB2 CABINET	SUPPLY FAULT
2010/09/23 02:30:25.420 !	P14	5448	INFRAPHONE STBY COMP	FAULT
2010/09/23 02:30:25.420 !	P02	6113	DG2 COM.RAIL FILT.	FILTER FAILURE
2010/09/23 02:30:25.420 !	P02	6115	DG3 COM.RAIL FILT.	FILTER FAILURE
2010/09/23 02:30:25.430 !	P30	1547	ATV70B1 CABINET	SUPPLY FAULT
2010/09/23 02:30:25.430 !	P30	1556	ATV60B1 CABINET	SUPPLY FAULT
2010/09/23 02:30:25.440 !	P14	5446	INFRAPHONE COMP.	FAULT
2010/09/23 02:30:25.450 --	P08	413	TPFEA INSULATION	FAULT
2010/09/23 02:30:25.450 !	P02	6111	DG1 COM.RAIL FILT.	FILTER FAILURE
2010/09/23 02:30:25.450 !	P16	6403	GREASE TRAP DKB	FAULT
2010/09/23 02:30:25.450 --	P30	747	AFT MOORING DECK	GENARAL FAILURE
2010/09/23 02:30:25.460 --	P08	410	TP2FE INSULATION	FAULT
2010/09/23 02:30:25.460 !	P02	6170	DG1&2 FUEL PREP.UNIT	COMMON FAILURE
2010/09/23 02:30:25.460 !	P02	6171	DG3&4 FUEL PREP.UNIT	COMMON FAILURE
2010/09/23 02:30:25.470 **	P16	6400	GW TREATMENT UNIT	FAULT CRITICAL
2010/09/23 02:30:25.470 --	P18	6445	CH.SP.POOL TREA.UNIT	FAULT
2010/09/23 02:30:25.480 !	P18	6616	TWIN WHIRL.TUS10K/J	FAULT
2010/09/23 02:30:25.480 !	P08	918	IASUPSB FZ6 UPS 230V	FAILURE
2010/09/23 02:30:25.490 !	P16	6388	BW TREATMENT UNIT	FLT NON CRITIC
2010/09/23 02:30:25.510 --	P08	411	TPFES INSULATION	FAULT
2010/09/23 02:30:25.520 !	P29	1673	PASS.LIFT 10	CONTROL FAILURE
2010/09/23 02:30:25.520 !	P29	1718	PASS.LIFT 20	CONTROL FAILURE
2010/09/23 02:30:25.520 !·	P16	6402	GW TREATMENT UNIT	FLT NON CRITIC
2010/09/23 02:30:25.530 !	P08	381	TP5F AUX. CTRL.	FAULT
2010/09/23 02:30:25.530 !	P08	383	TP6F AUX. CTRL.	FAULT
2010/09/23 02:30:25.530 !	P08	385	TP7F AUX. CTRL.	FAULT

2010/09/23 02:30:25.530 !	P08	387	TP8F AUX. CTRL.	FAULT
2010/09/23 02:30:25.530 !	P18	6448	A.POOL DK8 TREA.UNIT	FAULT
2010/09/23 02:30:25.530 !	P08	666	HVAC UPS301	COMMON ALARM
2010/09/23 02:30:25.530 !	P08	670	HVAC UPS602	COMMON ALARM
2010/09/23 02:30:25.540 !	P08	668	HVAC UPS501	COMMON ALARM
2010/09/23 02:30:25.550 !	P08	544	HVAC UPS901	COMMON ALARM
2010/09/23 02:30:25.550 !	P23	6251	START.AIR COMP.KKK1A	FAULT
2010/09/23 02:30:25.570 !	P08	509	TP1HT BUSBAR F	IO-FAULT
2010/09/23 02:30:25.570 !	P08	520	TP1HT DG2 REACT	IO-FAULT
2010/09/23 02:30:25.570 !	P08	524	TP1HT DG3 REACT	IO-FAULT
2010/09/23 02:30:25.570 !	P08	528	TP1HT DG4 REACT	IO-FAULT
2010/09/23 02:30:25.570 !	P08	545	TP2HT BUSBAR F	IO-FAULT
2010/09/23 02:30:25.590 !	P08	1443	HARM.F HF2MPE RANKS	OVERLOAD/UNBAL
2010/09/23 02:30:25.590 !	P23	6250	START.AIR COMP.KKK1B	FAULT
2010/09/23 02:30:25.660 --	P04	1956	GTG1 COMMON PREALARM	ACTIVE
2010/09/23 02:30:25.670 !	P08	718	TP1F BUS BAR	DISCREPANCY –Loss of one phase
2010/09/23 02:30:25.670 !	P29	990	PASS.LIFT 4	CONTROL FAILURE
2010/09/23 02:30:25.680 !	P29	984	PASS.LIFT 2	CONTROL FAILURE
2010/09/23 02:30:25.690 !	P29	1749	CREW LIFT 25	CONTROL FAILURE
2010/09/23 02:30:25.700 !	P02	1113	DG1 ENGINE TORS.VIB.	IO-FAULT
2010/09/23 02:30:25.700 !	P02	1115	DG1 TCA VIBRATION	IO-FAULT
2010/09/23 02:30:25.700 !	P02	1117	DG1 TCB VIBRATION	IO-FAULT
2010/09/23 02:30:25.700 !	P02	1213	DG2 ENGINE TORS.VIB.	IO-FAULT
2010/09/23 02:30:25.700 !	P02	1313	DG3 ENGINE TORS.VIB.	IO-FAULT
2010/09/23 02:30:25.700 !	P29	1746	PASS.LIFT 24	CONTROL
2010/09/23 02:30:25.700 !	P01	6001	DG2 OPACIMETER	IO-FAULT
2010/09/23 02:30:25.700 !	P01	6002	DG3 OPACIMETER	IO-FAULT
2010/09/23 02:30:25.700 !	P01	6003	DG4 OPACIMETER	IO-FAULT
2010/09/23 02:30:25.700 !	P24	6467	OUT NEUTR/MINER.	IO-FAULT
2010/09/23 02:30:25.700 !	P08	722	TP2F BUS BAR	DISCREPANCY
2010/09/23 02:30:25.700 !	P29	981	PASS.LIFT 1	CONTROL FAILURE
2010/09/23 02:30:25.700 !	P29	987	PASS.LIFT 3	CONTROL FAILURE
2010/09/23 02:30:25.710 !	P29	1692	PASS.LIFT 13	CONTROL FAILURE
2010/09/23 02:30:25.710 !	P24	4074	EVAPORATOR 3 DAA13B	HIGH VACUUM
2010/09/23 02:30:25.710 --	P24	6076	EVAPORATOR 3 DAA13B	FAULT
2010/09/23 02:30:25.710 --	P24	6396	EVAPORATOR 3 DAA13B	HIGH SALINITY
2010/09/23 02:30:25.720 !	P29	1768	PASS.LIFT 30	CONTROL FAILURE
2010/09/23 02:30:25.720 !	P29	993	PASS.LIFT 5	CONTROL FAILURE
2010/09/23 02:30:25.730 !	P29	1789	PASS.LIFT 32	CONTROL FAILURE
2010/09/23 02:30:25.730 !	P08	730	TP4F BUS BAR	DISCREPANCY
2010/09/23 02:30:25.740 !	P08	1594	TP11F BUS BAR	DISCREPANCY
2010/09/23 02:30:25.740 !	P29	1665	CREW LIFT 8	CONTROL FAILURE
2010/09/23 02:30:25.740 !	P29	1668	PASS.LIFT 9	CONTROL FAILURE
2010/09/23 02:30:25.740 !	P29	1706	CREW LIFT 16	CONTROL FAILURE
2010/09/23 02:30:25.740 !	P29	1727	PASS.LIFT 23	CONTROL FAILURE
2010/09/23 02:30:25.740 !	P29	996	CREW LIFT 6	CONTROL FAILURE
2010/09/23 02:30:25.750 !	P29	1676	PASS.LIFT 11	CONTROL FAILURE
2010/09/23 02:30:25.750 !	P29	1715	PASS.LIFT 19	CONTROL FAILURE
2010/09/23 02:30:25.750 !	P29	1786	PASS.LIFT 31	CONTROL FAILURE
2010/09/23 02:30:25.750 !	P29	1810	CREW LIFT 35	CONTROL FAILURE
2010/09/23 02:30:25.760 !	P29	1695	PASS.LIFT 14	CONTROL FAILURE
2010/09/23 02:30:25.760 !	P29	1698	CREW LIFT 15	CONTROL FAILURE
2010/09/23 02:30:25.760 !	P29	1721	PASS.LIFT 21	CONTROL FAILURE
2010/09/23 02:30:25.760 !	P29	999	CREW LIFT 7	CONTROL FAILURE
2010/09/23 02:30:25.770 !	P29	1882	SERV.LIFT 36	CONTROL FAILURE
2010/09/23 02:30:25.780 !	P29	1679	PASS.LIFT 12	CONTROL FAILURE
2010/09/23 02:30:25.790 !	P29	1757	CREW LIFT 27	CONTROL FAILURE
2010/09/23 02:30:25.800 !	P29	1795	PASS.LIFT 33	CONTROL FAILURE
2010/09/23 02:30:25.810 !	P10	4133	OUT PROPUL.FW PPS SB	MEAS. < LL
2010/09/23 02:30:25.810 !	P08	492	RMU7 POWER PFE70	IO-FAULT
2010/09/23 02:30:25.810 !	P08	492_S	RMU7 POWER PFE70	IO-FAULT
2010/09/23 02:30:25.810 !	P08	493	RMU7 POWER PFE71	IO-FAULT
2010/09/23 02:30:25.810 !	P08	589	TPFA BUSBAR FREQ.	IO-FAULT

2010/09/23 02:30:25.810 !	P08	595	TPFS BUSBAR FREQ.	IO-FAULT
2010/09/23 02:30:25.810 !	P20	6062	ATMO HOTWELL UNIT	IO-FAULT
2010/09/23 02:30:25.810 !	P17	6163	MGO FLOW ADDING UP	IO-FAULT
2010/09/23 02:30:25.830 !	P24	4073	EVAPORATOR 2 DAA13A	HIGH VACUUM
2010/09/23 02:30:25.840 !	P08	333	MPE POD3 UPS	COMMON ALARM
2010/09/23 02:30:25.840 !	P24	4072	EVAPORATOR 1 DAA12	HIGH VACUUM
2010/09/23 02:30:25.860 !	P29	1709	PASS.LIFT 17	CONTROL FAILURE
2010/09/23 02:30:25.880 !	P30	1145	REPEATER ATC2121	POWER SUP.FAULT
2010/09/23 02:30:25.890 !	P29	1885	SERV.LIFT 37	CONTROL FAILURE
2010/09/23 02:30:25.920 !	P08	344	INTERPHONE UPS	COMMON ALARM
2010/09/23 02:30:25.930 !	P08	1597	TP12F BUS BAR	DISCREPANCY
2010/09/23 02:30:25.970 !	P02	1225	DIESEL GENERATOR 2	VOLT.NOT ESTAB.
2010/09/23 02:30:25.970 !	P02	1325	DIESEL GENERATOR 3	VOLT.NOT ESTAB.
2010/09/23 02:30:25.970 !	P02	1425	DIESEL GENERATOR 4	VOLT.NOT ESTAB.
2010/09/23 02:30:25.970 !	P08	519	TP1HT DG2 INTENSITY	IO-FAULT
2010/09/23 02:30:25.970 !	P08	523	TP1HT DG3 INTENSITY	IO-FAULT
2010/09/23 02:30:25.970 !	P08	527	TP1HT DG4 INTENSITY	IO-FAULT
2010/09/23 02:30:26 !	P08	125	HARM FILT CB QHT770	EL. FAULT
2010/09/23 02:30:26 !	P08	361	TR2HT OIL FLOW	LOW FLOW
2010/09/23 02:30:26.020 !	P13	1534	HI FOG CTRL CABINET	SYSTEM FAILURE
2010/09/23 02:30:26.030 !	P29	1712	PASS.LIFT 18	CONTROL FAILURE
2010/09/23 02:30:26.060 !	P12	316	TRANSIT SWBD TFES141	INSULATION FAUL
2010/09/23 02:30:26.080 !	P29	1807	PASS.LIFT 34	CONTROL FAILURE
2010/09/23 02:30:26.090 !	P29	1765	SERV.LIFT 29	CONTROL FAILURE
2010/09/23 02:30:26.100 !	P30	1146	REPEATER ATC5011	POWER SUP.FAULT
2010/09/23 02:30:26.100 !	P29	1762	SERV.LIFT 28	CONTROL FAILURE
2010/09/23 02:30:26.110 !	P11	1164	STABILIZERS FWD	GENERAL ALARM
2010/09/23 02:30:26.110 !	P11	1264	STABILIZERS AFT	GENERAL ALARM
2010/09/23 02:30:26.110 !	P21	1609	INCINERATOR A	EMERGENCY STOP
2010/09/23 02:30:26.110 !	P21	1611	INCINERATOR B	EMERGENCY STOP
2010/09/23 02:30:26.110 !	P08	427	F.PMP ILT1D EM.POWER	NOT ALIVE
2010/09/23 02:30:26.110 !	P21	6320	INCINERATOR A	FAULT CRITICAL
2010/09/23 02:30:26.110 !	P21	6322	INCINERATOR B	FAULT CRITICAL
2010/09/23 02:30:26.110 !	P16	6410	AFT RHODIA BUF.TK	IO-FAULT
2010/09/23 02:30:26.110 !	P18	6440	A.POOL DK8 HEAT.OUT.	LOW FLOW
2010/09/23 02:30:26.110 !	P17	6579	MGO PURIF.1 CCC13A	FAULT
2010/09/23 02:30:26.110 !	P17	6580	MGO PURIF.2 CCC13B	FAULT
2010/09/23 02:30:26.110 !	P17	6581	MGO PURIF.3 CCC13C	FAULT
2010/09/23 02:30:26.130 !	P30	1147	REPEATER ATC6011	POWER SUP.FAULT
2010/09/23 02:30:26.130 !	P08	335	MPE POD4 UPS	COMMON ALARM
2010/09/23 02:30:26.150 !	P08	331	MPE POD2 UPS	COMMON ALARM
2010/09/23 02:30:26.160 !	P08	919	IASUPSA ECR UPS 230V	FAILURE
2010/09/23 02:30:26.170 !	P30	1148	REPEATER ATC7011	POWER SUP.FAULT
2010/09/23 02:30:26.170 !	P30	1149	REPEATER ATC8011	POWER SUP.FAULT
2010/09/23 02:30:26.170 **	SYS	AL10	STATION ON BATTERY	-
2010/09/23 02:30:26.190 !	P10	P_41_012	POD4 CONVERTER 1	FAULT
2010/09/23 02:30:26.190 !	P10	P_41_015	POD4 EXCITATION	FAULT
2010/09/23 02:30:26.190 !	P10	P_41_016	POD4 PROP1 CTRL	FAULT
2010/09/23 02:30:26.190 !	P10	P_42_012	POD4 CONVERTER 2	FAULT
2010/09/23 02:30:26.190 !	P10	P_42_016	POD4 PROP2 CTRL	FAULT
2010/09/23 02:30:26.220 !	P10	P_32_012	POD3 CONVERTER 2	FAULT
2010/09/23 02:30:26.220 !	P10	P_32_016	POD3 PROP2 CTRL	FAULT
2010/09/23 02:30:26.250 !	P30	1551	ATV20A1 CABINET	SUPPLY FAULT
2010/09/23 02:30:26.260 --	P20	1144	CLEAN STEAM GENERAT.	HIGH PRESSURE
2010/09/23 02:30:26.260 !	P14	2897	OB DRY COMP.PS	DISTURBANCE
2010/09/23 02:30:26.260 !	P08	357	TR1HT OIL FLOW	LOW FLOW
2010/09/23 02:30:26.260 !	P08	369	TR4HT OIL FLOW	LOW FLOW
2010/09/23 02:30:26.260 !	P02	5243	FUEL MIXING TK CMM9B	LOW LEVEL
2010/09/23 02:30:26.260 !	P20	6041	OIL FIRED BOILER 1	FAULT
2010/09/23 02:30:26.260 !	P20	6042	OIL FIRED BOILER 2	FAULT
2010/09/23 02:30:26.260 !	P17	6124	LO PURIFIER C GTT6C	FAULT
2010/09/23 02:30:26.260 !	P17	6125	LO PURIFIER D GTT6D	FAULT
2010/09/23 02:30:26.260 !	P16	6415	FWD RHODIA BUF.TK	IO-FAULT

Diesel engine running but voltage measurement is dropping due to UPS failure

Command given - but response not within acceptable limits

2010/09/23 02:30:26.260 !	P24	6460	CL/PH UNIT IN	CNTRL DISTURB.
2010/09/23 02:30:26.260 !	P02	6991	DG3/4 VISCOSIMETER	CNTRL DISTURB.
2010/09/23 02:30:26.280 **	SYS	AP04	slot02 iorack06	-
2010/09/23 02:30:26.310 **	SYS	B1A1	STATION ON BATTERY	-
2010/09/23 02:30:26.320 !	P11	1189	THRUSTERS SYSTEM	WARNING
2010/09/23 02:30:26.320 !	P02	2204	DG1&2 FUEL PREP.SUC.	NOT AVAILABLE
2010/09/23 02:30:26.320 !	P02	2205	DG3&4 FUEL PREP.SUC.	NOT AVAILABLE
2010/09/23 02:30:26.320 !	P08	428	F.PMP ILT1A EM.POWER	NOT ALIVE
2010/09/23 02:30:26.320 !	P02	5242	FUEL MIXING TK CMM9A	LOW LEVEL
2010/09/23 02:30:26.320 !	P17	6122	LO PURIFIER A GTT6A	FAULT
2010/09/23 02:30:26.320 !	P17	6131	SLUDGE PURIFIER LO	FAULT
2010/09/23 02:30:26.320 !	P17	6132	SLUDGE PURIFIER HFO	FAULT
2010/09/23 02:30:26.320 !	P17	6180	HFO PURIFIER A CCC1A	FAULT
2010/09/23 02:30:26.320 !	P17	6181	HFO PURIFIER B CCC1B	FAULT
2010/09/23 02:30:26.320 !	P17	6183	HFO PURIFIER D CCC1D	FAULT
2010/09/23 02:30:26.320 !	P17	6184	HFO PURIFIER E CCC1E	FAULT
2010/09/23 02:30:26.320 !	P02	6990	DG1/2 VISCOSIMETER	IO-FAULT
2010/09/23 02:30:26.520 !	P10	P_11_012	POD1 CONVERTER 1	FAULT
2010/09/23 02:30:26.520 !	P10	P_11_015	POD1 EXCITATION	FAULT
2010/09/23 02:30:26.520 !	P10	P_11_016	POD1 PROP1 CTRL	FAULT
2010/09/23 02:30:26.520 !	P10	P_12_012	POD1 CONVERTER 2	FAULT
2010/09/23 02:30:26.520 !	P10	P_12_016	POD1 PROP2 CTRL	FAULT
2010/09/23 02:30:26.580 **	SYS	AL13	STATION ON BATTERY	-
2010/09/23 02:30:26.630 !	P16	6381	BW COLLECT UNIT B	FAULT
2010/09/23 02:30:26.690 !	P08	329	MPE POD1 UPS	COMMON ALARM
2010/09/23 02:30:26.700 !	P06	G2_ALMM114	HS1254A LIQ F FW P A	NOT REMOTE
2010/09/23 02:30:26.740 **	SYS	A1A2	STATION HAS STARTED	-
2010/09/23 02:30:26.770 !	P04	1956	GTG1 COMMON PREALARM	ACTIVE
2010/09/23 02:30:26.780 !	P16	6382	BW COLLECT UNIT C	FAULT
2010/09/23 02:30:26.810 !	P08	343	CTRL TELEVISION UPS	COMMON ALARM
2010/09/23 02:30:26.880 !	P16	6380	BW COLLECT UNIT A	FAULT
2010/09/23 02:30:26.910 **	SYS	AL11	DATABACKUP FAULT	-
2010/09/23 02:30:26.960 **	SYS	AP01	slot02 iorack05	-
2010/09/23 02:30:26.980 !	P10	P_21_012	POD2 CONVERTER 1	FAULT
2010/09/23 02:30:26.980 !	P10	P_21_014	POD2 MOTOR	MECHANIC FAULT
2010/09/23 02:30:26.980 !	P10	P_21_015	POD2 EXCITATION	FAULT
2010/09/23 02:30:26.980 !	P10	P_21_016	POD2 PROP1 CTRL	FAULT
2010/09/23 02:30:26.980 !	P10	P_22_012	POD2 CONVERTER 2	FAULT
2010/09/23 02:30:26.980 !	P10	P_22_016	POD2 PROP2 CTRL	FAULT
2010/09/23 02:30:27.020 !	P10	P_31_012	POD3 CONVERTER 1	FAULT
2010/09/23 02:30:27.020 !	P10	P_31_014	POD3 MOTOR	MECHANIC FAULT
2010/09/23 02:30:27.020 !	P10	P_31_015	POD3 EXCITATION	FAULT
2010/09/23 02:30:27.020 !	P10	P_31_016	POD3 PROP1 CTRL	FAULT
2010/09/23 02:30:27.120 !	P08	938	IASUPSC WH UPS 230V	FAILURE
2010/09/23 02:30:27.130 !	P08	473	TR2HT OIL TEMP	IO-FAULT
2010/09/23 02:30:27.130 !	P08	574	TP2F BUSBAR F	IO-FAULT
2010/09/23 02:30:27.190 !	P10	P_41_014	POD4 MOTOR	MECHANIC FAULT
2010/09/23 02:30:27.260 !	P02	1109_S	NO COOLING DG1/2	-
2010/09/23 02:30:27.260 !	P02	1309_S	NO COOLING DG3/4	-
2010/09/23 02:30:27.260 !	P22	2288	EAVAPORATOR 3 INLET	FORCE CLOSE-ACT
2010/09/23 02:30:27.260 !	P16	6384	BW TREATMENT UNIT	CNTRL DISTURB.
2010/09/23 02:30:27.260 !	P08	89	TR4HT OIL LEVEL	ALARM
2010/09/23 02:30:27.310 !	P11	1271	THR2 CONTROL UNIT	CTRL FAILURE
2010/09/23 02:30:27.310 !	P27	1911_S	3 CHILL WATER PUMP	NOT RUNNING
2010/09/23 02:30:27.310 !	P08	365	TR3HT OIL FLOW	LOW FLOW
2010/09/23 02:30:27.410 !	P16	6383	BW COLLECT UNIT D	FAULT
2010/09/23 02:30:27.420 **	SYS	AP02	slot02 iorack04	-
2010/09/23 02:30:27.480 !	P24	3294	EVAPORATOR 2 DAA13A	IO-FAULT
2010/09/23 02:30:27.480 !	P24	3295	EVAPORATOR 3 DAA13B	IO-FAULT
2010/09/23 02:30:27.480 !	P24	3297	EVAPORATOR 2 DAA13A	IO-FAULT
2010/09/23 02:30:27.480 !	P24	3298	EVAPORATOR 3 DAA13B	IO-FAULT
2010/09/23 02:30:27.480 !	P24	4581	SERVICE PPS OUTLET	MEAS. < LL
2010/09/23 02:30:27.480 !	P24	4587	INLET HEATING PW	MEAS. < LL

2010/09/23 02:30:27.480 !	P08	484	RMU3 POWER PFE30	IO-FAULT
2010/09/23 02:30:27.480 !	P08	484_S	RMU3 POWER PFE30	IO-FAULT
2010/09/23 02:30:27.480 !	P24	6078	EVAPORATOR 2 DAA13A	IO-FAULT
2010/09/23 02:30:27.480 !	P17	6166	HFO FILLING TANKS	IO-FAULT
2010/09/23 02:30:27.480 !	P02	6172	DG1/2 FUEL FLOW	IO-FAULT
2010/09/23 02:30:27.480 !	P24	6392	EVAPORATOR 2 DAA13A	IO-FAULT
2010/09/23 02:30:27.480 !	P24	6393	EVAPORATOR 3 DAA13B	IO-FAULT
2010/09/23 02:30:27.480 !	P24	6630	COLD W RECORDER	IO-FAULT
2010/09/23 02:30:27.480 !	P24	6631	COLD W RECORDER	IO-FAULT
2010/09/23 02:30:27.520 **	SYS	AL14	STATION ON BATTERY	-
2010/09/23 02:30:27.520 !	P06	G1_ALMM114	HS1254A LIQ F FW P A	NOT REMOTE
2010/09/23 02:30:27.520 !	P10	P_11_014	POD1 MOTOR	MECHANIC FAULT
2010/09/23 02:30:27.800 !	P02	1215	DG2 TCA VIBRATION	IO-FAULT
2010/09/23 02:30:27.800 !	P02	1217	DG2 TCB VIBRATION	IO-FAULT
2010/09/23 02:30:27.800 !	P02	1315	DG3 TCA VIBRATION	IO-FAULT
2010/09/23 02:30:27.800 !	P02	1317	DG3 TCB VIBRATION	IO-FAULT
2010/09/23 02:30:27.800 !	P02	1413	DG4 ENGINE TORS.VIB.	IO-FAULT
2010/09/23 02:30:27.800 !	P02	1415	DG4 TCA VIBRATION	IO-FAULT
2010/09/23 02:30:27.800 !	P02	1417	DG4 TCB VIBRATION	IO-FAULT
2010/09/23 02:30:27.800 !	P24	3293	EVAPORATOR 1 DAA12	IO-FAULT
2010/09/23 02:30:27.800 !	P24	3296	EVAPORATOR 1 DAA12	IO-FAULT
2010/09/23 02:30:27.800 !	P08	470	TR1HT OIL TEMP	IO-FAULT
2010/09/23 02:30:27.800 !	P08	479	TR4HT OIL TEMP	IO-FAULT
2010/09/23 02:30:27.800 !	P08	570	TP1F BUSBAR F	IO-FAULT
2010/09/23 02:30:27.800 !	P01	6000	DG1 OPACIMETER	IO-FAULT
2010/09/23 02:30:27.800 !	P24	6077	EVAPORATOR 1 DAA12	IO-FAULT
2010/09/23 02:30:27.800 !	P24	6080	EVAPORATORS SALINITY	IO-FAULT
2010/09/23 02:30:27.800 !	P24	6391	EVAPORATOR 1 DAA12	IO-FAULT
2010/09/23 02:30:27.800 !	P24	6461	POST CHLOR.U SNT25	IO-FAULT
2010/09/23 02:30:27.800 !	P14	6670	SEP. QEM24A W.ANALYS	IO-FAULT
2010/09/23 02:30:27.910 !	P04	4110	OUT GT FW PPS	MEAS. < LL
2010/09/23 02:30:27.910 !	P10	4130	OUT PROPUL.FW PPS PS	MEAS. < LL
2010/09/23 02:30:27.910 --	P22	4362	PS PODS SW PPS DISCH	MEAS. < LL
2010/09/23 02:30:27.950 !	P08	257	TP11F LV CB QF1112P	DISTURBANCE
2010/09/23 02:30:27.950 !	P08	258	TP11F LV CB QF11	DISTURBANCE
2010/09/23 02:30:27.950 !	P08	300	TP12F LV CB QF12	DISTURBANCE
2010/09/23 02:30:27.950 !	P08	306	TP2F LV CB QF2	DISTURBANCE
2010/09/23 02:30:27.950 !	P08	85	TR2HT OIL LEVEL	ALARM
2010/09/23 02:30:27.990 --	P20	1510	FIRE BLR F.PP AAA5A	NO STBY PUMP
2010/09/23 02:30:28.040 !	P14	2343	MB PP SUC.QQQ31B	DISTURBANCE
2010/09/23 02:30:28.260 !	P22	2286	EVAPORATOR 2 INLET	FORCE CLOSE-ACT
2010/09/23 02:30:28.260 !	P08	303	TP1F LV CB QF1	DISTURBANCE
2010/09/23 02:30:28.260 !	P08	310	TP4F LV CB QF4	DISTURBANCE
2010/09/23 02:30:28.260 !	P08	83	TR1HT OIL LEVEL	ALARM
2010/09/23 02:30:28.310 !	P11	1171	THR1 CONTROL UNIT	CTRL FAILURE
2010/09/23 02:30:28.310 !	P11	1371	THR3 CONTROL UNIT	CTRL FAILURE
2010/09/23 02:30:28.310 !	P22	2284	EVAPORATOR 1 INLET	FORCE CLOSE-ACT
2010/09/23 02:30:28.310 !	P14	2354	MB DRAIN QAA2C	DISTURBANCE
2010/09/23 02:30:28.310 !	P14	2361	MB PP SUC. QQQ31A	DISTURBANCE
2010/09/23 02:30:28.310 !	P14	2365	MB PIPE ISOL.	DISTURBANCE
2010/09/23 02:30:28.310 !	P08	308	TP3F LV CB QF3	DISTURBANCE
2010/09/23 02:30:28.310 !	P08	87	TR3HT OIL LEVEL	ALARM
2010/09/23 02:30:28.340 !	P08	399	TP1HT PROTECT RELAY	FAULT
2010/09/23 02:30:28.500 **	SYS	AB01	STATION NO RESPONSE	-
2010/09/23 02:30:28.550 --	P31	794	FIRE CABINET DK1	ENG.FIRE ALARM
2010/09/23 02:30:28.620 **	SYS	AP02	slot02 iorack04	-
2010/09/23 02:30:28.700 !	P06	G2_ALMM115	HS1254B LIQ F FW P B	NOT REMOTE
2010/09/23 02:30:28.740 **	P31	791	FIRE CABINET DK12	ENG.FIRE ALARM
2010/09/23 02:30:28.760 **	SYS	AL08	RSU6 slot04	-
2010/09/23 02:30:28.810 **	SYS	AP04	slot02 iorack06	
2010/09/23 02:30:28.910 **	SYS	AL17	slot06	
2010/09/23 02:30:28.910 **	SYS	AP03	slot01 R	-
2010/09/23 02:30:29.040 !	P14	2345	MB PP DIS.SEA QQQ31B	DISTURBANCE

Breaker status has changed without command from IAS

2010/09/23 02:30:29.190 !	P09	P_41_051	POD4 STEER CTRL	FAULT
2010/09/23 02:30:29.300 !	P08	301	TP1F LV CB QF1200F	DISTURBANCE
2010/09/23 02:30:29.300 !	P08	309	TP4F LV CB QF3400S	DISTURBANCE
2010/09/23 02:30:29.320 **	SYS	AB02	STATION NO RESPONSE	-
2010/09/23 02:30:29.330 !	P14	2349	MB PIPE ISOL.	DISTURBANCE
2010/09/23 02:30:29.420 !	P24	1627	CIRC. HOT W PP EDT2	FORCE OFF-ACT
2010/09/23 02:30:29.520 !	P08	476	TR3HT OIL TEMP	IO-FAULT
2010/09/23 02:30:29.520 !	P06	G1_ALMM115	HS1254B LIQ F FW P B	NOT REMOTE
2010/09/23 02:30:29.800 !	P10	1770	PROPUL.FW PP SLL1A	DISTURBANCE
2010/09/23 02:30:29.800 !	P22	1797	SB PODS SW PP SSS10A	DISTURBANCE
2010/09/23 02:30:30.010 !	P27	4834	OUT PPS VFEP	MEAS. < LL
2010/09/23 02:30:30.010 !	P27	4835	HOT WTR CIRC PPS OUT	MEAS. < LL
2010/09/23 02:30:30.040 !	P14	2346	MB PP DIS.SEA QQQ31A	DISTURBANCE
2010/09/23 02:30:30.190 !	P10	P_41_013	POD4 MOTOR	ELECTRIC FAULT
2010/09/23 02:30:30.320 !	P14	1730	BILGE PIST.PP QQQ31A	DISTURBANCE
2010/09/23 02:30:30.320 !	P14	1732	LOW D.BILGE PP QQQ3A	DISTURBANCE
2010/09/23 02:30:30.320 !	P14	1733	LOW D.BILGE PP QQQ3B	DISTURBANCE
2010/09/23 02:30:30.520 !	P10	P_11_013	POD1 MOTOR	ELECTRIC FAULT
2010/09/23 02:30:30.530 !	P10	1773	PROPUL.FW PP SLL1D	DISTURBANCE
2010/09/23 02:30:30.530 !	P22	1799	PS PODS SW PP SSS10C	DISTURBANCE
2010/09/23 02:30:30.980 !	P10	P_21_013	POD2 MOTOR	ELECTRIC FAULT
2010/09/23 02:30:31.020 !	P10	P_31_013	POD3 MOTOR	ELECTRIC FAULT
2010/09/23 02:30:31.050 !	P14	1731	BILGE PIST.PP QQQ31B	DISTURBANCE
2010/09/23 02:30:31.110 !	P10	1771	PROPUL.FW PP SLL1B	STBY START
2010/09/23 02:30:31.110 !	P22	1798	SB PODS SW PP SSS10B	STBY START
2010/09/23 02:30.31.290 !	P13	1651	FIRE PUMP ILT1B	NOT AVAILABLE
2010/09/23 02:30:31.290 !	P16	GWCONFFAULT	GW CONFIGURAT. FAULT	ALARM
2010/09/23 02:30:31.780 !	P24	1568	HYD. PUMP DAA35A	DISTURBANCE
2010/09/23 02:30:31.780 !	P16	1574	GW PUMP DGT10A	DISTURBANCE
2010/09/23 02:30:31.780 !	P02	3373	DG1/2 ST.BY LT FW PP	DISTURBANCE
2010/09/23 02:30:31.820 !	P16	1580	GW PUMP DGT30A	DISTURBANCE
2010/09/23 02:30:31.820 !	P10	1772	PROPUL.FW PP SLL1C	STBY START
2010/09/23 02:30:31.820 !	P22	1800	PS PODS SW PP SSS10D	STBY START
2010/09/23 02:30:31.900 !	P24	1569	HYD. PUMP DAA35B	DISTURBANCE
2010/09/23 02:30:31.900 !	P16	1578	GW PUMP DGT20A	DISTURBANCE
2010/09/23 02:30:31.900 !	P02	3374	DG3/4 ST.BY LT FW PP	DISTURBANCE
2010/09/23 02:30:31.980 !	P02	D_41_PT451	DG4 LT W.PR. ENG.INL	MEAS. < LL
2010/09/23 02:30:32.030 !	P30	929	AUTO TELE.DK6 UPS	COMMON ALARM
2010/09/23 02:30:32.040 !	P29	1248	HANDICAP LIFT 5	ALARM CALL
2010/09/23 02:30:32.240 !	P30	927	AUTO TELE.DK5 UPS	COMMON ALARM
2010/09/23 02:30:33.020 **	SYS	AP04	slot02 iorack06	IO-DISTURBANCE CARD 5
2010/09/23 02:30:33.150 !	P08	518	TP1HT DG2 ACTIVE	IO-FAULT
2010/09/23 02:30:33.190 !	P02	D_31_PT451	DG3 LT W.PR. ENG.INL	MEAS. < LL
2010/09/23 02:30:33.290 !	P13	6911	HI-FOG UNIT C	PUMP UNIT FAULT
2010/09/23 02:30:33.440 !	P08	1442	HARM.F.HF2MPE RK11.3	MEAS. > HL
2010/09/23 02:30:33.570 !	P02	1225	DIESEL GENERATOR 2	LOADSH. FAILED
2010/09/23 02:30:33.640 **	SYS	AP04	slot02 iorack06	IO-DISTURBANCE CARD 9
2010/09/23 02:30:33.980 !	P02	D_41_PT101	DG4 FO INLET PRESS.	MEAS. < LL
2010/09/23 02:30:34.470 !	P02	D_21_PT401	DG2 HT WATER INL PR.	MEAS. > HL
2010/09/23 02:30:34.790 !	P02	D_11_PT201B	DG1 LO ENG. INL PR.	START BLOCKING
2010/09/23 02:30:42.660 --	P08	346	W/H UPS	COMMON ALARM
2010/09/23 02:32:04.940 !	P20	6050	DRAIN OBSERVATION TK	DISTURBANCE
2010/09/23 02:32:07.040 !	P10	6596	CONVERTER 2 POD4	LOW FLOW
2010/09/23 02:32:09.250 !	P27	C_2_SLFA11	GTW 8 CH.3 ID 11	SER.LINE FAULT
2010/09/23 02:32:09.250 !	P27	C_3_SLFA12	GTW 8 CH.3 ID 12	SER.LINE FAULT
2010/09/23 02:32:09.250 !	P27	C_5_SLFA14	GTW 8 CH.3 ID 14	SER.LINE FAULT
2010/09/23 02:32:29.300 !	P22	2286	EVAPORATOR 2 INLET	DISTURBANCE
2010/09/23 02:32:37.330 !	P27	3262	EXCHANGER HVAC VFCX1	MEAS. > HL
2010/09/23 02:32:38.350 !	P02	1222	DG2 LOAD RED.REQUEST	ACTIVE
2010/09/23 02:32:38.470 **	P01	D_21_QS701	DG2 OIL MIST IN CRAN	SHUTDOWN
2010/09/23 02:32:39.470 !	P02	D_21_QS700	DG2 OIL MIST DETECT.	ALARM
2010/09/23 02:32:46.520 !	P09	P_11_053	POD1 STEERING	MECHANIC FAULT
2010/09/23 02:32:46.520 !	P09	P_12_053	POD1 STEERING	MECHANIC FAULT

2010/09/23 02:32:46.980 !	P09	P_21_053	POD2 STEERING	MECHANIC FAULT
2010/09/23 02:32:46.980 !	P09	P_22_053	POD2 STEERING	MECHANIC FAULT
2010/09/23 02:32:47.220 !	P09	P_31_053	POD3 STEERING	MECHANIC FAULT
2010/09/23 02:33:00.420 --	P31	795	FIRE CABINET DK1	ACCO.FIRE ALARM
2010/09/23 02:33:02.320 --	P31	791_A	ENGINE ROOM	FIRE ALARM
2010/09/23 02:33:08.280 !	P23	3641	AIR DRYER KAA3B	HIGH TEMP.
2010/09/23 02:33:17.570 !	P27	3267	OUT HVAC EX.VFPX1	MEAS. > HL
2010/09/23 02:33:24.320 !	P18	2755	F.PAS.POOL BUF.TK IN	DISTURBANCE
2010/09/23 02:33:28.310 --	P18	2755	F.PAS.POOL BUF.TK IN	DISTURBANCE
2010/09/23 02:33:29.310 !	P02	1327	DG3 STAND-BY	AND DG BLOCKED
2010/09/23 02:33:30.950 !	P18	2662	A.POOL DK8 BUF.TK IN	DISTURBANCE
2010/09/23 02:33:31.300 !	P02	1227	DG2 STAND-BY	AND DG BLOCKED
2010/09/23 02:33:32.610 --	P08	1585	TP6F BUS BAR	DISCREPANCY
2010/09/23 02:33:32.670 --	P08	1591	TP8F BUS BAR	DISCREPANCY
2010/09/23 02:33:34.080 --	P02	D_31_NS711	DG3 RELAY MODULE	COMMON ALARM
2010/09/23 02:33:34.090 !	P18	5630	A.POOL DK8 BUFFER TK	IO-FAULT
2010/09/23 02:33:34.120 --	P18	6925	F.PAS.POOL HEAT.OUT.	LOW FLOW
2010/09/23 02:33:34.170 --	P19	1878	INCINERATOR R.VEM77	DISTURBANCE
2010/09/23 02:33:34.630 --	P02	D_42_PT155A	DG4 RAIL.PR.ACC.FE/A	DIFF.TO SETP.
2010/09/23 02:33:34.730 --	P02	1422	DG4 LOAD RED.REQUEST	ACTIVE
2010/09/23 02:33:34.980 --	P02	D_21_NS711	DG2 RELAY MODULE	COMMON ALARM
2010/09/23 02:33:38.910 --	SYS	AL16	slot06	-
2010/09/23 02:33:39.130 --	P10	1772	PROPUL.FW PP SLL1C	STBY START
2010/09/23 02:33:39.200 --	P22	1800	PS PODS SW PP SSS10D	STBY START
2010/09/23 02:33:39.260 --	SYS	AL06	STATION ON BATTERY	-
2010/09/23 02:33:39.420 --	SYS	AL12	STATION ON BATTERY	
2010/09/23 02:33:39.500 --	P02	D_41_PT451	DG4 LT W.PR. ENG.INL	MEAS. < LL
2010/09/23 02:33:39.560 --	P30	929	AUTO TELE.DK6 UPS	COMMON ALARM
2010/09/23 02:33:39.640 --	P30	927	AUTO TELE.DK5 UPS	COMMON ALARM
2010/09/23 02:33:39.730 --	SYS	AL15	STATION ON BATTERY	-
2010/09/23 02:33:39.790 --	SYS	AP04	slot02 iorack06	IO-DISTURBANCE CARD 19
2010/09/23 02:33:39.830 --	P13	6901	HI-FOG UNIT A	PUMP UNIT FAULT
2010/09/23 02:33:39.890 --	SYS	AP04	slot02 iorack06	IO-DISTURBANCE CARD 5
2010/09/23 02:33:40.040 --	P08	518	TP1HT DG2 ACTIVE	IO-FAULT
2010/09/23 02:33:40.090 --	P02	D_31_PT451	DG3 LT W.PR. ENG.INL	MEAS. < LL
2010/09/23 02:33:40.150 --	P13	6911	HI-FOG UNIT C	PUMP UNIT FAULT
2010/09/23 02:33:40.240 --	P02	1225	DIESEL GENERATOR 2	LOADSH. FAILED
2010/09/23 02:33:40.290 --	SYS	AP04	slot02 iorack06	IO-DISTURBANCE CARD 9
2010/09/23 02:33:56.070 **	P31	796	FIRE CABINET DK1	FAILURE
2010/09/23 02:34:00.550 !	P27	C_1_SLFA10	GTW 8 CH.3 ID 10	SER.LINE FAULT
2010/09/23 02:34:34.040 !	P18	POOLB	POOL AFT 8 CONTROL	FAILURE
2010/09/23 02:34:37.130 !	P30	931	CTRL TELEVISION DK1	FAULT
2010/09/23 02:34:37.130 !	P30	935	CTRL TELEVISION DK2	FAULT
2010/09/23 02:34:42.810 !	P30	932	CTRL TELEVISION1 DK6	FAULT
2010/09/23 02:34:42.810 !	P30	933	CTRL TELEVISION2 DK6	FAULT
2010/09/23 02:34:48.040 --	P20	3284	ATMOSPHERIC HOTWELL	MEAS. > HL
2010/09/23 02:34:49.510 !	P27	5933	HVAC CHIL W EXP.TK	HIGH LEVEL
2010/09/23 02:35:44.930 --	SYS	AP01	slot02 iorack05	-
2010/09/23 02:35:45.170 --	P22	1799	PS PODS SW PP SSS10C	DISTURBANCE
2010/09/23 02:35:45.230 --	SYS	AP03	slot01 R	-
2010/09/23 02:35:45.390 --	P22	1798	SB PODS SW PP SSS10B	STBY START
2010/09/23 02:35:45.440 --	P10	1771	PROPUL.FW PP SLL1B	STBY START
2010/09/23 02:35:45.490 --	P02	1303	DG3 WOODWARD 723	MINOR ALARM
2010/09/23 02:35:45.540 --	P02	D_41_PT101	DG4 FO INLET PRESS.	MEAS. < LL
2010/09/23 02:35:48.810 --	P14	2345	MB PP DIS.SEA QQQ31B	DISTURBANCE
2010/09/23 02:35:48.880 --	SYS	AL09	STATION NO RESPONSE	-
2010/09/23 02:35:49.030 --	SYS	AB02	STATION NO RESPONSE	-
2010/09/23 02:35:49.090 --	P14	2349	MB PIPE ISOL.	DISTURBANCE
2010/09/23 02:35:49.100 !	P24	3709	OUT HEATING PW UNIT	MEAS. < LL
2010/09/23 02:35:49.220 --	P08	476	TR3HT OIL TEMP	IO-FAULT
2010/09/23 02:35:49.430 --	P14	2346	MB PP DIS.SEA QQQ31A	DISTURBANCE
2010/09/23 02:36:12.320 !	P02	6990	DG1/2 VISCOSIMETER	MEAS. < LL
2010/09/23 02:36:27.950 !	P18	2732	A.POOL DK6 BUF.TK IN	DISTURBANCE

2010/09/23 02:36:38.040 --	P18	POOLB	POOL AFT 8 CONTROL	FAILURE
2010/09/23 02:36:41.910 --	P13	6908	HI-FOG UNIT B	H.F. ACTIVATED
2010/09/23 02:36:41.930 --	P13	6903	HI-FOG UNIT A	H.F. ACTIVATED
2010/09/23 02:36:41.930 --	P13	6913	HI-FOG UNIT C	H.F. ACTIVATED
2010/09/23 02:36:41.980 !	P13	6901	HI-FOG UNIT A	PUMP UNIT FAULT
2010/09/23 02:36:41.980 --	P13	6904	HI-FOG UNIT A	PUMP UNIT RUN.
2010/09/23 02:36:41.980 --	P13	6914	HI-FOG UNIT C	PUMP UNIT RUN.
2010/09/23 02:36:43.620 --	P13	6901	HI-FOG UNIT A	PUMP UNIT FAULT
2010/09/23 02:37:06.900 !	P18	5632	A.POOL DK6 BUFFER TK	IO-FAULT
2010/09/23 02:37:06.950 !	P18	2651	A.POOL DK8 BUF.TK OU	DISTURBANCE
2010/09/23 02:37:30.040 !	P18	POOLA	POOL AFT 6 CONTROL	FAILURE
2010/09/23 02:38:00.340 !	P13	6913	HI-FOG UNIT C	H.F. ACTIVATED
2010/09/23 02:38:00.600 !	P13	6908	HI-FOG UNIT B	H.F. ACTIVATED
2010/09/23 02:38:01.570 !	P13	6903	HI-FOG UNIT A	H.F. ACTIVATED
2010/09/23 02:38:01.640 !	P13	6904	HI-FOG UNIT A	PUMP UNIT RUN.
2010/09/23 02:38:06.860 !	P13	6909	HI-FOG UNIT B	PUMP UNIT RUN.
2010/09/23 02:38:20.320 !	P18	2755	F.PAS.POOL BUF.TK IN	DISTURBANCE
2010/09/23 02:38:26.260 --	P02	1127	DG1 STAND-BY	AND DG BLOCKED
2010/09/23 02:38:27.670 --	P13	6908	HI-FOG UNIT B	H.F. ACTIVATED
2010/09/23 02:38:27.680 --	P13	6903	HI-FOG UNIT A	H.F. ACTIVATED
2010/09/23 02:38:27.680 --	P13	6913	HI-FOG UNIT C	H.F. ACTIVATED
2010/09/23 02:38:27.720 --	P13	6904	HI-FOG UNIT A	PUMP UNIT RUN.
2010/09/23 02:38:27.720 --	P13	6909	HI-FOG UNIT B	PUMP UNIT RUN.
2010/09/23 02:38:46.310 !	P14	5402	MB EVAP.ROOM	FLOODING
2010/09/23 02:39:20.330 !	P18	POOLD	FWD POOL 7 CONTROL	FAILURE
2010/09/23 02:39:23.430 !	P20	4014	BOILER STEAM INLET	MEAS. < LL
2010/09/23 02:39:31.700 !	P18	5634	A.PAS.POOL BUFFER TK	IO-FAULT
2010/09/23 02:39:35.050 --	P18	POOLA	POOL AFT 6 CONTROL	FAILURE
2010/09/23 02:39:41.720 !	P18	5636	F.PAS.POOL BUFFER TK	IO-FAULT
2010/09/23 02:39:42.410 !	P13	6913	HI-FOG UNIT C	H.F. ACTIVATED
2010/09/23 02:39:42.590 !	P13	6908	HI-FOG UNIT B	H.F. ACTIVATED
2010/09/23 02:39:43.030 !	P13	6903	HI-FOG UNIT A	H.F. ACTIVATED
2010/09/23 02:39:43.090 !	P13	6904	HI-FOG UNIT A	PUMP UNIT RUN.
2010/09/23 02:39:46.320 !	P18	2747	A.PAS.POOL BUF.TK IN	DISTURBANCE
2010/09/23 02:39:48.750 !	P13	6909	HI-FOG UNIT B	PUMP UNIT RUN.
2010/09/23 02:39:56.790 !	P02	D_11_PT451	DG1 LT W.PR. ENG.INL	MEAS. < LL
2010/09/23 02:40:01.120 !	P02	1121	DG1 COMMON ALARM	ACTIVE
2010/09/23 02:40:02.940 !	P18	2721	A.POOL DK6 BUF.TK OU	DISTURBANCE

End of alarm list: 532 alarms returned

	EVENTS		Time UTC (as per P1200 clock)										
	Horodate	Lib Evt	Libellé	Valeur	Infos	Type Evt	Tag	Nom	Domaine	Nature	Priorité	Poste	Opérateu	Remarque
1	23/09/2010 01:48:12	Etat à 1	Half drive alarm lamp	1		512		PROP_P3.HD2.RBANNER.ALARM	PORT3_HD2			2		
2	23/09/2010 01:55:09	Etat à 1	Drainage pump 1 ON	1		512		PROP_P3.HD2.DRAIN.PUMP1.ON	PORT3_HD2			2		
3	23/09/2010 01:55:09	Etat à 1	Drainage pump 1 ON	1		512		PROP_P3.HD1.DRAIN.PUMP1.ON	PORT3_HD1			2		
4	23/09/2010 01:56:42	Etat à 1	Half drive alarm lamp	1		512		PROP_P3.HD2.RBANNER.ALARM	PORT3_HD2			2		
5	23/09/2010 01:57:10	Etat à 0	Drainage pump 1 ON			64		PROP_P3.HD2.DRAIN.PUMP1.ON	PORT3_HD2			2		
6	23/09/2010 01:57:10	Etat à 0	Drainage pump 1 ON			64		PROP_P3.HD1.DRAIN.PUMP1.ON	PORT3_HD1			2		
7	23/09/2010 01:57:13	Etat à 1	VP3 open (void space position)	1		512		PROP_P3.HD2.MERMAID.VP3.OPEN	PORT3_HD2			2		
8	23/09/2010 01:57:13	Etat à 1	VP3 open (void space position)	1		512		PROP_P3.HD1.MERMAID.VP3.OPEN	PORT3_HD1			2		
9	23/09/2010 01:57:14	Etat à 1	Drainage pump 2 priority	1		512		PROP_P3.HD2.DRAIN.PUMP.PRIORITY2	PORT3_HD2			2		
11	23/09/2010 01:57:14	Etat à 1	Drainage pump 2 priority	1		512		PROP_P3.HD1.DRAIN.PUMP.PRIORITY2	PORT3_HD1			2		
10	23/09/2010 01:57:14	524288	POD Calculating leak flow high alarm	3		524288		PROP_P3.HD1.FROMPEC_S.SFT0300	PORT3_HD1		1	2		
12	23/09/2010 01:57:44	524288	POD Calculating leak flow high alarm	3		524288		PROP_P3.HD2.FROMPEC_S.SFT0300	PORT3_HD2		1	2		
13	23/09/2010 02:05:43	Etat à 1	Half drive alarm lamp	1		512		PROP_P3.HD2.RBANNER.ALARM	PORT3_HD2			2		
14	23/09/2010 02:06:54	Etat à 1	Half drive alarm lamp	1		512		PROP_P3.HD2.RBANNER.ALARM	PORT3_HD2			2		
17	23/09/2010 02:08:38	Acquittem	C alarm by POD steering	2		65536		PROP_P3.HD2.FROMPEC.FLT1040	PORT3_HD2		1	4	ALSTOM	
15	23/09/2010 02:08:38	Acquittem	POD Calculating leak flow high alarm	2		65536		PROP_P3.HD2.FROMPEC_S.SFT0300	PORT3_HD2		1	4	ALSTOM	
16	23/09/2010 02:08:38	Acquittem	POD Calculating leak flow high alarm	2		65536		PROP_P3.HD1.FROMPEC_S.SFT0300	PORT3_HD1		1	4	ALSTOM	
18	23/09/2010 02:08:51	262144	POD Calculating leak flow high alarm	4		262144		PROP_P3.HD1.FROMPEC_S.SFT0300	PORT3_HD1		1	2		
19	23/09/2010 02:08:52	262144	POD Calculating leak flow high alarm	4		262144		PROP_P3.HD2.FROMPEC_S.SFT0300	PORT3_HD2		1	2		
22	23/09/2010 02:25:24	524288	C motor limitation by voltage	3		524288		PROP_S2.HD1.FROMPEC.FLT1028	STBD2_HD1		1	2		
21	23/09/2010 02:25:24	524288	E undervoltage	3		524288		PROP_S2.HD1.FROMPEC.FLT0354	STBD2_HD1		1	2		
24	23/09/2010 02:25:24	Etat à 1	generating mode	1		512		PROP_S2.HD1.GENEMODE.ON	STBD2_HD1			2		
23	23/09/2010 02:25:24	Etat à 1	Half drive alarm lamp	1		512		PROP_S2.HD1.RBANNER.ALARM	STBD2_HD1			2		
20	23/09/2010 02:25:24	524288	NB undervoltage	3		524288		PROP_S2.HD1.FROMPEC.FLT0212	STBD2_HD1		1	2		
28	23/09/2010 02:25:24	Etat à 0	Air dryer ON			64		PROP_P1.HD2.AIR_DRIER.ON	PORT1_HD2			2		
26	23/09/2010 02:25:24	524288	C motor limitation by voltage	3		524288		PROP_P1.HD2.FROMPEC.FLT1028	PORT1_HD2		1	2		
27	23/09/2010 02:25:24	Etat à 1	Half drive alarm lamp	1		512		PROP_P1.HD2.RBANNER.ALARM	PORT1_HD2			2		
25	23/09/2010 02:25:24	524288	NB undervoltage	3		524288		PROP_P1.HD2.FROMPEC.FLT0212	PORT1_HD2		1	2		
33	23/09/2010 02:25:24	Etat à 0	Air dryer ON			64		PROP_P3.HD2.AIR_DRIER.ON	PORT3_HD2			2		
30	23/09/2010 02:25:24	524288	C motor limitation by frequency	3		524288		PROP_P3.HD2.FROMPEC.FLT1027	PORT3_HD2		1	2		
31	23/09/2010 02:25:24	524288	C motor limitation by voltage	3		524288		PROP_P3.HD2.FROMPEC.FLT1028	PORT3_HD2		1	2		
32	23/09/2010 02:25:24	524288	M POD monitoring system FT	3		524288		PROP_P3.HD2.SL.STERN_PP1.FAULT	PORT3_HD2		1	2		
29	23/09/2010 02:25:24	524288	NB undervoltage	3		524288		PROP_P3.HD2.FROMPEC.FLT0212	PORT3_HD2		1	2		
66	23/09/2010 02:25:24	Etat à 0	Air dryer ON			64		PROP_P3.HD1.AIR_DRIER.ON	PORT3_HD1			2		
36	23/09/2010 02:25:24	524288	C motor limitation by frequency	3		524288		PROP_P3.HD1.FROMPEC.FLT1027	PORT3_HD1		1	2		
37	23/09/2010 02:25:24	524288	C motor limitation by voltage	3		524288		PROP_P3.HD1.FROMPEC.FLT1028	PORT3_HD1		1	2		
38	23/09/2010 02:25:24	524288	C switchboard supply loss	3		524288		PROP_P3.HD1.FROMPEC.FLT1043	PORT3_HD1		1	2		
63	23/09/2010 02:25:24	Etat à 0	Converter pump 1 ON			64		PROP_P3.HD1.CONV_NB.DEION_PP1.ON	PORT3_HD1			2		
35	23/09/2010 02:25:24	524288	E undervoltage	3		524288		PROP_P3.HD1.FROMPEC.FLT0354	PORT3_HD1		1	2		
64	23/09/2010 02:25:24	Etat à 0	Lub DE pump 1 ON			64		PROP_P3.HD1.MOTOR.DE_PP1.ON	PORT3_HD1			2		
65	23/09/2010 02:25:24	Etat à 0	Lub NDE pump 1 ON			64		PROP_P3.HD1.MOTOR.NDE_PP1.ON	PORT3_HD1			2		
39	23/09/2010 02:25:24	524288	M POD monitoring system FT	3		524288		PROP_P3.HD1.SL.STERN_PP1.FAULT	PORT3_HD1		1	2		
34	23/09/2010 02:25:24	524288	NB undervoltage	3		524288		PROP_P3.HD1.FROMPEC.FLT0212	PORT3_HD1		1	2		
62	23/09/2010 02:25:24	Etat à 0	Transfo auxil 1 ON			64		PROP_P3.HD1.TRANSF1.AUX1.ON	PORT3_HD1			2		
84	23/09/2010 02:25:25	Etat à 0	Air dryer ON			64		PROP_S4.HD1.AIR_DRIER.ON	STBD4_HD1			2		
42	23/09/2010 02:25:25	524288	C motor limitation by frequency	3		524288		PROP_S4.HD1.FROMPEC.FLT1027	STBD4_HD1		1	2		
43	23/09/2010 02:25:25	524288	C motor limitation by voltage	3		524288		PROP_S4.HD1.FROMPEC.FLT1028	STBD4_HD1		1	2		
44	23/09/2010 02:25:25	524288	C switchboard supply loss	3		524288		PROP_S4.HD1.FROMPEC.FLT1043	STBD4_HD1		1	2		
81	23/09/2010 02:25:25	Etat à 0	Converter pump 1 ON			64		PROP_S4.HD1.CONV_NB.DEION_PP1.ON	STBD4_HD1			2		

41	23/09/2010 02:25:25	524288	E undervoltage	3	524288	PROP_S4.HD1.FROMPEC.FLT0354	STBD4_HD1	1	2
79	23/09/2010 02:25:25	Etat à 1	generating mode	1	512	PROP_S4.HD1.GENEMODE.ON	STBD4_HD1		2
75	23/09/2010 02:25:25	Etat à 1	Half drive alarm lamp	1	512	PROP_S4.HD1.RBANNER.ALARM	STBD4_HD1		2
82	23/09/2010 02:25:25	Etat à 0	Lub DE pump 1 ON		64	PROP_S4.HD1.MOTOR.DE_PP1.ON	STBD4_HD1		2
83	23/09/2010 02:25:25	Etat à 0	Lub NDE pump 1 ON		64	PROP_S4.HD1.MOTOR.NDE_PP1.ON	STBD4_HD1		2
45	23/09/2010 02:25:25	524288	M POD monitoring system FT	3	524288	PROP_S4.HD1.SL.STERN_PP1.FAULT	STBD4_HD1	1	2
40	23/09/2010 02:25:25	524288	NB undervoltage	3	524288	PROP_S4.HD1.FROMPEC.FLT0212	STBD4_HD1	1	2
80	23/09/2010 02:25:25	Etat à 0	Transfo auxil 1 ON		64	PROP_S4.HD1.TRANSF1.AUX1.ON	STBD4_HD1		2
101	23/09/2010 02:25:25	Etat à 0	Air dryer ON		64	PROP_S4.HD2.AIR_DRIER.ON	STBD4_HD2		2
47	23/09/2010 02:25:25	524288	C motor limitation by frequency	3	524288	PROP_S4.HD2.FROMPEC.FLT1027	STBD4_HD2	1	2
48	23/09/2010 02:25:25	524288	C motor limitation by voltage	3	524288	PROP_S4.HD2.FROMPEC.FLT1028	STBD4_HD2	1	2
49	23/09/2010 02:25:25	524288	C switchboard supply loss	3	524288	PROP_S4.HD2.FROMPEC.FLT1043	STBD4_HD2	1	2
96	23/09/2010 02:25:25	Etat à 1	generating mode	1	512	PROP_S4.HD2.GENEMODE.ON	STBD4_HD2		2
95	23/09/2010 02:25:25	Etat à 1	Half drive alarm lamp	1	512	PROP_S4.HD2.RBANNER.ALARM	STBD4_HD2		2
50	23/09/2010 02:25:25	524288	M POD monitoring system FT	3	524288	PROP_S4.HD2.SL.STERN_PP1.FAULT	STBD4_HD2	1	2
46	23/09/2010 02:25:25	524288	NB undervoltage	3	524288	PROP_S4.HD2.FROMPEC.FLT0212	STBD4_HD2	1	2
113	23/09/2010 02:25:25	Etat à 0	Air dryer ON		64	PROP_S2.HD2.AIR_DRIER.ON	STBD2_HD2		2
52	23/09/2010 02:25:25	524288	C motor limitation by frequency	3	524288	PROP_S2.HD2.FROMPEC.FLT1027	STBD2_HD2	1	2
53	23/09/2010 02:25:25	524288	C motor limitation by voltage	3	524288	PROP_S2.HD2.FROMPEC.FLT1028	STBD2_HD2	1	2
54	23/09/2010 02:25:25	524288	C switchboard supply loss	3	524288	PROP_S2.HD2.FROMPEC.FLT1043	STBD2_HD2	1	2
105	23/09/2010 02:25:25	Etat à 1	generating mode	1	512	PROP_S2.HD2.GENEMODE.ON	STBD2_HD2		2
104	23/09/2010 02:25:25	Etat à 1	Half drive alarm lamp	1	512	PROP_S2.HD2.RBANNER.ALARM	STBD2_HD2		2
55	23/09/2010 02:25:25	524288	M POD monitoring system FT	3	524288	PROP_S2.HD2.SL.STERN_PP1.FAULT	STBD2_HD2	1	2
108	23/09/2010 02:25:25	Etat à 0	Motor fan 1 ON		64	PROP_S2.HD2.MOTOR.FAN 1.ON	STBD2_HD2		2
51	23/09/2010 02:25:25	524288	NB undervoltage	3	524288	PROP_S2.HD2.FROMPEC.FLT0212	STBD2_HD2	1	2
58	23/09/2010 02:25:25	524288	C motor limitation by frequency	3	524288	PROP_P1.HD1.FROMPEC.FLT1027	PORT1_HD1	1	2
59	23/09/2010 02:25:25	524288	C motor limitation by voltage	3	524288	PROP_P1.HD1.FROMPEC.FLT1028	PORT1_HD1	1	2
60	23/09/2010 02:25:25	524288	C switchboard supply loss	3	524288	PROP_P1.HD1.FROMPEC.FLT1043	PORT1_HD1	1	2
57	23/09/2010 02:25:25	524288	E undervoltage	3	524288	PROP_P1.HD1.FROMPEC.FLT0354	PORT1_HD1	1	2
61	23/09/2010 02:25:25	524288	M POD monitoring system FT	3	524288	PROP_P1.HD1.SL.STERN_PP1.FAULT	PORT1_HD1	1	2
56	23/09/2010 02:25:25	524288	NB undervoltage	3	524288	PROP_P1.HD1.FROMPEC.FLT0212	PORT1_HD1	1	2
123	23/09/2010 02:25:25	Etat à 0	Air dryer ON		64	PROP_P1.HD1.AIR_DRIER.ON	PORT1_HD1		2
118	23/09/2010 02:25:25	Etat à 1	Half drive alarm lamp	1	512	PROP_P1.HD1.RBANNER.ALARM	PORT1_HD1		2
119	23/09/2010 02:25:25	Etat à 0	Motor fan 1 ON		64	PROP_P1.HD1.MOTOR.FAN 1.ON	PORT1_HD1		2
135	23/09/2010 02:25:25	Etat à 0	Air dryer ON		64	PROP_S2.HD1.AIR_DRIER.ON	STBD2_HD1		2
71	23/09/2010 02:25:25	524288	C motor limitation by frequency	3	524288	PROP_S2.HD1.FROMPEC.FLT1027	STBD2_HD1	1	2
72	23/09/2010 02:25:25	262144	C motor limitation by voltage	5	262144	PROP_S2.HD1.FROMPEC.FLT1028	STBD2_HD1	1	2
73	23/09/2010 02:25:25	524288	C switchboard supply loss	3	524288	PROP_S2.HD1.FROMPEC.FLT1043	STBD2_HD1	1	2
74	23/09/2010 02:25:25	524288	M POD monitoring system FT	3	524288	PROP_S2.HD1.SL.STERN_PP1.FAULT	STBD2_HD1	1	2
134	23/09/2010 02:25:25	Etat à 0	Motor fan 1 ON		64	PROP_S2.HD1.MOTOR.FAN 1.ON	STBD2_HD1		2
67	23/09/2010 02:25:25	524288	C motor limitation by frequency	3	524288	PROP_P1.HD2.FROMPEC.FLT1027	PORT1_HD2	1	2
68	23/09/2010 02:25:25	262144	C motor limitation by voltage	5	262144	PROP_P1.HD2.FROMPEC.FLT1028	PORT1_HD2	1	2
69	23/09/2010 02:25:25	524288	C switchboard supply loss	3	524288	PROP_P1.HD2.FROMPEC.FLT1043	PORT1_HD2	1	2
70	23/09/2010 02:25:25	524288	M POD monitoring system FT	3	524288	PROP_P1.HD2.SL.STERN_PP1.FAULT	PORT1_HD2	1	2
124	23/09/2010 02:25:25	Etat à 0	Motor fan 1 ON		64	PROP_P1.HD2.MOTOR.FAN 1.ON	PORT1_HD2		2
76	23/09/2010 02:25:25	262144	C motor limitation by frequency	5	262144	PROP_P3.HD2.FROMPEC.FLT1027	PORT3_HD2	1	2
77	23/09/2010 02:25:25	262144	C motor limitation by voltage	5	262144	PROP_P3.HD2.FROMPEC.FLT1028	PORT3_HD2	1	2
78	23/09/2010 02:25:25	524288	C switchboard supply loss	3	524288	PROP_P3.HD2.FROMPEC.FLT1043	PORT3_HD2	1	2
140	23/09/2010 02:25:25	Etat à 0	Motor fan 1 ON		64	PROP_P3.HD2.MOTOR.FAN 1.ON	PORT3_HD2		2
154	23/09/2010 02:25:25	Etat à 0	A.Pilot2 azimuth ctrl		64	PROP_P3.HD1.A_PILOT2.S_CTRL.ON	PORT3_HD1		2
85	23/09/2010 02:25:25	262144	C motor limitation by frequency	5	262144	PROP_P3.HD1.FROMPEC.FLT1027	PORT3_HD1	1	2

86	23/09/2010 02:25:25	262144	C motor limitation by voltage	5	262144	PROP_P3.HD1.FROMPEC.FLT1028	PORT3_HD1	1	2
156	23/09/2010 02:25:25	Etat à 1	Converter pump 1 ON	1	512	PROP_P3.HD1.CONV_NB.DEION_PP1.ON	PORT3_HD1		2
153	23/09/2010 02:25:25	Etat à 1	Helm free azimuth ctrl	1	512	PROP_P3.HD1.HELM_F.S_CTRL.ON	PORT3_HD1		2
158	23/09/2010 02:25:25	Etat à 1	Lub DE pump 1 ON	1	512	PROP_P3.HD1.MOTOR.DE_PP1.ON	PORT3_HD1		2
159	23/09/2010 02:25:25	Etat à 1	Lub NDE pump 1 ON	1	512	PROP_P3.HD1.MOTOR.NDE_PP1.ON	PORT3_HD1		2
157	23/09/2010 02:25:25	Etat à 0	Motor fan 1 ON		64	PROP_P3.HD1.MOTOR.FAN 1.ON	PORT3_HD1		2
155	23/09/2010 02:25:25	Etat à 1	Transfo auxil 1 ON	1	512	PROP_P3.HD1.TRANSF1.AUX1.ON	PORT3_HD1		2
170	23/09/2010 02:25:26	Etat à 0	A.Pilot2 azimuth ctrl		64	PROP_S4.HD1.A_PILOT2.S_CTRL.ON	STBD4_HD1		2
87	23/09/2010 02:25:26	262144	C motor limitation by frequency	5	262144	PROP_S4.HD1.FROMPEC.FLT1027	STBD4_HD1	1	2
88	23/09/2010 02:25:26	262144	C motor limitation by voltage	5	262144	PROP_S4.HD1.FROMPEC.FLT1028	STBD4_HD1	1	2
172	23/09/2010 02:25:26	Etat à 1	Converter pump 1 ON	1	512	PROP_S4.HD1.CONV_NB.DEION_PP1.ON	STBD4_HD1		2
169	23/09/2010 02:25:26	Etat à 1	Helm free azimuth ctrl	1	512	PROP_S4.HD1.HELM_F.S_CTRL.ON	STBD4_HD1		2
174	23/09/2010 02:25:26	Etat à 1	Lub DE pump 1 ON	1	512	PROP_S4.HD1.MOTOR.DE_PP1.ON	STBD4_HD1		2
175	23/09/2010 02:25:26	Etat à 1	Lub NDE pump 1 ON	1	512	PROP_S4.HD1.MOTOR.NDE_PP1.ON	STBD4_HD1		2
173	23/09/2010 02:25:26	Etat à 0	Motor fan 1 ON		64	PROP_S4.HD1.MOTOR.FAN 1.ON	STBD4_HD1		2
171	23/09/2010 02:25:26	Etat à 1	Transfo auxil 1 ON	1	512	PROP_S4.HD1.TRANSF1.AUX1.ON	STBD4_HD1		2
180	23/09/2010 02:25:26	Etat à 0	A.Pilot2 azimuth ctrl		64	PROP_S4.HD2.A_PILOT2.S_CTRL.ON	STBD4_HD2		2
89	23/09/2010 02:25:26	262144	C motor limitation by frequency	5	262144	PROP_S4.HD2.FROMPEC.FLT1027	STBD4_HD2	1	2
90	23/09/2010 02:25:26	262144	C motor limitation by voltage	5	262144	PROP_S4.HD2.FROMPEC.FLT1028	STBD4_HD2	1	2
98	23/09/2010 02:25:26	Etat à 1	Converter pump 1 ON	1	512	PROP_S4.HD2.CONV_NB.DEION_PP1.ON	STBD4_HD2		2
179	23/09/2010 02:25:26	Etat à 1	Helm free azimuth ctrl	1	512	PROP_S4.HD2.HELM_F.S_CTRL.ON	STBD4_HD2		2
99	23/09/2010 02:25:26	Etat à 1	Lub DE pump 1 ON	1	512	PROP_S4.HD2.MOTOR.DE_PP1.ON	STBD4_HD2		2
100	23/09/2010 02:25:26	Etat à 1	Lub NDE pump 1 ON	1	512	PROP_S4.HD2.MOTOR.NDE_PP1.ON	STBD4_HD2		2
181	23/09/2010 02:25:26	Etat à 0	Motor fan 1 ON		64	PROP_S4.HD2.MOTOR.FAN 1.ON	STBD4_HD2		2
97	23/09/2010 02:25:26	Etat à 1	Transfo auxil 1 ON	1	512	PROP_S4.HD2.TRANSF1.AUX1.ON	STBD4_HD2		2
91	23/09/2010 02:25:26	262144	C motor limitation by frequency	5	262144	PROP_S2.HD2.FROMPEC.FLT1027	STBD2_HD2	1	2
92	23/09/2010 02:25:26	262144	C motor limitation by voltage	5	262144	PROP_S2.HD2.FROMPEC.FLT1028	STBD2_HD2	1	2
107	23/09/2010 02:25:26	Etat à 1	Converter pump 1 ON	1	512	PROP_S2.HD2.CONV_NB.DEION_PP1.ON	STBD2_HD2		2
111	23/09/2010 02:25:26	Etat à 0	Lub DE heater ON		64	PROP_S2.HD2.MOTOR.DE_HEAT.ON	STBD2_HD2		2
109	23/09/2010 02:25:26	Etat à 0	Lub DE pump 2 ON		64	PROP_S2.HD2.MOTOR.DE_PP2.ON	STBD2_HD2		2
112	23/09/2010 02:25:26	Etat à 0	Lub NDE heater ON		64	PROP_S2.HD2.MOTOR.NDE_HEAT.ON	STBD2_HD2		2
110	23/09/2010 02:25:26	Etat à 0	Lub NDE pump 2 ON		64	PROP_S2.HD2.MOTOR.NDE_PP2.ON	STBD2_HD2		2
106	23/09/2010 02:25:26	Etat à 1	Transfo auxil 1 ON	1	512	PROP_S2.HD2.TRANSF1.AUX1.ON	STBD2_HD2		2
93	23/09/2010 02:25:26	262144	C motor limitation by frequency	5	262144	PROP_P1.HD1.FROMPEC.FLT1027	PORT1_HD1	1	2
94	23/09/2010 02:25:26	262144	C motor limitation by voltage	5	262144	PROP_P1.HD1.FROMPEC.FLT1028	PORT1_HD1	1	2
121	23/09/2010 02:25:26	Etat à 0	Lub DE heater ON		64	PROP_P1.HD1.MOTOR.DE_HEAT.ON	PORT1_HD1		2
122	23/09/2010 02:25:26	Etat à 0	Lub NDE heater ON		64	PROP_P1.HD1.MOTOR.NDE_HEAT.ON	PORT1_HD1		2
120	23/09/2010 02:25:26	Etat à 0	Lub NDE pump 2 ON		64	PROP_P1.HD1.MOTOR.NDE_PP2.ON	PORT1_HD1		2
102	23/09/2010 02:25:26	262144	C motor limitation by frequency	5	262144	PROP_S2.HD1.FROMPEC.FLT1027	STBD2_HD1	1	2
103	23/09/2010 02:25:26	262144	C motor limitation by frequency	5	262144	PROP_P1.HD2.FROMPEC.FLT1027	PORT1_HD2	1	2
183	23/09/2010 02:25:26	Etat à 0	A.Pilot2 azimuth ctrl		64	PROP_P3.HD2.A_PILOT2.S_CTRL.ON	PORT3_HD2		2
182	23/09/2010 02:25:26	Etat à 1	Helm free azimuth ctrl	1	512	PROP_P3.HD2.HELM_F.S_CTRL.ON	PORT3_HD2		2
114	23/09/2010 02:25:27	524288	C alarm by POD steering	3	524288	PROP_S4.HD1.FROMPEC.FLT1040	STBD4_HD1	1	2
115	23/09/2010 02:25:27	524288	CLS system warning	3	524288	PROP_S4.HD1.FROMPEC_S.SFT0096	STBD4_HD1	1	2
116	23/09/2010 02:25:27	524288	C alarm by POD steering	3	524288	PROP_S4.HD2.FROMPEC.FLT1040	STBD4_HD2	1	2
117	23/09/2010 02:25:27	524288	CLS system warning	3	524288	PROP_S4.HD2.FROMPEC_S.SFT0096	STBD4_HD2	1	2
205	23/09/2010 02:25:27	Etat à 0	Steering line 1 ON		64	PROP_P3.HD2.STEER.LINE1.ON	PORT3_HD2		2
206	23/09/2010 02:25:27	Etat à 0	Steering line 2 ON		64	PROP_P3.HD2.STEER.LINE2.ON	PORT3_HD2		2
207	23/09/2010 02:25:27	Etat à 0	Steering line 3 ON		64	PROP_P3.HD2.STEER.LINE3.ON	PORT3_HD2		2
208	23/09/2010 02:25:27	Etat à 0	Steering line 4 ON		64	PROP_P3.HD2.STEER.LINE4.ON	PORT3_HD2		2
129	23/09/2010 02:25:27	524288	M POD fan 1 ctrl not healthy	3	524288	PROP_P3.HD1.FROMPEC.FLT1221	PORT3_HD1	1	2

128	23/09/2010 02:25:27	524288	MB underflux	3	524288	PROP_P3.HD1.FROMPEC.FLT0324	PORT3_HD1	1	2
209	23/09/2010 02:25:27	Etat à 0	Steering line 1 ON		64	PROP_P3.HD1.STEER.LINE1.ON	PORT3_HD1		2
210	23/09/2010 02:25:27	Etat à 0	Steering line 2 ON		64	PROP_P3.HD1.STEER.LINE2.ON	PORT3_HD1		2
211	23/09/2010 02:25:27	Etat à 0	Steering line 3 ON		64	PROP_P3.HD1.STEER.LINE3.ON	PORT3_HD1		2
212	23/09/2010 02:25:27	Etat à 0	Steering line 4 ON		64	PROP_P3.HD1.STEER.LINE4.ON	PORT3_HD1		2
126	23/09/2010 02:25:28	524288	M POD fan 1 ctrl not healthy	3	524288	PROP_S4.HD1.FROMPEC.FLT1221	STBD4_HD1	1	2
125	23/09/2010 02:25:28	524288	MB underflux	3	524288	PROP_S4.HD1.FROMPEC.FLT0324	STBD4_HD1	1	2
127	23/09/2010 02:25:28	524288	MB underflux	3	524288	PROP_S4.HD2.FROMPEC.FLT0324	STBD4_HD2	1	2
131	23/09/2010 02:25:28	524288	C HPC-DP link FT	3	524288	PROP_S2.HD2.FROMPEC.FLT0853	STBD2_HD2	1	2
132	23/09/2010 02:25:28	262144	C switchboard supply loss	5	262144	PROP_S2.HD2.FROMPEC.FLT1043	STBD2_HD2	1	2
133	23/09/2010 02:25:28	524288	M POD fan 1 ctrl not healthy	3	524288	PROP_S2.HD2.FROMPEC.FLT1221	STBD2_HD2	1	2
130	23/09/2010 02:25:28	524288	MB underflux	3	524288	PROP_S2.HD2.FROMPEC.FLT0324	STBD2_HD2	1	2
137	23/09/2010 02:25:28	524288	C HPC-DP link FT	3	524288	PROP_P1.HD1.FROMPEC.FLT0853	PORT1_HD1	1	2
138	23/09/2010 02:25:28	262144	C switchboard supply loss	5	262144	PROP_P1.HD1.FROMPEC.FLT1043	PORT1_HD1	1	2
139	23/09/2010 02:25:28	524288	M POD fan 1 ctrl not healthy	3	524288	PROP_P1.HD1.FROMPEC.FLT1221	PORT1_HD1	1	2
136	23/09/2010 02:25:28	524288	MB underflux	3	524288	PROP_P1.HD1.FROMPEC.FLT0324	PORT1_HD1	1	2
142	23/09/2010 02:25:28	524288	C HPC-DP link FT	3	524288	PROP_S2.HD1.FROMPEC.FLT0853	STBD2_HD1	1	2
143	23/09/2010 02:25:28	262144	C switchboard supply loss	5	262144	PROP_S2.HD1.FROMPEC.FLT1043	STBD2_HD1	1	2
144	23/09/2010 02:25:28	524288	M POD fan 1 ctrl not healthy	3	524288	PROP_S2.HD1.FROMPEC.FLT1221	STBD2_HD1	1	2
141	23/09/2010 02:25:28	524288	MB underflux	3	524288	PROP_S2.HD1.FROMPEC.FLT0324	STBD2_HD1	1	2
146	23/09/2010 02:25:28	524288	C HPC-DP link FT	3	524288	PROP_P1.HD2.FROMPEC.FLT0853	PORT1_HD2	1	2
147	23/09/2010 02:25:28	262144	C switchboard supply loss	5	262144	PROP_P1.HD2.FROMPEC.FLT1043	PORT1_HD2	1	2
148	23/09/2010 02:25:28	524288	M POD fan 1 ctrl not healthy	3	524288	PROP_P1.HD2.FROMPEC.FLT1221	PORT1_HD2	1	2
145	23/09/2010 02:25:28	524288	MB underflux	3	524288	PROP_P1.HD2.FROMPEC.FLT0324	PORT1_HD2	1	2
150	23/09/2010 02:25:28	524288	C HPC-DP link FT	3	524288	PROP_P3.HD2.FROMPEC.FLT0853	PORT3_HD2	1	2
151	23/09/2010 02:25:28	262144	C switchboard supply loss	5	262144	PROP_P3.HD2.FROMPEC.FLT1043	PORT3_HD2	1	2
152	23/09/2010 02:25:28	524288	M POD fan 1 ctrl not healthy	3	524288	PROP_P3.HD2.FROMPEC.FLT1221	PORT3_HD2	1	2
149	23/09/2010 02:25:28	524288	MB underflux	3	524288	PROP_P3.HD2.FROMPEC.FLT0324	PORT3_HD2	1	2
165	23/09/2010 02:25:28	524288	C HPC-DP link FT	3	524288	PROP_P3.HD1.FROMPEC.FLT0853	PORT3_HD1	1	2
166	23/09/2010 02:25:28	262144	C switchboard supply loss	5	262144	PROP_P3.HD1.FROMPEC.FLT1043	PORT3_HD1	1	2
160	23/09/2010 02:25:29	524288	C HPC-DP link FT	3	524288	PROP_S4.HD1.FROMPEC.FLT0853	STBD4_HD1	1	2
161	23/09/2010 02:25:29	262144	C switchboard supply loss	5	262144	PROP_S4.HD1.FROMPEC.FLT1043	STBD4_HD1	1	2
220	23/09/2010 02:25:29	Etat à 1	Steering line 1 brake ON	1	512	PROP_S4.HD1.STEER.LINE1.BRAKE.ON	STBD4_HD1		2
216	23/09/2010 02:25:29	Etat à 0	Steering line 1 ON		64	PROP_S4.HD1.STEER.LINE1.ON	STBD4_HD1		2
221	23/09/2010 02:25:29	Etat à 1	Steering line 2 brake ON	1	512	PROP_S4.HD1.STEER.LINE2.BRAKE.ON	STBD4_HD1		2
217	23/09/2010 02:25:29	Etat à 0	Steering line 2 ON		64	PROP_S4.HD1.STEER.LINE2.ON	STBD4_HD1		2
222	23/09/2010 02:25:29	Etat à 1	Steering line 3 brake ON	1	512	PROP_S4.HD1.STEER.LINE3.BRAKE.ON	STBD4_HD1		2
218	23/09/2010 02:25:29	Etat à 0	Steering line 3 ON		64	PROP_S4.HD1.STEER.LINE3.ON	STBD4_HD1		2
223	23/09/2010 02:25:29	Etat à 1	Steering line 4 brake ON	1	512	PROP_S4.HD1.STEER.LINE4.BRAKE.ON	STBD4_HD1		2
219	23/09/2010 02:25:29	Etat à 0	Steering line 4 ON		64	PROP_S4.HD1.STEER.LINE4.ON	STBD4_HD1		2
162	23/09/2010 02:25:29	524288	C HPC-DP link FT	3	524288	PROP_S4.HD2.FROMPEC.FLT0853	STBD4_HD2	1	2
163	23/09/2010 02:25:29	262144	C switchboard supply loss	5	262144	PROP_S4.HD2.FROMPEC.FLT1043	STBD4_HD2	1	2
164	23/09/2010 02:25:29	524288	M POD fan 1 ctrl not healthy	3	524288	PROP_S4.HD2.FROMPEC.FLT1221	STBD4_HD2	1	2
224	23/09/2010 02:25:29	Etat à 1	Motor fan 2 ON	1	512	PROP_S4.HD2.MOTOR.FAN 2.ON	STBD4_HD2		2
229	23/09/2010 02:25:29	Etat à 1	Steering line 1 brake ON	1	512	PROP_S4.HD2.STEER.LINE1.BRAKE.ON	STBD4_HD2		2
225	23/09/2010 02:25:29	Etat à 0	Steering line 1 ON		64	PROP_S4.HD2.STEER.LINE1.ON	STBD4_HD2		2
230	23/09/2010 02:25:29	Etat à 1	Steering line 2 brake ON	1	512	PROP_S4.HD2.STEER.LINE2.BRAKE.ON	STBD4_HD2		2
226	23/09/2010 02:25:29	Etat à 0	Steering line 2 ON		64	PROP_S4.HD2.STEER.LINE2.ON	STBD4_HD2		2
231	23/09/2010 02:25:29	Etat à 1	Steering line 3 brake ON	1	512	PROP_S4.HD2.STEER.LINE3.BRAKE.ON	STBD4_HD2		2
227	23/09/2010 02:25:29	Etat à 0	Steering line 3 ON		64	PROP_S4.HD2.STEER.LINE3.ON	STBD4_HD2		2
232	23/09/2010 02:25:29	Etat à 1	Steering line 4 brake ON	1	512	PROP_S4.HD2.STEER.LINE4.BRAKE.ON	STBD4_HD2		2

228	23/09/2010 02:25:29	Etat à 0	Steering line 4 ON		64	PROP_S4.HD2.STEER.LINE4.ON	STBD4_HD2		2
168	23/09/2010 02:25:29	262144	MB underflux	5	262144	PROP_S2.HD2.FROMPEC.FLT0324	STBD2_HD2	1	2
234	23/09/2010 02:25:29	Etat à 1	Motor fan 2 ON	1	512	PROP_S2.HD2.MOTOR.FAN 2.ON	STBD2_HD2		2
167	23/09/2010 02:25:29	262144	NB undervoltage	5	262144	PROP_S2.HD2.FROMPEC.FLT0212	STBD2_HD2	1	2
178	23/09/2010 02:25:29	262144	E undervoltage	5	262144	PROP_P1.HD1.FROMPEC.FLT0354	PORT1_HD1	1	2
177	23/09/2010 02:25:29	262144	MB underflux	5	262144	PROP_P1.HD1.FROMPEC.FLT0324	PORT1_HD1	1	2
235	23/09/2010 02:25:29	Etat à 1	Motor fan 2 ON	1	512	PROP_P1.HD1.MOTOR.FAN 2.ON	PORT1_HD1		2
176	23/09/2010 02:25:29	262144	NB undervoltage	5	262144	PROP_P1.HD1.FROMPEC.FLT0212	PORT1_HD1	1	2
188	23/09/2010 02:25:29	262144	E undervoltage	5	262144	PROP_S2.HD1.FROMPEC.FLT0354	STBD2_HD1	1	2
187	23/09/2010 02:25:29	262144	MB underflux	5	262144	PROP_S2.HD1.FROMPEC.FLT0324	STBD2_HD1	1	2
237	23/09/2010 02:25:29	Etat à 1	Motor fan 2 ON	1	512	PROP_S2.HD1.MOTOR.FAN 2.ON	STBD2_HD1		2
186	23/09/2010 02:25:29	262144	NB undervoltage	5	262144	PROP_S2.HD1.FROMPEC.FLT0212	STBD2_HD1	1	2
185	23/09/2010 02:25:29	262144	MB underflux	5	262144	PROP_P1.HD2.FROMPEC.FLT0324	PORT1_HD2	1	2
236	23/09/2010 02:25:29	Etat à 1	Motor fan 2 ON	1	512	PROP_P1.HD2.MOTOR.FAN 2.ON	PORT1_HD2		2
184	23/09/2010 02:25:29	262144	NB undervoltage	5	262144	PROP_P1.HD2.FROMPEC.FLT0212	PORT1_HD2	1	2
190	23/09/2010 02:25:29	262144	MB underflux	5	262144	PROP_P3.HD2.FROMPEC.FLT0324	PORT3_HD2	1	2
238	23/09/2010 02:25:29	Etat à 1	Motor fan 2 ON	1	512	PROP_P3.HD2.MOTOR.FAN 2.ON	PORT3_HD2		2
189	23/09/2010 02:25:29	262144	NB undervoltage	5	262144	PROP_P3.HD2.FROMPEC.FLT0212	PORT3_HD2	1	2
239	23/09/2010 02:25:29	Etat à 1	Steering line 1 brake ON	1	512	PROP_P3.HD2.STEER.LINE1.BRAKE.ON	PORT3_HD2		2
240	23/09/2010 02:25:29	Etat à 1	Steering line 2 brake ON	1	512	PROP_P3.HD2.STEER.LINE2.BRAKE.ON	PORT3_HD2		2
241	23/09/2010 02:25:29	Etat à 1	Steering line 3 brake ON	1	512	PROP_P3.HD2.STEER.LINE3.BRAKE.ON	PORT3_HD2		2
242	23/09/2010 02:25:29	Etat à 1	Steering line 4 brake ON	1	512	PROP_P3.HD2.STEER.LINE4.BRAKE.ON	PORT3_HD2		2
193	23/09/2010 02:25:29	262144	E undervoltage	5	262144	PROP_P3.HD1.FROMPEC.FLT0354	PORT3_HD1	1	2
194	23/09/2010 02:25:29	262144	M POD fan 1 ctrl not healthy	5	262144	PROP_P3.HD1.FROMPEC.FLT1221	PORT3_HD1	1	2
192	23/09/2010 02:25:29	262144	MB underflux	5	262144	PROP_P3.HD1.FROMPEC.FLT0324	PORT3_HD1	1	2
243	23/09/2010 02:25:29	Etat à 1	Motor fan 2 ON	1	512	PROP_P3.HD1.MOTOR.FAN 2.ON	PORT3_HD1		2
191	23/09/2010 02:25:29	262144	NB undervoltage	5	262144	PROP_P3.HD1.FROMPEC.FLT0212	PORT3_HD1	1	2
244	23/09/2010 02:25:29	Etat à 1	Steering line 1 brake ON	1	512	PROP_P3.HD1.STEER.LINE1.BRAKE.ON	PORT3_HD1		2
245	23/09/2010 02:25:29	Etat à 1	Steering line 2 brake ON	1	512	PROP_P3.HD1.STEER.LINE2.BRAKE.ON	PORT3_HD1		2
246	23/09/2010 02:25:29	Etat à 1	Steering line 3 brake ON	1	512	PROP_P3.HD1.STEER.LINE3.BRAKE.ON	PORT3_HD1		2
247	23/09/2010 02:25:29	Etat à 1	Steering line 4 brake ON	1	512	PROP_P3.HD1.STEER.LINE4.BRAKE.ON	PORT3_HD1		2
198	23/09/2010 02:25:30	262144	C alarm by POD steering	5	262144	PROP_S4.HD1.FROMPEC.FLT1040	STBD4_HD1	1	2
200	23/09/2010 02:25:30	262144	CLS system warning	5	262144	PROP_S4.HD1.FROMPEC_S.SFT0096	STBD4_HD1	1	2
197	23/09/2010 02:25:30	262144	E undervoltage	5	262144	PROP_S4.HD1.FROMPEC.FLT0354	STBD4_HD1	1	2
199	23/09/2010 02:25:30	262144	M POD fan 1 ctrl not healthy	5	262144	PROP_S4.HD1.FROMPEC.FLT1221	STBD4_HD1	1	2
196	23/09/2010 02:25:30	262144	MB underflux	5	262144	PROP_S4.HD1.FROMPEC.FLT0324	STBD4_HD1	1	2
248	23/09/2010 02:25:30	Etat à 1	Motor fan 2 ON	1	512	PROP_S4.HD1.MOTOR.FAN 2.ON	STBD4_HD1		2
195	23/09/2010 02:25:30	262144	NB undervoltage	5	262144	PROP_S4.HD1.FROMPEC.FLT0212	STBD4_HD1	1	2
203	23/09/2010 02:25:30	262144	C alarm by POD steering	5	262144	PROP_S4.HD2.FROMPEC.FLT1040	STBD4_HD2	1	2
204	23/09/2010 02:25:30	262144	CLS system warning	5	262144	PROP_S4.HD2.FROMPEC_S.SFT0096	STBD4_HD2	1	2
202	23/09/2010 02:25:30	262144	MB underflux	5	262144	PROP_S4.HD2.FROMPEC.FLT0324	STBD4_HD2	1	2
201	23/09/2010 02:25:30	262144	NB undervoltage	5	262144	PROP_S4.HD2.FROMPEC.FLT0212	STBD4_HD2	1	2
213	23/09/2010 02:25:30	262144	M POD fan 1 ctrl not healthy	5	262144	PROP_S2.HD1.FROMPEC.FLT1221	STBD2_HD1	1	2
214	23/09/2010 02:25:30	262144	M POD fan 1 ctrl not healthy	5	262144	PROP_P3.HD2.FROMPEC.FLT1221	PORT3_HD2	1	2
215	23/09/2010 02:25:31	262144	M POD fan 1 ctrl not healthy	5	262144	PROP_S4.HD2.FROMPEC.FLT1221	STBD4_HD2	1	2
233	23/09/2010 02:25:31	262144	M POD fan 1 ctrl not healthy	5	262144	PROP_P1.HD2.FROMPEC.FLT1221	PORT1_HD2	1	2
249	23/09/2010 02:25:32	Etat à 1	Steering line 1 ON	1	512	PROP_S4.HD1.STEER.LINE1.ON	STBD4_HD1		2
250	23/09/2010 02:25:32	Etat à 1	Steering line 2 ON	1	512	PROP_S4.HD1.STEER.LINE2.ON	STBD4_HD1		2
251	23/09/2010 02:25:32	Etat à 1	Steering line 3 ON	1	512	PROP_S4.HD1.STEER.LINE3.ON	STBD4_HD1		2
252	23/09/2010 02:25:32	Etat à 1	Steering line 4 ON	1	512	PROP_S4.HD1.STEER.LINE4.ON	STBD4_HD1		2
253	23/09/2010 02:25:32	Etat à 1	Steering line 1 ON	1	512	PROP_S4.HD2.STEER.LINE1.ON	STBD4_HD2		2

254	23/09/2010 02:25:32	Etat à 1	Steering line 2 ON	1	512	PROP_S4.HD2.STEER.LINE2.ON	STBD4_HD2		2
255	23/09/2010 02:25:32	Etat à 1	Steering line 3 ON	1	512	PROP_S4.HD2.STEER.LINE3.ON	STBD4_HD2		2
256	23/09/2010 02:25:32	Etat à 1	Steering line 4 ON	1	512	PROP_S4.HD2.STEER.LINE4.ON	STBD4_HD2		2
261	23/09/2010 02:25:32	Etat à 0	Steering line 1 brake ON		64	PROP_P3.HD2.STEER.LINE1.BRAKE.ON	PORT3_HD2		2
257	23/09/2010 02:25:32	Etat à 1	Steering line 1 ON	1	512	PROP_P3.HD2.STEER.LINE1.ON	PORT3_HD2		2
262	23/09/2010 02:25:32	Etat à 0	Steering line 2 brake ON		64	PROP_P3.HD2.STEER.LINE2.BRAKE.ON	PORT3_HD2		2
258	23/09/2010 02:25:32	Etat à 1	Steering line 2 ON	1	512	PROP_P3.HD2.STEER.LINE2.ON	PORT3_HD2		2
263	23/09/2010 02:25:32	Etat à 0	Steering line 3 brake ON		64	PROP_P3.HD2.STEER.LINE3.BRAKE.ON	PORT3_HD2		2
259	23/09/2010 02:25:32	Etat à 1	Steering line 3 ON	1	512	PROP_P3.HD2.STEER.LINE3.ON	PORT3_HD2		2
264	23/09/2010 02:25:32	Etat à 0	Steering line 4 brake ON		64	PROP_P3.HD2.STEER.LINE4.BRAKE.ON	PORT3_HD2		2
260	23/09/2010 02:25:32	Etat à 1	Steering line 4 ON	1	512	PROP_P3.HD2.STEER.LINE4.ON	PORT3_HD2		2
277	23/09/2010 02:25:32	Etat à 0	Steering line 1 brake ON		64	PROP_P3.HD1.STEER.LINE1.BRAKE.ON	PORT3_HD1		2
273	23/09/2010 02:25:32	Etat à 1	Steering line 1 ON	1	512	PROP_P3.HD1.STEER.LINE1.ON	PORT3_HD1		2
278	23/09/2010 02:25:32	Etat à 0	Steering line 2 brake ON		64	PROP_P3.HD1.STEER.LINE2.BRAKE.ON	PORT3_HD1		2
274	23/09/2010 02:25:32	Etat à 1	Steering line 2 ON	1	512	PROP_P3.HD1.STEER.LINE2.ON	PORT3_HD1		2
279	23/09/2010 02:25:32	Etat à 0	Steering line 3 brake ON		64	PROP_P3.HD1.STEER.LINE3.BRAKE.ON	PORT3_HD1		2
275	23/09/2010 02:25:32	Etat à 1	Steering line 3 ON	1	512	PROP_P3.HD1.STEER.LINE3.ON	PORT3_HD1		2
280	23/09/2010 02:25:32	Etat à 0	Steering line 4 brake ON		64	PROP_P3.HD1.STEER.LINE4.BRAKE.ON	PORT3_HD1		2
276	23/09/2010 02:25:32	Etat à 1	Steering line 4 ON	1	512	PROP_P3.HD1.STEER.LINE4.ON	PORT3_HD1		2
265	23/09/2010 02:25:33	Etat à 0	Steering line 1 brake ON		64	PROP_S4.HD1.STEER.LINE1.BRAKE.ON	STBD4_HD1		2
266	23/09/2010 02:25:33	Etat à 0	Steering line 2 brake ON		64	PROP_S4.HD1.STEER.LINE2.BRAKE.ON	STBD4_HD1		2
267	23/09/2010 02:25:33	Etat à 0	Steering line 3 brake ON		64	PROP_S4.HD1.STEER.LINE3.BRAKE.ON	STBD4_HD1		2
268	23/09/2010 02:25:33	Etat à 0	Steering line 4 brake ON		64	PROP_S4.HD1.STEER.LINE4.BRAKE.ON	STBD4_HD1		2
269	23/09/2010 02:25:33	Etat à 0	Steering line 1 brake ON		64	PROP_S4.HD2.STEER.LINE1.BRAKE.ON	STBD4_HD2		2
270	23/09/2010 02:25:33	Etat à 0	Steering line 2 brake ON		64	PROP_S4.HD2.STEER.LINE2.BRAKE.ON	STBD4_HD2		2
271	23/09/2010 02:25:33	Etat à 0	Steering line 3 brake ON		64	PROP_S4.HD2.STEER.LINE3.BRAKE.ON	STBD4_HD2		2
272	23/09/2010 02:25:33	Etat à 0	Steering line 4 brake ON		64	PROP_S4.HD2.STEER.LINE4.BRAKE.ON	STBD4_HD2		2
284	23/09/2010 02:25:38	Etat à 1	Motor fan 1 ON	1	512	PROP_S2.HD1.MOTOR.FAN 1.ON	STBD2_HD1		2
287	23/09/2010 02:25:38	Etat à 1	Motor fan 1 ON	1	512	PROP_P3.HD2.MOTOR.FAN 1.ON	PORT3_HD2		2
288	23/09/2010 02:25:38	Etat à 0	Motor fan 2 ON		64	PROP_P3.HD2.MOTOR.FAN 2.ON	PORT3_HD2		2
297	23/09/2010 02:25:38	Etat à 1	Motor fan 1 ON	1	512	PROP_P3.HD1.MOTOR.FAN 1.ON	PORT3_HD1		2
298	23/09/2010 02:25:38	Etat à 0	Motor fan 2 ON		64	PROP_P3.HD1.MOTOR.FAN 2.ON	PORT3_HD1		2
291	23/09/2010 02:25:39	Etat à 1	Motor fan 1 ON	1	512	PROP_S4.HD1.MOTOR.FAN 1.ON	STBD4_HD1		2
292	23/09/2010 02:25:39	Etat à 0	Motor fan 2 ON		64	PROP_S4.HD1.MOTOR.FAN 2.ON	STBD4_HD1		2
293	23/09/2010 02:25:39	Etat à 1	Motor fan 1 ON	1	512	PROP_S4.HD2.MOTOR.FAN 1.ON	STBD4_HD2		2
294	23/09/2010 02:25:39	Etat à 0	Motor fan 2 ON		64	PROP_S4.HD2.MOTOR.FAN 2.ON	STBD4_HD2		2
300	23/09/2010 02:25:39	Etat à 1	Motor fan 1 ON	1	512	PROP_S2.HD2.MOTOR.FAN 1.ON	STBD2_HD2		2
301	23/09/2010 02:25:39	Etat à 1	Motor fan 1 ON	1	512	PROP_P1.HD1.MOTOR.FAN 1.ON	PORT1_HD1		2
302	23/09/2010 02:25:39	Etat à 0	Motor fan 2 ON		64	PROP_P1.HD1.MOTOR.FAN 2.ON	PORT1_HD1		2
312	23/09/2010 02:25:39	Etat à 1	Auxiliaires seq.ON	1	512	PROP_S2.HD1.RBANNER.AUX.ON	STBD2_HD1		2
306	23/09/2010 02:25:39	Etat à 1	Auxiliaires seq.ON	1	512	PROP_P1.HD2.RBANNER.AUX.ON	PORT1_HD2		2
307	23/09/2010 02:25:39	Etat à 1	Motor fan 1 ON	1	512	PROP_P1.HD2.MOTOR.FAN 1.ON	PORT1_HD2		2
308	23/09/2010 02:25:39	Etat à 0	Motor fan 2 ON		64	PROP_P1.HD2.MOTOR.FAN 2.ON	PORT1_HD2		2
313	23/09/2010 02:25:39	Etat à 1	Auxiliaires seq.ON	1	512	PROP_P3.HD2.RBANNER.AUX.ON	PORT3_HD2		2
317	23/09/2010 02:25:39	Etat à 1	Auxiliaires seq.ON	1	512	PROP_P3.HD1.RBANNER.AUX.ON	PORT3_HD1		2
315	23/09/2010 02:25:40	Etat à 1	Auxiliaires seq.ON	1	512	PROP_S4.HD1.RBANNER.AUX.ON	STBD4_HD1		2
316	23/09/2010 02:25:40	Etat à 1	Auxiliaires seq.ON	1	512	PROP_S4.HD2.RBANNER.AUX.ON	STBD4_HD2		2
318	23/09/2010 02:25:40	Etat à 1	Auxiliaires seq.ON	1	512	PROP_S2.HD2.RBANNER.AUX.ON	STBD2_HD2		2
281	23/09/2010 02:25:40	524288	C motor limitation by frequency	3	524288	PROP_S2.HD2.FROMPEC.FLT1027	STBD2_HD2	1	2
282	23/09/2010 02:25:40	524288	C motor limitation by frequency	3	524288	PROP_P1.HD1.FROMPEC.FLT1027	PORT1_HD1	1	2
319	23/09/2010 02:25:40	Etat à 1	Auxiliaires seq.ON	1	512	PROP_P1.HD1.RBANNER.AUX.ON	PORT1_HD1		2

283	23/09/2010 02:25:40	524288	C motor limitation by frequency	3	524288	PROP_S2.HD1.FROMPEC.FLT1027	STBD2_HD1	1	2
322	23/09/2010 02:25:40	Etat à 0	Generator 2 CB closed		64	PROP_S2.HD1.GENE2.CB.CLOSED	STBD2_HD1		2
323	23/09/2010 02:25:40	Etat à 0	Generator 3 CB closed		64	PROP_S2.HD1.GENE3.CB.CLOSED	STBD2_HD1		2
285	23/09/2010 02:25:40	524288	C motor limitation by frequency	3	524288	PROP_P1.HD2.FROMPEC.FLT1027	PORT1_HD2	1	2
324	23/09/2010 02:25:40	Etat à 0	Generator 2 CB closed		64	PROP_P1.HD2.GENE2.CB.CLOSED	PORT1_HD2		2
325	23/09/2010 02:25:40	Etat à 0	Generator 3 CB closed		64	PROP_P1.HD2.GENE3.CB.CLOSED	PORT1_HD2		2
286	23/09/2010 02:25:40	524288	C motor limitation by frequency	3	524288	PROP_P3.HD2.FROMPEC.FLT1027	PORT3_HD2	1	2
327	23/09/2010 02:25:40	Etat à 0	Generator 2 CB closed		64	PROP_P3.HD2.GENE2.CB.CLOSED	PORT3_HD2		2
328	23/09/2010 02:25:40	Etat à 0	Generator 3 CB closed		64	PROP_P3.HD2.GENE3.CB.CLOSED	PORT3_HD2		2
295	23/09/2010 02:25:40	524288	C motor limitation by frequency	3	524288	PROP_P3.HD1.FROMPEC.FLT1027	PORT3_HD1	1	2
334	23/09/2010 02:25:40	Etat à 0	Generator 2 CB closed		64	PROP_P3.HD1.GENE2.CB.CLOSED	PORT3_HD1		2
335	23/09/2010 02:25:40	Etat à 0	Generator 3 CB closed		64	PROP_P3.HD1.GENE3.CB.CLOSED	PORT3_HD1		2
289	23/09/2010 02:25:41	524288	C motor limitation by frequency	3	524288	PROP_S4.HD1.FROMPEC.FLT1027	STBD4_HD1	1	2
329	23/09/2010 02:25:41	Etat à 0	Generator 2 CB closed		64	PROP_S4.HD1.GENE2.CB.CLOSED	STBD4_HD1		2
330	23/09/2010 02:25:41	Etat à 0	Generator 3 CB closed		64	PROP_S4.HD1.GENE3.CB.CLOSED	STBD4_HD1		2
290	23/09/2010 02:25:41	524288	C motor limitation by frequency	3	524288	PROP_S4.HD2.FROMPEC.FLT1027	STBD4_HD2	1	2
332	23/09/2010 02:25:41	Etat à 0	Generator 2 CB closed		64	PROP_S4.HD2.GENE2.CB.CLOSED	STBD4_HD2		2
333	23/09/2010 02:25:41	Etat à 0	Generator 3 CB closed		64	PROP_S4.HD2.GENE3.CB.CLOSED	STBD4_HD2		2
296	23/09/2010 02:25:41	262144	C motor limitation by frequency	5	262144	PROP_S2.HD2.FROMPEC.FLT1027	STBD2_HD2	1	2
336	23/09/2010 02:25:41	Etat à 0	Generator 2 CB closed		64	PROP_S2.HD2.GENE2.CB.CLOSED	STBD2_HD2		2
337	23/09/2010 02:25:41	Etat à 0	Generator 3 CB closed		64	PROP_S2.HD2.GENE3.CB.CLOSED	STBD2_HD2		2
299	23/09/2010 02:25:41	262144	C motor limitation by frequency	5	262144	PROP_P1.HD1.FROMPEC.FLT1027	PORT1_HD1	1	2
338	23/09/2010 02:25:41	Etat à 0	Generator 2 CB closed		64	PROP_P1.HD1.GENE2.CB.CLOSED	PORT1_HD1		2
339	23/09/2010 02:25:41	Etat à 0	Generator 3 CB closed		64	PROP_P1.HD1.GENE3.CB.CLOSED	PORT1_HD1		2
304	23/09/2010 02:25:41	262144	C motor limitation by frequency	5	262144	PROP_S2.HD1.FROMPEC.FLT1027	STBD2_HD1	1	2
303	23/09/2010 02:25:41	262144	C motor limitation by frequency	5	262144	PROP_P1.HD2.FROMPEC.FLT1027	PORT1_HD2	1	2
305	23/09/2010 02:25:41	262144	C motor limitation by frequency	5	262144	PROP_P3.HD2.FROMPEC.FLT1027	PORT3_HD2	1	2
314	23/09/2010 02:25:41	262144	C motor limitation by frequency	5	262144	PROP_P3.HD1.FROMPEC.FLT1027	PORT3_HD1	1	2
309	23/09/2010 02:25:42	262144	C motor limitation by frequency	5	262144	PROP_S4.HD1.FROMPEC.FLT1027	STBD4_HD1	1	2
310	23/09/2010 02:25:42	262144	C motor limitation by frequency	5	262144	PROP_S4.HD2.FROMPEC.FLT1027	STBD4_HD2	1	2
311	23/09/2010 02:25:42	524288	C motor limitation by voltage	3	524288	PROP_S4.HD2.FROMPEC.FLT1028	STBD4_HD2	1	2
361	23/09/2010 02:25:42	Etat à 1	Motor fan 2 ON	1	512	PROP_P1.HD1.MOTOR.FAN 2.ON	PORT1_HD1		2
320	23/09/2010 02:25:42	524288	C motor limitation by voltage	3	524288	PROP_S2.HD1.FROMPEC.FLT1028	STBD2_HD1	1	2
321	23/09/2010 02:25:42	524288	C motor limitation by voltage	3	524288	PROP_P1.HD2.FROMPEC.FLT1028	PORT1_HD2	1	2
326	23/09/2010 02:25:42	524288	C motor limitation by voltage	3	524288	PROP_P3.HD2.FROMPEC.FLT1028	PORT3_HD2	1	2
331	23/09/2010 02:25:43	262144	C motor limitation by voltage	5	262144	PROP_S4.HD2.FROMPEC.FLT1028	STBD4_HD2	1	2
340	23/09/2010 02:25:43	262144	C motor limitation by voltage	5	262144	PROP_P1.HD2.FROMPEC.FLT1028	PORT1_HD2	1	2
341	23/09/2010 02:25:43	262144	C motor limitation by voltage	5	262144	PROP_P3.HD2.FROMPEC.FLT1028	PORT3_HD2	1	2
346	23/09/2010 02:25:43	524288	C motor limitation by voltage	3	524288	PROP_P3.HD1.FROMPEC.FLT1028	PORT3_HD1	1	2
345	23/09/2010 02:25:43	524288	C speed ref <> 0 to start propulsion	3	524288	PROP_P3.HD1.FROMPEC.FLT0821	PORT3_HD1	1	2
344	23/09/2010 02:25:43	524288	E regulation locking FT	3	524288	PROP_P3.HD1.FROMPEC.FLT0357	PORT3_HD1	2	2
343	23/09/2010 02:25:43	524288	E undervoltage	3	524288	PROP_P3.HD1.FROMPEC.FLT0354	PORT3_HD1	1	2
392	23/09/2010 02:25:43	Etat à 1	Half drive tripping lamp	1	512	PROP_P3.HD1.RBANNER.TRIP	PORT3_HD1		2
342	23/09/2010 02:25:43	524288	NB undervoltage	3	524288	PROP_P3.HD1.FROMPEC.FLT0212	PORT3_HD1	1	2
391	23/09/2010 02:25:43	Etat à 1	Propulsion seq.OFF	1	512	PROP_P3.HD1.RBANNER.PROP.OFF	PORT3_HD1		2
351	23/09/2010 02:25:44	524288	C motor limitation by voltage	3	524288	PROP_S4.HD1.FROMPEC.FLT1028	STBD4_HD1	1	2
350	23/09/2010 02:25:44	524288	C speed ref <> 0 to start propulsion	3	524288	PROP_S4.HD1.FROMPEC.FLT0821	STBD4_HD1	1	2
349	23/09/2010 02:25:44	524288	E gate control FT	3	524288	PROP_S4.HD1.FROMPEC.FLT0356	STBD4_HD1	2	2
348	23/09/2010 02:25:44	524288	E undervoltage	3	524288	PROP_S4.HD1.FROMPEC.FLT0354	STBD4_HD1	1	2
347	23/09/2010 02:25:44	524288	NB undervoltage	3	524288	PROP_S4.HD1.FROMPEC.FLT0212	STBD4_HD1	1	2
393	23/09/2010 02:25:44	Etat à 0	Aft bus tie CB 2 closed (right)		64	PROP_S4.HD2.AFT_BTIE.CB2.CLOSED	STBD4_HD2		2

353	23/09/2010 02:25:44	524288	C motor limitation by voltage	3	524288	PROP_S4.HD2.FROMPEC.FLT1028	STBD4_HD2	1	2
354	23/09/2010 02:25:44	524288	C switchboard supply loss	3	524288	PROP_S4.HD2.FROMPEC.FLT1043	STBD4_HD2	1	2
352	23/09/2010 02:25:44	524288	NB undervoltage	3	524288	PROP_S4.HD2.FROMPEC.FLT0212	STBD4_HD2	1	2
402	23/09/2010 02:25:44	Etat à 0	Aft bus tie CB 2 closed (right)		64	PROP_S2.HD2.AFT_BTIE.CB2.CLOSED	STBD2_HD2		2
358	23/09/2010 02:25:44	524288	C motor limitation by voltage	3	524288	PROP_S2.HD2.FROMPEC.FLT1028	STBD2_HD2	1	2
359	23/09/2010 02:25:44	524288	C switchboard supply loss	3	524288	PROP_S2.HD2.FROMPEC.FLT1043	STBD2_HD2	1	2
397	23/09/2010 02:25:44	Etat à 0	Converter pump 1 ON		64	PROP_S2.HD2.CONV_NB.DEION_PP1.ON	STBD2_HD2		2
400	23/09/2010 02:25:44	Etat à 0	Excit CB closed		64	PROP_S2.HD2.EXCIT.CB.CLOSED	STBD2_HD2		2
401	23/09/2010 02:25:44	Etat à 0	Generator 4 CB closed		64	PROP_S2.HD2.GENE4.CB.CLOSED	STBD2_HD2		2
395	23/09/2010 02:25:44	Etat à 1	Half drive tripping lamp	1	512	PROP_S2.HD2.RBANNER.TRIP	STBD2_HD2		2
398	23/09/2010 02:25:44	Etat à 0	Lub DE pump 1 ON		64	PROP_S2.HD2.MOTOR.DE_PP1.ON	STBD2_HD2		2
399	23/09/2010 02:25:44	Etat à 0	Lub NDE pump 1 ON		64	PROP_S2.HD2.MOTOR.NDE_PP1.ON	STBD2_HD2		2
360	23/09/2010 02:25:44	262144	M POD fan 1 ctrl not healthy	5	262144	PROP_S2.HD2.FROMPEC.FLT1221	STBD2_HD2	1	2
356	23/09/2010 02:25:44	524288	NB NB1 gate control FT	3	524288	PROP_S2.HD2.FROMPEC.FLT0214	STBD2_HD2	2	2
357	23/09/2010 02:25:44	524288	NB NB2 gate control FT	3	524288	PROP_S2.HD2.FROMPEC.FLT0228	STBD2_HD2	2	2
355	23/09/2010 02:25:44	524288	NB undervoltage	3	524288	PROP_S2.HD2.FROMPEC.FLT0212	STBD2_HD2	1	2
394	23/09/2010 02:25:44	Etat à 1	Propulsion seq.OFF	1	512	PROP_S2.HD2.RBANNER.PROP.OFF	STBD2_HD2		2
396	23/09/2010 02:25:44	Etat à 0	Transfo auxil 1 ON		64	PROP_S2.HD2.TRANSF1.AUX1.ON	STBD2_HD2		2
365	23/09/2010 02:25:44	524288	C motor limitation by voltage	3	524288	PROP_P1.HD1.FROMPEC.FLT1028	PORT1_HD1	1	2
366	23/09/2010 02:25:44	524288	C switchboard supply loss	3	524288	PROP_P1.HD1.FROMPEC.FLT1043	PORT1_HD1	1	2
364	23/09/2010 02:25:44	524288	E regulation locking FT	3	524288	PROP_P1.HD1.FROMPEC.FLT0357	PORT1_HD1	2	2
363	23/09/2010 02:25:44	524288	E undervoltage	3	524288	PROP_P1.HD1.FROMPEC.FLT0354	PORT1_HD1	1	2
367	23/09/2010 02:25:44	262144	M POD fan 1 ctrl not healthy	5	262144	PROP_P1.HD1.FROMPEC.FLT1221	PORT1_HD1	1	2
362	23/09/2010 02:25:44	524288	NB undervoltage	3	524288	PROP_P1.HD1.FROMPEC.FLT0212	PORT1_HD1	1	2
421	23/09/2010 02:25:44	Etat à 0	Aft bus tie CB 2 closed (right)		64	PROP_P1.HD1.AFT_BTIE.CB2.CLOSED	PORT1_HD1		2
412	23/09/2010 02:25:44	Etat à 1	Auxiliaries seq.OFF	1	512	PROP_P1.HD1.RBANNER.AUX.OFF	PORT1_HD1		2
416	23/09/2010 02:25:44	Etat à 0	Converter pump 1 ON		64	PROP_P1.HD1.CONV_NB.DEION_PP1.ON	PORT1_HD1		2
419	23/09/2010 02:25:44	Etat à 0	Excit CB closed		64	PROP_P1.HD1.EXCIT.CB.CLOSED	PORT1_HD1		2
420	23/09/2010 02:25:44	Etat à 0	Generator 4 CB closed		64	PROP_P1.HD1.GENE4.CB.CLOSED	PORT1_HD1		2
414	23/09/2010 02:25:44	Etat à 1	Half drive tripping lamp	1	512	PROP_P1.HD1.RBANNER.TRIP	PORT1_HD1		2
417	23/09/2010 02:25:44	Etat à 0	Lub DE pump 1 ON		64	PROP_P1.HD1.MOTOR.DE_PP1.ON	PORT1_HD1		2
418	23/09/2010 02:25:44	Etat à 0	Lub NDE pump 1 ON		64	PROP_P1.HD1.MOTOR.NDE_PP1.ON	PORT1_HD1		2
413	23/09/2010 02:25:44	Etat à 1	Propulsion seq.OFF	1	512	PROP_P1.HD1.RBANNER.PROP.OFF	PORT1_HD1		2
415	23/09/2010 02:25:44	Etat à 0	Transfo auxil 1 ON		64	PROP_P1.HD1.TRANSF1.AUX1.ON	PORT1_HD1		2
409	23/09/2010 02:25:44	Etat à 0	Val 1 : Remote ctrl		64	PROP_P1.HD1.REM_CTRL.VAL	PORT1_HD1		2
410	23/09/2010 02:25:44	Etat à 0	Val 2 : Excit master		64	PROP_P1.HD1.EXCIT.VAL	PORT1_HD1		2
411	23/09/2010 02:25:44	Etat à 0	Val 6 : Speed meas		64	PROP_P1.HD1.SPEED_MEAS.VAL	PORT1_HD1		2
435	23/09/2010 02:25:44	Etat à 0	Aft bus tie CB 2 closed (right)		64	PROP_S2.HD1.AFT_BTIE.CB2.CLOSED	STBD2_HD1		2
423	23/09/2010 02:25:44	Etat à 1	Auxiliaries seq.OFF	1	512	PROP_S2.HD1.RBANNER.AUX.OFF	STBD2_HD1		2
374	23/09/2010 02:25:44	262144	C motor limitation by voltage	5	262144	PROP_S2.HD1.FROMPEC.FLT1028	STBD2_HD1	1	2
373	23/09/2010 02:25:44	524288	C speed ref <> 0 to start propulsion	3	524288	PROP_S2.HD1.FROMPEC.FLT0821	STBD2_HD1	1	2
375	23/09/2010 02:25:44	524288	C switchboard supply loss	3	524288	PROP_S2.HD1.FROMPEC.FLT1043	STBD2_HD1	1	2
427	23/09/2010 02:25:44	Etat à 0	Converter pump 1 ON		64	PROP_S2.HD1.CONV_NB.DEION_PP1.ON	STBD2_HD1		2
372	23/09/2010 02:25:44	524288	E gate control FT	3	524288	PROP_S2.HD1.FROMPEC.FLT0356	STBD2_HD1	2	2
371	23/09/2010 02:25:44	524288	E undervoltage	3	524288	PROP_S2.HD1.FROMPEC.FLT0354	STBD2_HD1	1	2
433	23/09/2010 02:25:44	Etat à 0	Excit CB closed		64	PROP_S2.HD1.EXCIT.CB.CLOSED	STBD2_HD1		2
434	23/09/2010 02:25:44	Etat à 0	Generator 4 CB closed		64	PROP_S2.HD1.GENE4.CB.CLOSED	STBD2_HD1		2
425	23/09/2010 02:25:44	Etat à 1	Half drive tripping lamp	1	512	PROP_S2.HD1.RBANNER.TRIP	STBD2_HD1		2
430	23/09/2010 02:25:44	Etat à 0	Lub DE pump 1 ON		64	PROP_S2.HD1.MOTOR.DE_PP1.ON	STBD2_HD1		2
431	23/09/2010 02:25:44	Etat à 0	Lub NDE pump 1 ON		64	PROP_S2.HD1.MOTOR.NDE_PP1.ON	STBD2_HD1		2
428	23/09/2010 02:25:44	Etat à 0	Motor fan 1 ON		64	PROP_S2.HD1.MOTOR.FAN 1.ON	STBD2_HD1		2

429	23/09/2010	02:25:44	Etat à 0	Motor fan 2 ON		64	PROP_S2.HD1.MOTOR.FAN 2.ON	STBD2_HD1		2
369	23/09/2010	02:25:44	524288	NB NB1 gate control FT	3	524288	PROP_S2.HD1.FROMPEC.FLT0214	STBD2_HD1	2	2
370	23/09/2010	02:25:44	524288	NB NB2 gate control FT	3	524288	PROP_S2.HD1.FROMPEC.FLT0228	STBD2_HD1	2	2
368	23/09/2010	02:25:44	524288	NB undervoltage	3	524288	PROP_S2.HD1.FROMPEC.FLT0212	STBD2_HD1	1	2
424	23/09/2010	02:25:44	Etat à 1	Propulsion seq.OFF	1	512	PROP_S2.HD1.RBANNER.PROP.OFF	STBD2_HD1		2
426	23/09/2010	02:25:44	Etat à 0	Transfo auxil 1 ON		64	PROP_S2.HD1.TRANSF1.AUX1.ON	STBD2_HD1		2
432	23/09/2010	02:25:44	Etat à 0	Transfo CB closed		64	PROP_S2.HD1.TRANSF1.CB.CLOSED	STBD2_HD1		2
450	23/09/2010	02:25:44	Etat à 0	Aft bus tie CB 2 closed (right)		64	PROP_P1.HD2.AFT_BTIE.CB2.CLOSED	PORT1_HD2		2
442	23/09/2010	02:25:44	Etat à 1	Auxiliaries seq.OFF	1	512	PROP_P1.HD2.RBANNER.AUX.OFF	PORT1_HD2		2
377	23/09/2010	02:25:44	524288	C switchboard supply loss	3	524288	PROP_P1.HD2.FROMPEC.FLT1043	PORT1_HD2	1	2
444	23/09/2010	02:25:44	Etat à 0	Converter pump 1 ON		64	PROP_P1.HD2.CONV_NB.DEION_PP1.ON	PORT1_HD2		2
449	23/09/2010	02:25:44	Etat à 0	Generator 4 CB closed		64	PROP_P1.HD2.GENE4.CB.CLOSED	PORT1_HD2		2
445	23/09/2010	02:25:44	Etat à 0	Lub DE pump 1 ON		64	PROP_P1.HD2.MOTOR.DE_PP1.ON	PORT1_HD2		2
446	23/09/2010	02:25:44	Etat à 0	Lub NDE pump 1 ON		64	PROP_P1.HD2.MOTOR.NDE_PP1.ON	PORT1_HD2		2
378	23/09/2010	02:25:44	Etat à 0	Motor fan 2 ON		64	PROP_P1.HD2.MOTOR.FAN 2.ON	PORT1_HD2		2
376	23/09/2010	02:25:44	524288	NB undervoltage	3	524288	PROP_P1.HD2.FROMPEC.FLT0212	PORT1_HD2	1	2
443	23/09/2010	02:25:44	Etat à 0	Transfo auxil 1 ON		64	PROP_P1.HD2.TRANSF1.AUX1.ON	PORT1_HD2		2
464	23/09/2010	02:25:44	Etat à 0	Aft bus tie CB 2 closed (right)		64	PROP_P3.HD2.AFT_BTIE.CB2.CLOSED	PORT3_HD2		2
458	23/09/2010	02:25:44	Etat à 1	Auxiliaries seq.OFF	1	512	PROP_P3.HD2.RBANNER.AUX.OFF	PORT3_HD2		2
380	23/09/2010	02:25:44	524288	C switchboard supply loss	3	524288	PROP_P3.HD2.FROMPEC.FLT1043	PORT3_HD2	1	2
460	23/09/2010	02:25:44	Etat à 0	Converter pump 1 ON		64	PROP_P3.HD2.CONV_NB.DEION_PP1.ON	PORT3_HD2		2
463	23/09/2010	02:25:44	Etat à 0	Generator 4 CB closed		64	PROP_P3.HD2.GENE4.CB.CLOSED	PORT3_HD2		2
461	23/09/2010	02:25:44	Etat à 0	Lub DE pump 1 ON		64	PROP_P3.HD2.MOTOR.DE_PP1.ON	PORT3_HD2		2
462	23/09/2010	02:25:44	Etat à 0	Lub NDE pump 1 ON		64	PROP_P3.HD2.MOTOR.NDE_PP1.ON	PORT3_HD2		2
379	23/09/2010	02:25:44	524288	NB undervoltage	3	524288	PROP_P3.HD2.FROMPEC.FLT0212	PORT3_HD2	1	2
459	23/09/2010	02:25:44	Etat à 0	Transfo auxil 1 ON		64	PROP_P3.HD2.TRANSF1.AUX1.ON	PORT3_HD2		2
484	23/09/2010	02:25:44	Etat à 0	Aft bus tie CB 2 closed (right)		64	PROP_P3.HD1.AFT_BTIE.CB2.CLOSED	PORT3_HD1		2
476	23/09/2010	02:25:44	Etat à 1	Auxiliaries seq.OFF	1	512	PROP_P3.HD1.RBANNER.AUX.OFF	PORT3_HD1		2
382	23/09/2010	02:25:44	262144	C motor limitation by voltage	5	262144	PROP_P3.HD1.FROMPEC.FLT1028	PORT3_HD1	1	2
381	23/09/2010	02:25:44	262144	C speed ref <> 0 to start propulsion	5	262144	PROP_P3.HD1.FROMPEC.FLT0821	PORT3_HD1	1	2
383	23/09/2010	02:25:44	524288	C switchboard supply loss	3	524288	PROP_P3.HD1.FROMPEC.FLT1043	PORT3_HD1	1	2
478	23/09/2010	02:25:44	Etat à 0	Converter pump 1 ON		64	PROP_P3.HD1.CONV_NB.DEION_PP1.ON	PORT3_HD1		2
482	23/09/2010	02:25:44	Etat à 0	Excit CB closed		64	PROP_P3.HD1.EXCIT.CB.CLOSED	PORT3_HD1		2
483	23/09/2010	02:25:44	Etat à 0	Generator 4 CB closed		64	PROP_P3.HD1.GENE4.CB.CLOSED	PORT3_HD1		2
480	23/09/2010	02:25:44	Etat à 0	Lub DE pump 1 ON		64	PROP_P3.HD1.MOTOR.DE_PP1.ON	PORT3_HD1		2
481	23/09/2010	02:25:44	Etat à 0	Lub NDE pump 1 ON		64	PROP_P3.HD1.MOTOR.NDE_PP1.ON	PORT3_HD1		2
479	23/09/2010	02:25:44	Etat à 0	Motor fan 1 ON		64	PROP_P3.HD1.MOTOR.FAN 1.ON	PORT3_HD1		2
477	23/09/2010	02:25:44	Etat à 0	Transfo auxil 1 ON		64	PROP_P3.HD1.TRANSF1.AUX1.ON	PORT3_HD1		2
465	23/09/2010	02:25:44	Etat à 0	Val 1 : Remote ctrl		64	PROP_P3.HD1.REM_CTRL.VAL	PORT3_HD1		2
474	23/09/2010	02:25:44	Etat à 0	Val 3 : Steer.rem.ctrl		64	PROP_P3.HD1.REM_CTRL.S_VAL	PORT3_HD1		2
511	23/09/2010	02:25:45	Etat à 0	Aft bus tie CB 2 closed (right)		64	PROP_S4.HD1.AFT_BTIE.CB2.CLOSED	STBD4_HD1		2
492	23/09/2010	02:25:45	Etat à 1	Auxiliaries seq.OFF	1	512	PROP_S4.HD1.RBANNER.AUX.OFF	STBD4_HD1		2
385	23/09/2010	02:25:45	262144	C motor limitation by voltage	5	262144	PROP_S4.HD1.FROMPEC.FLT1028	STBD4_HD1	1	2
384	23/09/2010	02:25:45	262144	C speed ref <> 0 to start propulsion	5	262144	PROP_S4.HD1.FROMPEC.FLT0821	STBD4_HD1	1	2
386	23/09/2010	02:25:45	524288	C switchboard supply loss	3	524288	PROP_S4.HD1.FROMPEC.FLT1043	STBD4_HD1	1	2
496	23/09/2010	02:25:45	Etat à 0	Converter pump 1 ON		64	PROP_S4.HD1.CONV_NB.DEION_PP1.ON	STBD4_HD1		2
509	23/09/2010	02:25:45	Etat à 0	Excit CB closed		64	PROP_S4.HD1.EXCIT.CB.CLOSED	STBD4_HD1		2
510	23/09/2010	02:25:45	Etat à 0	Generator 4 CB closed		64	PROP_S4.HD1.GENE4.CB.CLOSED	STBD4_HD1		2
494	23/09/2010	02:25:45	Etat à 1	Half drive tripping lamp	1	512	PROP_S4.HD1.RBANNER.TRIP	STBD4_HD1		2
498	23/09/2010	02:25:45	Etat à 0	Lub DE pump 1 ON		64	PROP_S4.HD1.MOTOR.DE_PP1.ON	STBD4_HD1		2
508	23/09/2010	02:25:45	Etat à 0	Lub NDE pump 1 ON		64	PROP_S4.HD1.MOTOR.NDE_PP1.ON	STBD4_HD1		2

497	23/09/2010 02:25:45	Etat à 0	Motor fan 1 ON		64	PROP_S4.HD1.MOTOR.FAN 1.ON	STBD4_HD1		2
493	23/09/2010 02:25:45	Etat à 1	Propulsion seq.OFF	1	512	PROP_S4.HD1.RBANNER.PROP.OFF	STBD4_HD1		2
495	23/09/2010 02:25:45	Etat à 0	Transfo auxil 1 ON		64	PROP_S4.HD1.TRANSF1.AUX1.ON	STBD4_HD1		2
488	23/09/2010 02:25:45	Etat à 0	Val 1 : Remote ctrl		64	PROP_S4.HD1.REM_CTRL.VAL	STBD4_HD1		2
490	23/09/2010 02:25:45	Etat à 0	Val 3 : Steer.rem.ctrl		64	PROP_S4.HD1.REM_CTRL.S_VAL	STBD4_HD1		2
517	23/09/2010 02:25:45	Etat à 1	Auxiliaries seq.OFF	1	512	PROP_S4.HD2.RBANNER.AUX.OFF	STBD4_HD2		2
387	23/09/2010 02:25:45	262144	C motor limitation by voltage	5	262144	PROP_S4.HD2.FROMPEC.FLT1028	STBD4_HD2	1	2
519	23/09/2010 02:25:45	Etat à 0	Converter pump 1 ON		64	PROP_S4.HD2.CONV_NB.DEION_PP1.ON	STBD4_HD2		2
523	23/09/2010 02:25:45	Etat à 0	Generator 4 CB closed		64	PROP_S4.HD2.GENE4.CB.CLOSED	STBD4_HD2		2
521	23/09/2010 02:25:45	Etat à 0	Lub DE pump 1 ON		64	PROP_S4.HD2.MOTOR.DE_PP1.ON	STBD4_HD2		2
522	23/09/2010 02:25:45	Etat à 0	Lub NDE pump 1 ON		64	PROP_S4.HD2.MOTOR.NDE_PP1.ON	STBD4_HD2		2
520	23/09/2010 02:25:45	Etat à 0	Motor fan 1 ON		64	PROP_S4.HD2.MOTOR.FAN 1.ON	STBD4_HD2		2
518	23/09/2010 02:25:45	Etat à 0	Transfo auxil 1 ON		64	PROP_S4.HD2.TRANSF1.AUX1.ON	STBD4_HD2		2
525	23/09/2010 02:25:45	Etat à 1	Auxiliaries seq.OFF	1	512	PROP_S2.HD2.RBANNER.AUX.OFF	STBD2_HD2		2
389	23/09/2010 02:25:45	262144	C motor limitation by voltage	5	262144	PROP_S2.HD2.FROMPEC.FLT1028	STBD2_HD2	1	2
388	23/09/2010 02:25:45	524288	C speed ref <> 0 to start propulsion	3	524288	PROP_S2.HD2.FROMPEC.FLT0821	STBD2_HD2	1	2
526	23/09/2010 02:25:45	Etat à 0	Motor fan 1 ON		64	PROP_S2.HD2.MOTOR.FAN 1.ON	STBD2_HD2		2
527	23/09/2010 02:25:45	Etat à 0	Motor fan 2 ON		64	PROP_S2.HD2.MOTOR.FAN 2.ON	STBD2_HD2		2
528	23/09/2010 02:25:45	Etat à 0	Transfo CB closed		64	PROP_S2.HD2.TRANSF1.CB.CLOSED	STBD2_HD2		2
390	23/09/2010 02:25:45	262144	C motor limitation by voltage	5	262144	PROP_P1.HD1.FROMPEC.FLT1028	PORT1_HD1	1	2
529	23/09/2010 02:25:45	Etat à 0	Motor fan 1 ON		64	PROP_P1.HD1.MOTOR.FAN 1.ON	PORT1_HD1		2
530	23/09/2010 02:25:45	Etat à 0	Motor fan 2 ON		64	PROP_P1.HD1.MOTOR.FAN 2.ON	PORT1_HD1		2
532	23/09/2010 02:25:45	Etat à 0	Motor fan 1 ON		64	PROP_P1.HD2.MOTOR.FAN 1.ON	PORT1_HD2		2
534	23/09/2010 02:25:45	Etat à 0	Motor fan 1 ON		64	PROP_P3.HD2.MOTOR.FAN 1.ON	PORT3_HD2		2
535	23/09/2010 02:25:45	Etat à 0	Transfo CB closed		64	PROP_P3.HD1.TRANSF1.CB.CLOSED	PORT3_HD1		2
403	23/09/2010 02:25:46	524288	C alarm by POD steering	3	524288	PROP_S4.HD1.FROMPEC.FLT1040	STBD4_HD1	1	2
404	23/09/2010 02:25:46	524288	CLS system warning	3	524288	PROP_S4.HD1.FROMPEC_S.SFT0096	STBD4_HD1	1	2
407	23/09/2010 02:25:46	524288	C alarm by POD steering	3	524288	PROP_S4.HD2.FROMPEC.FLT1040	STBD4_HD2	1	2
406	23/09/2010 02:25:46	524288	C speed ref <> 0 to start propulsion	3	524288	PROP_S4.HD2.FROMPEC.FLT0821	STBD4_HD2	1	2
408	23/09/2010 02:25:46	524288	CLS system warning	3	524288	PROP_S4.HD2.FROMPEC_S.SFT0096	STBD4_HD2	1	2
405	23/09/2010 02:25:46	524288	T circuit breaker electric FT	3	524288	PROP_S4.HD2.TRANSF1.CB.FAULT	STBD4_HD2	2	2
422	23/09/2010 02:25:46	524288	C speed ref <> 0 to start propulsion	3	524288	PROP_P1.HD1.FROMPEC.FLT0821	PORT1_HD1	1	2
538	23/09/2010 02:25:46	Etat à 1	generating mode	1	512	PROP_P1.HD1.GENEMODE.ON	PORT1_HD1		2
539	23/09/2010 02:25:46	Etat à 0	Transfo CB closed		64	PROP_P1.HD1.TRANSF1.CB.CLOSED	PORT1_HD1		2
536	23/09/2010 02:25:46	Etat à 1	Val 2 : Excit master	1	512	PROP_P1.HD1.EXCIT.VAL	PORT1_HD1		2
537	23/09/2010 02:25:46	Etat à 1	Val 6 : Speed meas	1	512	PROP_P1.HD1.SPEED_MEAS.VAL	PORT1_HD1		2
437	23/09/2010 02:25:46	524288	C speed ref <> 0 to start propulsion	3	524288	PROP_P1.HD2.FROMPEC.FLT0821	PORT1_HD2	1	2
544	23/09/2010 02:25:46	Etat à 0	Excit CB closed		64	PROP_P1.HD2.EXCIT.CB.CLOSED	PORT1_HD2		2
542	23/09/2010 02:25:46	Etat à 1	generating mode	1	512	PROP_P1.HD2.GENEMODE.ON	PORT1_HD2		2
541	23/09/2010 02:25:46	Etat à 1	Half drive tripping lamp	1	512	PROP_P1.HD2.RBANNER.TRIP	PORT1_HD2		2
540	23/09/2010 02:25:46	Etat à 1	Propulsion seq.OFF	1	512	PROP_P1.HD2.RBANNER.PROP.OFF	PORT1_HD2		2
436	23/09/2010 02:25:46	524288	T circuit breaker electric FT	3	524288	PROP_P1.HD2.TRANSF1.CB.FAULT	PORT1_HD2	2	2
543	23/09/2010 02:25:46	Etat à 0	Transfo CB closed		64	PROP_P1.HD2.TRANSF1.CB.CLOSED	PORT1_HD2		2
440	23/09/2010 02:25:46	Etat à 0	Val 2 : Excit master		64	PROP_P1.HD2.EXCIT.VAL	PORT1_HD2		2
441	23/09/2010 02:25:46	Etat à 0	Val 6 : Speed meas		64	PROP_P1.HD2.SPEED_MEAS.VAL	PORT1_HD2		2
439	23/09/2010 02:25:46	524288	C speed ref <> 0 to start propulsion	3	524288	PROP_P3.HD2.FROMPEC.FLT0821	PORT3_HD2	1	2
549	23/09/2010 02:25:46	Etat à 0	Excit CB closed		64	PROP_P3.HD2.EXCIT.CB.CLOSED	PORT3_HD2		2
547	23/09/2010 02:25:46	Etat à 1	generating mode	1	512	PROP_P3.HD2.GENEMODE.ON	PORT3_HD2		2
546	23/09/2010 02:25:46	Etat à 1	Half drive tripping lamp	1	512	PROP_P3.HD2.RBANNER.TRIP	PORT3_HD2		2
545	23/09/2010 02:25:46	Etat à 1	Propulsion seq.OFF	1	512	PROP_P3.HD2.RBANNER.PROP.OFF	PORT3_HD2		2
438	23/09/2010 02:25:46	524288	T circuit breaker electric FT	3	524288	PROP_P3.HD2.TRANSF1.CB.FAULT	PORT3_HD2	2	2

548	23/09/2010	02:25:46	Etat à 0	Transfo CB closed		64	PROP_P3.HD2.TRANSF1.CB.CLOSED	PORT3_HD2		2
456	23/09/2010	02:25:46	Etat à 0	Val 2 : Excit master		64	PROP_P3.HD2.EXCIT.VAL	PORT3_HD2		2
457	23/09/2010	02:25:46	Etat à 0	Val 6 : Speed meas		64	PROP_P3.HD2.SPEED_MEAS.VAL	PORT3_HD2		2
448	23/09/2010	02:25:46	524288	C speed ref <> 0 to start propulsion	3	524288	PROP_P3.HD1.FROMPEC.FLT0821	PORT3_HD1	1	2
551	23/09/2010	02:25:46	Etat à 1	generating mode	1	512	PROP_P3.HD1.GENEMODE.ON	PORT3_HD1		2
473	23/09/2010	02:25:46	Etat à 1	Val 2 : Excit master	1	512	PROP_P3.HD1.EXCIT.VAL	PORT3_HD1		2
475	23/09/2010	02:25:46	Etat à 1	Val 6 : Speed meas	1	512	PROP_P3.HD1.SPEED_MEAS.VAL	PORT3_HD1		2
447	23/09/2010	02:25:47	524288	C speed ref <> 0 to start propulsion	3	524288	PROP_S4.HD1.FROMPEC.FLT0821	STBD4_HD1	1	2
550	23/09/2010	02:25:47	Etat à 0	Transfo CB closed		64	PROP_S4.HD1.TRANSF1.CB.CLOSED	STBD4_HD1		2
489	23/09/2010	02:25:47	Etat à 1	Val 2 : Excit master	1	512	PROP_S4.HD1.EXCIT.VAL	STBD4_HD1		2
491	23/09/2010	02:25:47	Etat à 1	Val 6 : Speed meas	1	512	PROP_S4.HD1.SPEED_MEAS.VAL	STBD4_HD1		2
555	23/09/2010	02:25:47	Etat à 0	Excit CB closed		64	PROP_S4.HD2.EXCIT.CB.CLOSED	STBD4_HD2		2
553	23/09/2010	02:25:47	Etat à 1	Half drive tripping lamp	1	512	PROP_S4.HD2.RBANNER.TRIP	STBD4_HD2		2
552	23/09/2010	02:25:47	Etat à 1	Propulsion seq.OFF	1	512	PROP_S4.HD2.RBANNER.PROP.OFF	STBD4_HD2		2
554	23/09/2010	02:25:47	Etat à 0	Transfo CB closed		64	PROP_S4.HD2.TRANSF1.CB.CLOSED	STBD4_HD2		2
515	23/09/2010	02:25:47	Etat à 0	Val 2 : Excit master		64	PROP_S4.HD2.EXCIT.VAL	STBD4_HD2		2
516	23/09/2010	02:25:47	Etat à 0	Val 6 : Speed meas		64	PROP_S4.HD2.SPEED_MEAS.VAL	STBD4_HD2		2
451	23/09/2010	02:25:47	524288	M mot DE bear. lub. Oil heat feedbak FT	3	524288	PROP_S2.HD2.MOTOR.DE_HEAT.FAULT	STBD2_HD2	1	2
452	23/09/2010	02:25:47	524288	M mot NDE bear. lub oil heat feedbak FT	3	524288	PROP_S2.HD2.MOTOR.NDE_HEAT.FAULT	STBD2_HD2	1	2
453	23/09/2010	02:25:47	524288	M POD fan 2 ctrl not healthy	3	524288	PROP_S2.HD2.FROMPEC.FLT1222	STBD2_HD2	1	2
454	23/09/2010	02:25:47	524288	M mot DE bear. lub. Oil heat feedbak FT	3	524288	PROP_P1.HD1.MOTOR.DE_HEAT.FAULT	PORT1_HD1	1	2
455	23/09/2010	02:25:47	524288	M mot NDE bear. lub oil heat feedbak FT	3	524288	PROP_P1.HD1.MOTOR.NDE_HEAT.FAULT	PORT1_HD1	1	2
470	23/09/2010	02:25:47	524288	M mot DE bear. lub. Oil heat feedbak FT	3	524288	PROP_S2.HD1.MOTOR.DE_HEAT.FAULT	STBD2_HD1	1	2
471	23/09/2010	02:25:47	524288	M mot NDE bear. lub oil heat feedbak FT	3	524288	PROP_S2.HD1.MOTOR.NDE_HEAT.FAULT	STBD2_HD1	1	2
472	23/09/2010	02:25:47	524288	M POD fan 2 ctrl not healthy	3	524288	PROP_S2.HD1.FROMPEC.FLT1222	STBD2_HD1	1	2
469	23/09/2010	02:25:47	524288	MB underflux	3	524288	PROP_S2.HD1.FROMPEC.FLT0324	STBD2_HD1	1	2
467	23/09/2010	02:25:47	524288	M mot DE bear. lub. Oil heat feedbak FT	3	524288	PROP_P1.HD2.MOTOR.DE_HEAT.FAULT	PORT1_HD2	1	2
468	23/09/2010	02:25:47	524288	M mot NDE bear. lub oil heat feedbak FT	3	524288	PROP_P1.HD2.MOTOR.NDE_HEAT.FAULT	PORT1_HD2	1	2
466	23/09/2010	02:25:47	524288	MB underflux	3	524288	PROP_P1.HD2.FROMPEC.FLT0324	PORT1_HD2	1	2
487	23/09/2010	02:25:47	524288	ELEC steering emerg power request	3	524288	PROP_P3.HD2.STEER.BRAK_PRESS.SENSOR	PORT3_HD2	2	2
485	23/09/2010	02:25:47	524288	M mot DE bear. lub. Oil heat feedbak FT	3	524288	PROP_P3.HD2.MOTOR.DE_HEAT.FAULT	PORT3_HD2	1	2
486	23/09/2010	02:25:47	524288	M mot NDE bear. lub oil heat feedbak FT	3	524288	PROP_P3.HD2.MOTOR.NDE_HEAT.FAULT	PORT3_HD2	1	2
556	23/09/2010	02:25:47	Etat à 1	Steering fault lamp	1	512	PROP_P3.HD2.RBANNER.STEER.FAULT	PORT3_HD2		2
504	23/09/2010	02:25:47	524288	ELEC steering emerg power request	3	524288	PROP_P3.HD1.STEER.BRAK_PRESS.SENSOR	PORT3_HD1	2	2
502	23/09/2010	02:25:47	524288	M mot DE bear. lub. Oil heat feedbak FT	3	524288	PROP_P3.HD1.MOTOR.DE_HEAT.FAULT	PORT3_HD1	1	2
503	23/09/2010	02:25:47	524288	M mot NDE bear. lub oil heat feedbak FT	3	524288	PROP_P3.HD1.MOTOR.NDE_HEAT.FAULT	PORT3_HD1	1	2
560	23/09/2010	02:25:47	Etat à 1	Steering fault lamp	1	512	PROP_P3.HD1.RBANNER.STEER.FAULT	PORT3_HD1		2
501	23/09/2010	02:25:48	524288	ELEC steering emerg power request	3	524288	PROP_S4.HD1.STEER.BRAK_PRESS.SENSOR	STBD4_HD1	2	2
499	23/09/2010	02:25:48	524288	M mot DE bear. lub. Oil heat feedbak FT	3	524288	PROP_S4.HD1.MOTOR.DE_HEAT.FAULT	STBD4_HD1	1	2
500	23/09/2010	02:25:48	524288	M mot NDE bear. lub oil heat feedbak FT	3	524288	PROP_S4.HD1.MOTOR.NDE_HEAT.FAULT	STBD4_HD1	1	2
559	23/09/2010	02:25:48	Etat à 1	Steering fault lamp	1	512	PROP_S4.HD1.RBANNER.STEER.FAULT	STBD4_HD1		2
507	23/09/2010	02:25:48	524288	ELEC steering emerg power request	3	524288	PROP_S4.HD2.STEER.BRAK_PRESS.SENSOR	STBD4_HD2	2	2
505	23/09/2010	02:25:48	524288	M mot DE bear. lub. Oil heat feedbak FT	3	524288	PROP_S4.HD2.MOTOR.DE_HEAT.FAULT	STBD4_HD2	1	2
506	23/09/2010	02:25:48	524288	M mot NDE bear. lub oil heat feedbak FT	3	524288	PROP_S4.HD2.MOTOR.NDE_HEAT.FAULT	STBD4_HD2	1	2
561	23/09/2010	02:25:48	Etat à 1	Steering fault lamp	1	512	PROP_S4.HD2.RBANNER.STEER.FAULT	STBD4_HD2		2
512	23/09/2010	02:25:48	524288	MB underflux	3	524288	PROP_S2.HD2.FROMPEC.FLT0324	STBD2_HD2	1	2
514	23/09/2010	02:25:48	524288	M POD fan 1 ctrl not healthy	3	524288	PROP_P1.HD1.FROMPEC.FLT1221	PORT1_HD1	1	2
513	23/09/2010	02:25:48	524288	MB underflux	3	524288	PROP_P1.HD1.FROMPEC.FLT0324	PORT1_HD1	1	2
566	23/09/2010	02:25:48	Etat à 1	Val 1 : Remote ctrl	1	512	PROP_P1.HD1.REM_CTRL.VAL	PORT1_HD1		2
524	23/09/2010	02:25:48	524288	M POD fan 1 ctrl not healthy	3	524288	PROP_P1.HD2.FROMPEC.FLT1221	PORT1_HD2	1	2
531	23/09/2010	02:25:48	524288	M POD fan 1 ctrl not healthy	3	524288	PROP_P3.HD2.FROMPEC.FLT1221	PORT3_HD2	1	2

533	23/09/2010 02:25:48	524288	M POD fan 1 ctrl not healthy	3	524288	PROP_P3.HD1.FROMPEC.FLT1221	PORT3_HD1	1	2
569	23/09/2010 02:25:48	Etat à 1	Val 1 : Remote ctrl	1	512	PROP_P3.HD1.REM_CTRL.VAL	PORT3_HD1		2
570	23/09/2010 02:25:48	Etat à 1	Val 3 : Steer.rem.ctrl	1	512	PROP_P3.HD1.REM_CTRL.S_VAL	PORT3_HD1		2
567	23/09/2010 02:25:49	Etat à 1	Val 1 : Remote ctrl	1	512	PROP_S4.HD1.REM_CTRL.VAL	STBD4_HD1		2
568	23/09/2010 02:25:49	Etat à 1	Val 3 : Steer.rem.ctrl	1	512	PROP_S4.HD1.REM_CTRL.S_VAL	STBD4_HD1		2
557	23/09/2010 02:25:50	524288	M POD fan 1 ctrl not healthy	3	524288	PROP_S4.HD1.FROMPEC.FLT1221	STBD4_HD1	1	2
558	23/09/2010 02:25:50	524288	M POD fan 1 ctrl not healthy	3	524288	PROP_S4.HD2.FROMPEC.FLT1221	STBD4_HD2	1	2
562	23/09/2010 02:25:50	524288	M mot tripped by fans FT	3	524288	PROP_S2.HD2.FROMPEC.FLT0450	STBD2_HD2	2	2
563	23/09/2010 02:25:50	524288	M POD fan 1 ctrl not healthy	3	524288	PROP_S2.HD2.FROMPEC.FLT1221	STBD2_HD2	1	2
564	23/09/2010 02:25:50	524288	M mot tripped by fans FT	3	524288	PROP_P1.HD1.FROMPEC.FLT0450	PORT1_HD1	2	2
565	23/09/2010 02:25:50	524288	M POD fan 2 ctrl not healthy	3	524288	PROP_P1.HD1.FROMPEC.FLT1222	PORT1_HD1	1	2
571	23/09/2010 02:25:50	524288	M mot tripped by fans FT	3	524288	PROP_S2.HD1.FROMPEC.FLT0450	STBD2_HD1	2	2
572	23/09/2010 02:25:50	524288	M POD fan 1 ctrl not healthy	3	524288	PROP_S2.HD1.FROMPEC.FLT1221	STBD2_HD1	1	2
573	23/09/2010 02:25:50	524288	M mot tripped by fans FT	3	524288	PROP_P1.HD2.FROMPEC.FLT0450	PORT1_HD2	2	2
574	23/09/2010 02:25:50	524288	M POD fan 2 ctrl not healthy	3	524288	PROP_P1.HD2.FROMPEC.FLT1222	PORT1_HD2	1	2
575	23/09/2010 02:25:51	524288	M mot tripped by fans FT	3	524288	PROP_P3.HD2.FROMPEC.FLT0450	PORT3_HD2	2	2
576	23/09/2010 02:25:51	524288	M POD fan 2 ctrl not healthy	3	524288	PROP_P3.HD2.FROMPEC.FLT1222	PORT3_HD2	1	2
578	23/09/2010 02:25:51	524288	M mot tripped by fans FT	3	524288	PROP_P3.HD1.FROMPEC.FLT0450	PORT3_HD1	2	2
579	23/09/2010 02:25:51	524288	M POD fan 2 ctrl not healthy	3	524288	PROP_P3.HD1.FROMPEC.FLT1222	PORT3_HD1	1	2
577	23/09/2010 02:25:52	524288	M POD fan 2 ctrl not healthy	3	524288	PROP_S4.HD1.FROMPEC.FLT1222	STBD4_HD1	1	2
580	23/09/2010 02:25:52	524288	M mot tripped by fans FT	3	524288	PROP_S4.HD2.FROMPEC.FLT0450	STBD4_HD2	2	2
581	23/09/2010 02:25:52	524288	M POD fan 2 ctrl not healthy	3	524288	PROP_S4.HD2.FROMPEC.FLT1222	STBD4_HD2	1	2
582	23/09/2010 02:25:53	524288	M mot tripped by fans FT	3	524288	PROP_S4.HD1.FROMPEC.FLT0450	STBD4_HD1	2	2
583	23/09/2010 02:25:54	262144	T circuit breaker electric FT	5	262144	PROP_S4.HD2.TRANSF1.CB.FAULT	STBD4_HD2	2	2
584	23/09/2010 02:25:54	262144	T circuit breaker electric FT	5	262144	PROP_P1.HD2.TRANSF1.CB.FAULT	PORT1_HD2	2	2
585	23/09/2010 02:25:54	262144	T circuit breaker electric FT	5	262144	PROP_P3.HD2.TRANSF1.CB.FAULT	PORT3_HD2	2	2
588	23/09/2010 02:25:54	262144	E regulation locking FT	5	262144	PROP_P3.HD1.FROMPEC.FLT0357	PORT3_HD1	2	2
587	23/09/2010 02:25:54	262144	E undervoltage	5	262144	PROP_P3.HD1.FROMPEC.FLT0354	PORT3_HD1	1	2
586	23/09/2010 02:25:54	262144	NB undervoltage	5	262144	PROP_P3.HD1.FROMPEC.FLT0212	PORT3_HD1	1	2
589	23/09/2010 02:25:55	262144	NB undervoltage	5	262144	PROP_S4.HD2.FROMPEC.FLT0212	STBD4_HD2	1	2
593	23/09/2010 02:25:55	262144	MB underflux	5	262144	PROP_S2.HD2.FROMPEC.FLT0324	STBD2_HD2	1	2
591	23/09/2010 02:25:55	262144	NB NB1 gate control FT	5	262144	PROP_S2.HD2.FROMPEC.FLT0214	STBD2_HD2	2	2
592	23/09/2010 02:25:55	262144	NB NB2 gate control FT	5	262144	PROP_S2.HD2.FROMPEC.FLT0228	STBD2_HD2	2	2
590	23/09/2010 02:25:55	262144	NB undervoltage	5	262144	PROP_S2.HD2.FROMPEC.FLT0212	STBD2_HD2	1	2
597	23/09/2010 02:25:55	262144	E regulation locking FT	5	262144	PROP_P1.HD1.FROMPEC.FLT0357	PORT1_HD1	2	2
596	23/09/2010 02:25:55	262144	E undervoltage	5	262144	PROP_P1.HD1.FROMPEC.FLT0354	PORT1_HD1	1	2
595	23/09/2010 02:25:55	262144	MB underflux	5	262144	PROP_P1.HD1.FROMPEC.FLT0324	PORT1_HD1	1	2
594	23/09/2010 02:25:55	262144	NB undervoltage	5	262144	PROP_P1.HD1.FROMPEC.FLT0212	PORT1_HD1	1	2
603	23/09/2010 02:25:55	262144	E gate control FT	5	262144	PROP_S2.HD1.FROMPEC.FLT0356	STBD2_HD1	2	2
602	23/09/2010 02:25:55	262144	E undervoltage	5	262144	PROP_S2.HD1.FROMPEC.FLT0354	STBD2_HD1	1	2
601	23/09/2010 02:25:55	262144	MB underflux	5	262144	PROP_S2.HD1.FROMPEC.FLT0324	STBD2_HD1	1	2
599	23/09/2010 02:25:55	262144	NB NB1 gate control FT	5	262144	PROP_S2.HD1.FROMPEC.FLT0214	STBD2_HD1	2	2
600	23/09/2010 02:25:55	262144	NB NB2 gate control FT	5	262144	PROP_S2.HD1.FROMPEC.FLT0228	STBD2_HD1	2	2
598	23/09/2010 02:25:55	262144	NB undervoltage	5	262144	PROP_S2.HD1.FROMPEC.FLT0212	STBD2_HD1	1	2
605	23/09/2010 02:25:55	262144	MB underflux	5	262144	PROP_P1.HD2.FROMPEC.FLT0324	PORT1_HD2	1	2
604	23/09/2010 02:25:55	262144	NB undervoltage	5	262144	PROP_P1.HD2.FROMPEC.FLT0212	PORT1_HD2	1	2
606	23/09/2010 02:25:55	262144	NB undervoltage	5	262144	PROP_P3.HD2.FROMPEC.FLT0212	PORT3_HD2	1	2
609	23/09/2010 02:25:56	262144	E gate control FT	5	262144	PROP_S4.HD1.FROMPEC.FLT0356	STBD4_HD1	2	2
608	23/09/2010 02:25:56	262144	E undervoltage	5	262144	PROP_S4.HD1.FROMPEC.FLT0354	STBD4_HD1	1	2
607	23/09/2010 02:25:56	262144	NB undervoltage	5	262144	PROP_S4.HD1.FROMPEC.FLT0212	STBD4_HD1	1	2

Annex B

Safety data sheet for dielectric oil Jarylec C 101

01 - IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

NAME OF THE PREPARATION	JARYLEC C 101
RECOMMENDED USES	Dielectric fluid
SDS No	00548
SUPPLIER	ARKEMA Ltd 6270 Bishop's Court Solihull Parkway Birmingham Business Park B37 7YB UNITED KINGDOM Tel: 0121 779 5459
Emergency telephone number	
National Chemical Emergency Centre	Tel: 01865 407 333

02 - COMPOSITION / INFORMATION ON INGREDIENTS

CHEMICAL NATURE OF THE PREPARATION	MIXTURE BASED ON : (PHENYL)(TOLYL)METHANE CAS : 27776-01-8 EINECS : 248-654-8 (PHENYL)(BENZYLTOLYL)METHANE CAS : 26898-17-9 EINECS : 248-097-0 (CYCLOALIPHATIC EPOXIDE : < 1%)

03 - HAZARDS IDENTIFICATION

MOST IMPORTANT HAZARDS	-
HEALTH EFFECTS	Repeated exposure may cause skin dryness or cracking Risk of skin sensitisation
SPECIFIC HAZARDS / EC	Repeated exposure may cause skin dryness or cracking

04 - FIRST AID MEASURES

GENERAL ADVICE	Take off immediately all contaminated clothing
INHALATION	Move to fresh air Oxygen or artificial respiration if needed In case of persistent problems : Consult a doctor
SKIN CONTACT	Wash immediately, abundantly and thoroughly with soap and water
EYE CONTACT	Wash immediately, abundantly and thoroughly with water If irritation persists, consult an ophthalmologist
INGESTION	In case of problems, consult a doctor
PROTECTION OF FIRST-AIDERS	If entering a saturated atmosphere, wear a self contained breathing apparatus

05 - FIRE-FIGHTING MEASURES

SUITABLE EXTINGUISHING MEDIA	Dry powder Foam Carbon dioxide (CO2) Water
SPECIFIC HAZARDS	Combustible product (when hot) At high temperature : Thermal decomposition gives : Carbon oxides
SPECIFIC METHODS	Ensure a system for the rapid emptying of containers In case of fire, remove exposed containers Cool containers / tanks with water spray
SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS	In case of fire, wear a self-contained breathing apparatus

06 - ACCIDENTAL RELEASE MEASURES

PERSONAL PROTECTION	Avoid contact with skin and eyes and inhalation of hot vapours
ENVIRONMENTAL PROTECTION	Do not release into the environment Do not let the product enter into drains Contain by damming
METHODS FOR CLEANING UP	-
Recovery	Pump into an inert labelled emergency container Absorb the remainder with an inert absorbent material
Disposal	Destroy the product by incineration at an approved waste disposal site

07 - HANDLING AND STORAGE

HANDLING	-
Technical measures/Precautions	Storage and handling precautions applicable to products : (*) LIQUID PROBABLY SENSITIZER Ensure appropriate exhaust and ventilation at machinery Provide showers, eye-baths
Safe handling advice	Prohibit contact with skin and eyes and inhalation of vapours
STORAGE	-
Technical measures/Storage conditions	Keep container tightly closed Provide a catch-tank in a bunded area
Incompatible products	Oxidizing agents
PACKAGING MATERIALS	-
Recommended	Ordinary steel

08 - EXPOSURE CONTROLS / PERSONAL PROTECTION

PROTECTIVE PROVISIONS	Ensure sufficient air exchange and/or exhaust in work areas
PERSONAL PROTECTION EQUIPMENT	-
Respiratory protection	High concentrations or prolonged activity: Mask with specific cartridge (organic vapours) (product handled when hot)
Hand protection	Splash contact, intermittent and prolonged PVC gloves Surface thickness : [1.2-1.4] mm
Eye protection	Safety glasses
Skin and body protection	At the workplace: Or Intervention at incident: Combination with delayed penetration
Specific hygiene measures	Prohibit contact with skin and eyes and inhalation of vapours

09 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE (20°C)	Liquid
COLOUR	Light yellow
ODOUR	Aromatic
FLASH POINT	Open cup : 144 °C Standard : NF T 60 118
AUTOIGNITION TEMPERATURE	459°C (EEC directive 84/449/EEC : Test A15)
VAPOUR PRESSURE	(20 °C) : 3.4 x 10EXP(-3) hPa (mbar) (100 °C) : 1.3 hPa (mbar)
DENSITY	Liquid : (20 °C) : 1010 kg/m³ (50 °C) : 999 kg/m³ (80 °C) : 960 kg/m³
SOLUBILITY	-
WATER	(20°C) : not miscible
Solvents	Soluble in most organic solvents
PARTITION COEFFICIENT (n-octanol/water)	log Pow = 4.56
OTHER DATA	Surface tension : 38.24 mN/m (25°C) Flow temperature : < -50°C Viscosity (20 °C) : 6.5 mm2/s (cSt) Ignition temperature: 154°C (Standard NFT 60.118)

10 - STABILITY AND REACTIVITY

MATERIALS TO AVOID	Oxidizing agents
HAZARDOUS DECOMPOSITION PRODUCTS	At high temperature : Thermal decomposition gives : Carbon oxides
FURTHER INFORMATION	The product is stable at ambient temperature In absence of oxygen : Stable up to approximately 280°C

11 - TOXICOLOGICAL INFORMATION

ACUTE TOXICITY	-
Inhalation	According to its composition, this product should not be harmful in normal conditions of use In animals : Non lethal to rat in saturated atmosphere of vapours during 4 h. Inhalation of vapours due to thermal decomposition : (700 °C) Exposure duration 1 h : Non lethal Difficulty in breathing Formation of carboxyhaemoglobin Effect reversible within a few days
Ingestion	According to its composition, can be considered as : Practically not harmful if swallowed LD50/oral/rat = 3 - 10 g/kg
Skin-contact	According to its composition, can be considered as : Practically not harmful in contact with skin
LOCAL EFFECTS	-
Skin-contact	In animals : Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product
Eye-contact	In animals : (rabbit) Slightly or not irritating to eyes
SENSITIZATION	-
Skin-contact	Risk of skin sensitisation (PRESENCE OF : CYCLOALIPHATIC EPOXIDE)
CHRONIC TOXICITY	According to available experimental data : By mouth : No specific toxic effects to rats (500 mg/kg)
SPECIFIC EFFECTS	GENOTOXICITY : Inactive in : - Micronucleus test in vivo rat - Ames test in vitro

12 - ECOLOGICAL INFORMATION

PERSISTENCE/DEGRADABILITY	-
In water	Biological degradability : Primary biodegradation : 76 % after 48 d
BIOACCUMULATION	log Pow = 4.56
ECOTOXICITY	-
AQUATIC TOXICITY	-
Acute toxicity	Daphnia : no effect up to the limit of solubility Bacteria : EC 0 = 1000 mg/l
Long term toxicity	Fish : LC 50, 14 d (Brachydanio rerio) = 2.53 mg/l

13 - DISPOSAL CONSIDERATIONS

DISPOSAL OF PRODUCT	Destroy the product by incineration at an approved waste disposal site (in accordance with local and national regulations)

14 - TRANSPORT INFORMATION

Technical consignment name :	See Section : 2
ADR/RID	Not regulated
ADN/ADNR	Not regulated
IMDG	Not regulated
IATA	Not regulated

Consult ARKEMA's safety department for any further information

15 - REGULATORY INFORMATION

UK REGULATION SAFETY DATA SHEET SUPPLY	CHIP 3 : Chemical (Hazard Information and Packaging for Supply) Regulations 2002
EEC DIRECTIVE	-
SAFETY DATA SHEETS	D. 91/155/EEC amended by D.93/112/EEC and D. 2001/58/CE: Dangerous substances and preparations
EC CLASSIFICATION / LABELLING	-
DANGEROUS PREPARATIONS	D. 1999/45/EC amended by D. 2001/60/CE R66 _ Repeated exposure may cause skin dryness or cracking S36/37/39 _ Wear suitable protective clothing, gloves and eye/face protection
HAZARDOUS COMPONENTS	Contains : CYCLOALIPHATIC EPOXIDE
INVENTORIES	EINECS (EU) : conforms TSCA (USA) : conforms DSL (Canada) : conforms AICS (Australia) : conforms ENCS (Japan) : conforms IECSC (China) : conforms (*)

16 - OTHER INFORMATION

FURTHER INFORMATION	WHEN USED IN FORMULATIONS, CONTACT US FOR LABELLING

-

This information applies to the PRODUCT AS SUCH and conforming to specifications of ARKEMA
In case of formulations or mixtures, it is necessary to ascertain that a new danger will not appear
The information contained is based on our knowledge of the product, at the date of publishing and it is given quite sincerely. However the revision of some data is in progress
Users are advised of possible additional hazards when the product is used in applications for which it was not intended. This sheet shall only be used and reproduced for prevention and security purposes
The references to legislative, regulatory and codes of practice documents cannot be considered as exhaustive
It is the responsibility of the person receiving the product to refer to the totality of the official documents concerning the use, the possession and the handling of the product
It is also the responsibility of the handlers of the product to pass on to any subsequent persons who will come into contact with the product (usage, storage, cleaning of containers, other processes)
the totality of the information contained within this safety data sheet and necessary for safety at work, the protection of health and the protection of environment

The (*) indicate the changes made with respect to the previous version

End of document.

Annex C

Capacitor examination report, by Vishay

VISHAY Electronic Division ESTA

Untersuchungsbericht // Findingsreport

Bericht Nr.: Report No.:	A101301	Datum: Date:	25.10.2010

Kunde / Customer:	**Converteam, France - Queen Mary II**		
Teile Nummer Kunden - Customer part no.:	-	Datecode:	2002
Produktfamilie - Device Type:	Phao 8,242/696,7/1	Charge No.:	RA 29750,1
Referenz Nr. Kunde - Ref. no. customer:	C - 006665 - EXBK0761	Serial-No. :	764422, 764414
Materialnummer - Material no.:	5961-29750-01	SAP-Order no.	8J28002
RMA-Nummer - RMA Number:	A101301	WE-No. :	18675
Rücklieferstückzahl - Returned QTY.:		-	-

Datei / File: A101301C.docx

Goods receipt	QA receipt	In process	QA closed	Statement to customer
25.10.2010	25.10.2010	25.10.2010	09.11.10	09.11.10
Bearbeitungszeit / handling time: -				

1. Problembeschreibung / Subject of complaint

An Explosion happened on the Queen Mary II. Photos and a circuit diagram were submitted. Capacitor #764422 exploded. The bottom was blown out and the housing pushed upwards (fig. 1). On the capacitors in the neighborhood the bushings were ripped off. The power was shut down within 2 seconds or less after the explosion.

2. Team: [redacted]

Sprecher: [redacted]

3. Untersuchungsergebnis / Problemursache: Analysereport / Problem caused by:

Analyse / Analysis:

The analysis was done on 04.11.2010 in the Vishay factory in Blatna/Czech Republic.

Attendees:

[redacted]

Technology of the capacitors:

The capacitor consists of 36 elements. 9 elements are connected in parallel to one group, 4 groups are connected in series. An element consists of 2 aluminum foils with Polypropylene in between as dielectric. One element has a capacity of ca. 12 µF, one group has 108.8 µF and the whole capacitor 27.2 µF. If one element fails, it creates a shortage for the whole group. So the total capacity of the capacitor will increase and the voltage on the remaining groups will increase too. After the first failure the voltage increases by 33%. Under this condition the capacitor may continue to work for some weeks. After the next failure the voltage on the remaining groups will increase by 100%. So the remaining groups will fail within a few seconds, resulting in a capacitor with a shortage. By monitoring the unbalance current of the capacitors connected in double-star, the failing of an element can be detected and the power can be switched off.

#764422
The shape of the housing is severely deformed (fig. 2). The elements were blown out of the housing by the explosion (fig. 3), they are damaged and disordered (fig. 4). The element stack is fixed in the housing by a metal plate which is spot-welded to the walls of the housing. This plate is ripped off from one wall and bent downward (fig. 5). At the inside of the cover there are no traces of an electric arc to be seen (fig. 5).
The bottom of the housing is bent to an U-shape (fig. 6). On the inside of the bottom there are also no traces of an electric arc.

Kunde / Customer:	**Converteam, France - Queen Mary II**		
Teile Nummer Kunden - Customer part no.:	-	Datecode:	2002
Produktfamilie - Device Type:	Phao 8,242/696,7/1	Charge No.:	RA 29750,1
Referenz Nr. Kunde - Ref. no. customer:	C - 006665 - EXBK0761	Serial-No. :	764422, 764414
Materialnummer - Material no.:	5961-29750-01	SAP-Order no.	8J28002
RMA-Nummer - RMA Number:	A101301	WE-No. :	18675
Rücklieferstückzahl - Returned QTY.:		-	-

Datei / File: A101301C.docx

#764414

The housing of this capacitor was severely bulged, one bushing was missing. fig. 7 is a view down to the capacitor after the cover was cut off. The copper band that gives the contact between the (missing) bushing and the element stack is broken; there are traces of electric arcs (fig. 8). The element stack is severely burned (fig. 9, fig. 10). The elements are partly deformed by heat (fig. 10). On the front sides the solder contacts are partly burned or molten (fig. 11, broad marking). The inner parts of the isolation between elements and housing are damaged (fig. 11, narrow marking), but the outer layers still are sound. There was no flashover between element stack and housing. In each group there is at least one shorted element.

Mögliche Ursachen / Probable reasons:

Due to the far accelerated damages on #764422 it is not possible to state the cause for the defect.

The damages on #764414 definitely cannot have happened within the short time of ≤ 2 seconds between the explosion and the shutdown of the energy. So this defect is not a consequence failure of the explosion. The defects in the capacitor must have occurred over a longer time frame.

Theoretically both damages could have been happened simultaneously, triggered by an external event like excessive harmonic current. The energy shutdown after the explosion of the first capacitor prevented the explosion of the second one.

Another theory could be a defect on parts of the safety circuit, the failing of an element in a capacitor cannot be recognized. Due to the increased voltage on the sound groups flashover will happen in these groups after some time of operation. So this capacitor will end with a shortage.

The current through this capacitor is limited by the other capacitors in the double-star circuit to ca. 440 A. This current will heat up the internal conductors and the defective elements. The damages observed in #764414 widely may be explained by this current. At a temperature > 85 °C the Polypropylene starts to swell. The height of the element stack will increase and will break the fixing plate on the top of the stack.

As a consequence of the growing stack, the contacts on elements will be ripped off partly. The weakened contacts will heat up in addition and so start a self accelerating process. Finally the contact on the elements may be completely burned. This can be seen in fig. 11. Over the broken contact an electric arc started to burn, that damaged the isolation and vaporized the oil. The vaporized oil caused the bulging of the housings. Probably by chance the arc on #764414 went out before the housing exploded. The capacitor remained in the bank bulged, but without explosion. On #764422 the arc continued to burn until the housing burst.

In this scenario the massive impulse of the housing directed to the ceiling is just a very rare consequence of the extreme pressure in the housing.

Theoretically also a flashover from the ‘hot’ cable under cover to the housing (ground) would dissipate a high amount of energy within very short time. This would explain the impulse of the housing. Such a flashover would leave a spot of burned metal on the housing. In the housing there are no marks of an electric arc. In addition, this scenario would not explain the damages on the second, bulged device.

Kunde / Customer:	Converteam, France - Queen Mary II		
Teile Nummer Kunden - Customer part no.:	-	Datecode:	2002
Produktfamilie - Device Type:	Phao 8,242/696,7/1	Charge No.:	RA 29750,1
Referenz Nr. Kunde - Ref. no. customer:	C - 006665 - EXBK0761	Serial-No. :	764422, 764414
Materialnummer - Material no.:	5961-29750-01	SAP-Order no.	8J28002
RMA-Nummer - RMA Number:	A101301	WE-No. :	18675
Rücklieferstückzahl - Returned QTY.:		-	-

Datei / File: A101301C.docx

4. Reparaturkosten / Cost of repair

The capacitors are no more repairable

5. Bemerkung / Remark

It may be difficult to identify the real root cause and to fix a suitable countermeasure. In any case an additional security level could be established. E. g. the usage of an overpressure switch: The switch is activated when the pressure in the housing exceeds a certain limit and must shut down the energy automatically within a few seconds.

In general there are two factors that affect the lifetime severely:
1. frequent transient voltages
2. increased temperatures

Transient voltages are caused by switching events. According IEC 60871-1 cl. 19.2 it is assumed that capacitors are switched up to 1000 times per year (only 2-3 times per day). If the switching occurs more often, the capacitors may be designed for higher voltage respectively lower operation field strength.

Increased temperature of the capacitors is not only influenced by the temperature of ambient air, but also by infrared radiation sources in the neighborhood and by eddy currents induced in the housings by magnetic fields from inductances.

The heating by infrared radiation can be reduced by the usage of infrared shields between capacitors and the radiation source. The heating by eddy currents can be avoided by the usage of antimagnetic stainless steel for housing.

Finally there may be the chance of using element fuses in the capacitor. If an element fails, it is disconnected and the capacitor may continue to operate for a longer period. Whether these fuses are possible depends of the final design.

Revised By / Date [redacted] **25.10.2010**	**Checked By / Date** [redacted] **09.11.2010**	**Claim confirmed** yes ( ) **Reklamation anerkannt** no (X)
Approved: By / Date: [redacted] **09.11.2010**		

VISHAY Electronic Division ESTA

Untersuchungsbericht // Findingsreport

Bericht Nr.: Report No.:	A101301	Datum: Date:	25.10.2010

Kunde / Customer:	**Converteam, France - Queen Mary II**		
Teile Nummer Kunden - Customer part no.:	-	Datecode:	2002
Produktfamilie - Device Type:	Phao 8,242/696,7/1	Charge No.:	RA 29750,1
Referenz Nr. Kunde - Ref. no. customer:	C - 006665 - EXBK0761	Serial-No. :	764422, 764414
Materialnummer - Material no.:	5961-29750-01	SAP-Order no.	8J28002
RMA-Nummer - RMA Number:	A101301	WE-No. :	18675
Rücklieferstückzahl - Returned QTY.:		-	-

Datei / File: A101301C.docx

fig. 1 (photo by customer)

fig. 2

fig. 3 (photo by customer)

VISHAY Electronic Division ESTA

Untersuchungsbericht // Findingsreport

Bericht Nr.: Report No.:	A101301	Datum: Date:	25.10.2010

Kunde / Customer:	**Converteam, France - Queen Mary II**		
Teile Nummer Kunden - Customer part no.:	-	Datecode:	2002
Produktfamilie - Device Type:	Phao 8,242/696,7/1	Charge No.:	RA 29750,1
Referenz Nr. Kunde - Ref. no. customer:	C - 006665 - EXBK0761	Serial-No. :	764422, 764414
Materialnummer - Material no.:	5961-29750-01	SAP-Order no.	8J28002
RMA-Nummer - RMA Number:	A101301	WE-No. :	18675
Rücklieferstückzahl - Returned QTY.:		-	-

Datei / File: A101301C.docx

fig. 4

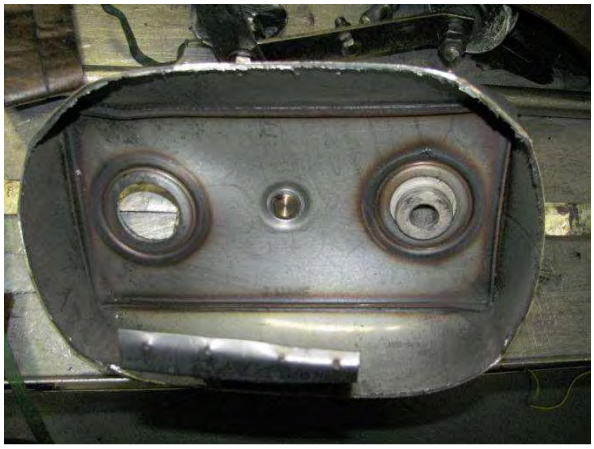

fig. 5

fig. 6

fig. 7

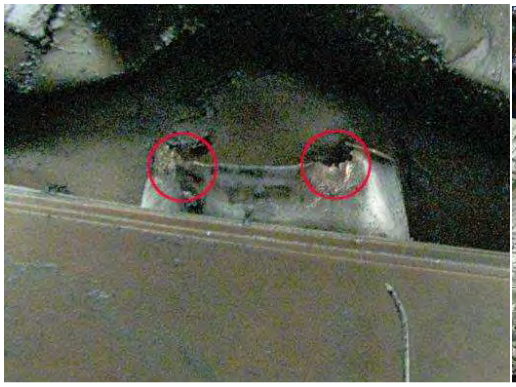

fig. 8

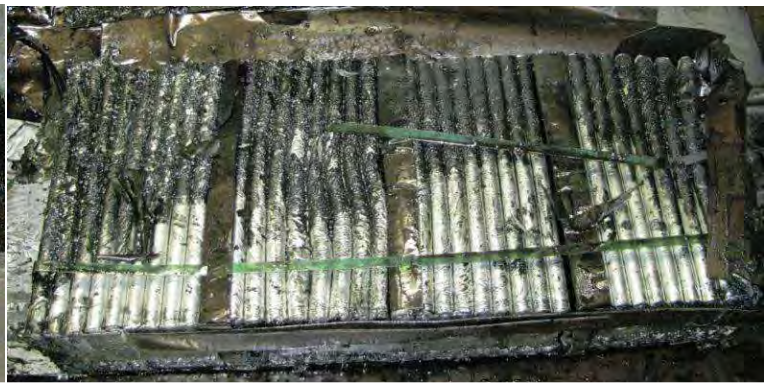

fig. 9

Kunde / Customer:	**Converteam, France - Queen Mary II**		
Teile Nummer Kunden - Customer part no.:	-	Datecode:	2002
Produktfamilie - Device Type:	Phao 8,242/696,7/1	Charge No.:	RA 29750,1
Referenz Nr. Kunde - Ref. no. customer:	C - 006665 - EXBK0761	Serial-No. :	764422, 764414
Materialnummer - Material no.:	5961-29750-01	SAP-Order no.	8J28002
RMA-Nummer - RMA Number:	A101301	WE-No. :	18675
Rücklieferstückzahl - Returned QTY.:		-	-

Datei / File: A101301C.docx

fig. 10

fig. 11

Annex D

DNV circular letter, dated 20 December 2007, regarding polypropylene film vapour

DET NORSKE VERITAS AS
Maritime Technology and
Production Centre

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Fax: +47 67 57 99 11
http://www.dnv.com
Org. No: NO 945 748 931 MVA

To manufacturers of frequency converters.

Your ref.:	Our ref.:	Date:
	MTPNO370/MLAU/P261 1E-J-427	2007-12-20

Circular letter to manufacturers of frequency converters for propulsion and thrusters

Incident in frequency converter – information about possible hazard

The intention of this letter is to inform manufacturers of frequency converters for propulsion and thrusters about a possible hazard connected to usage of film capacitors (e.g. polypropylene film) in frequency converters.

Recent knowledge has shown that there is a risk that the film material may release flammable gases to the environment because of overheating or melting. In enclosed cubicles these gases may lead to a hazardous environment that can ignite and cause explosion. Resent experience shows that this may cause danger to personnel and risk for damage to equipment located in the vicinity.

Manufacturers of frequency converters are requested to review and evaluate their design and identify the possibility for incidents. A detailed review of the operating conditions of capacitors versus data given by manufacturer is to be done. Calculated values of currents, voltages, frequencies, temperatures etc should be verified by test results. It is of vital importance that the capacitor is operated within specified limits under all sailing conditions e.g. full load in tropical areas. Possibility for improvement and safety measures should be evaluated. Conclusions are to be submitted to DNV within May 1st 2008.

DNV will evaluate if special requirements are to be implemented for this type of equipment. Further notice will be given when possible requirements have been decided.

If you have any further questions, please contact [redacted] or [redacted].

Yours faithfully
for DET NORSKE VERITAS AS

[redacted]

Head of Department
Systems & Components

[redacted]

Head of Section

Annex E

Current transformer failure analysis report, by Vishay

RMA- Nr.	**B012001**	**WE-Nr.** 18751					
customer :	**Converteam, France - Queen Mary II**						
#	**Type**	**pcs.**	**No.**	**date**			
1	ESTAsymW WW-210	1	038799	2002			

1. Findings

The device was opened und the attention of

- [redacted]
- [redacted]
- [redacted]

Primary and secondary circuit are electrically open. fig. 1 shows the housing after removal of the cover. The primary coil is completely destroyed. The strand is frazzled, its insulation is missing. In fig. 2 the transformer was removed from the housing. fig. 3 shows the transformer after removal of the primary coil and the insulation between primary and secondary circuit. The insulation of the secondary circuit wire is partly crushed. In fig. 4 the wire was removed until the location of the breakage was located. At the marking the wire is broken and only a part of the insulation is still existing.

2. Potential failure cause

The damages are the consequence of an excessive current through the primary circuit, mainly caused by the electro-dynamical forces induced in the primary coil. Most probably this current was caused by the short circuit of a defective capacitor. It is not clear why the energy was not shut down before the capacitor failed completely with a short, because a functioning transformer and relay should have created a trip when the first element in a capacitor failed.

fig. 1

fig. 2

fig. 3

fig. 4

Annex F

Mounting and maintenance instructions, by Vishay

Mounting and Maintenance Instructions
Static Power Capacitors, Naturally Air-Cooled

1. General:
These instructions comprise fundamental advice concerning the application of power capacitors and draw attention to dangers that possibly may occur during their operation. The installation shall only be made by adequately trained personnel and in compliance with the safety regulations and rules relevant at the site of application. The VDE and IEC standards quoted when placing the order are applicable for the production, testing, and operation of the capacitors unless other prerequisites were demanded by the customer. For detailed data with regard to protective engineering concerning H.V. capacitors, refer to IEC 871-3.

2. Safety measures:
High voltage a cause of danger:
The capacitors shall be mounted in such a way as to exclude any danger for people, by providing earth connection according to the rules, by placing warning plates in the appropriate positions, and by taking precautions to protect against accidental contact. Before works are carried out on a capacitor or a capacitor bank, the equipment must be inactive and the following safety rules shall be observed:

1. **Switch off entire system**
2. **Secure against reenergizing**
3. **Discharge**
4. **Connect to earth**
5. **Short-circuit capacitor terminals**

Explosion or Fire hazard:
Even if monitoring and safety devices exist, the incidence of overloading or an important electrical defect may cause the destruction of the casing and/or the bushings. Another consequence of this may be that the capacitor's combustible component parts catch fire. This aspect shall be taken into account at the site of erection of the capacitor.

Treatment of defective capacitors:
Specific precautions are required in case of fault clearance at defective equipment: When the capacitors have been subject to overloading, an important pressure may come into existence in the capacitor casing; therefore, the capacitor unit should be allowed to cool down before works are started at it. Also to be taken into account is the possibility of the internal discharge resistors having been interrupted and thus having become ineffective, and that both the case insulation and the internal interconnection have been damaged. If impregnating agent is leaking, the safety rules referring to the type of impregnation indicated on the rating plate (refer "Oil No. ....") are to be observed. Relevant advice is given in the correlated safety data sheet.

3. Transport:
The capacitors are shipped ex works in appropriate packing. Upon receipt, each consignment shall be checked for its proper condition. Lifting and transport devices shall be applied to the lifting lugs, to the lateral transport angles, or to the bottom fixings of the capacitor only. Under no circumstances, the porcelain bushings (terminals) may be utilized for transportation or lifting. Damages due to transport do not fall under the manufacturer's liability. Any damage having occured during transport shall be notified to the forwarder at once for claiming indemnification. The forwarder will have to make the official statement on the facts, which serves as evidence for the transport insurance company.

4. Installation and Putting into operation:
The rated values and the internal connection shown on the rating plate shall be checked for their suitability for the particular case of application. Partial ratings are marked on the cover beside the bushings or, numbered on the cover and shown on a second rating plate. The average value of the capacitors' operating voltage shall not be higher than the capacitors' rated voltage. For short-term admissible overloading, refer to the above-quoted standard. All short-circuit connections (for discharging) shall be removed before putting the capacitor equipment into operation.
All current-carrying connections shall be flexible and have an adequate cross-section. Connecting lines must not bring to bear any substantial tension, pressure, or bending stress on the capacitors' bushings.

Max. terminal tightening torque:	M6 = 3 Nm	M10 = 10 Nm	M16 = 30 Nm
in accordance with DIN 46 200	M8 = 6 Nm	M12 = 15.5 Nm	

The connections shall be mechanically sound and safe against coming loose, and shall be retightened after four weeks of operation. Stressing the welds by trailing the casing on the floor or on the carrier framework may cause leakages. Scratches on the varnish are to be repaired immediately in order to avoid underfilm corrosion.
In places where the capacitors are subject to heavy mechanical vibrations, each capacitor unit or the entire capacitor bank shall be placed on rubber supports of sufficient elasticity.

Horizontal mounting is only permissible if so explicitly indicated in the leaflet describing the capacitor, or after the manufacturer's written consent. Damages resulting from incorrect mounting are excluded from the manufacturer's liability.
For switching the capacitors, only switchgear without restriking may be used. Restriking causes high transient overvoltages and may lead to a sudden failure of the capacitors.

5. Cooling
Static capacitors generate heat during operation. When observing both the maximum admissible cooling air temperature and the minimum spacing between the units (recommended are >35 mm between the casings' broadsides), the natural convection will guarantee sufficient cooling.
The upper limit of the temperature category is indicated on the rating plate. This value must be observed under all circumstances, and in framed constructions it must not be exceeded at any spot within the framework.
Cooling conditions in accordance with the indicated standard shall be observed. The manufacturer's liability does not apply to capacitors failing because the permissible ambient temperature has been exceeded.

6. Earthing and Discharging:
The earthing of the casing or the insulating support shall be effected at the spot marked ⏚
Capacitor units and/or capacitor equipment in live casings shall be protected against physical contact and shall be provided with warning plates. Rules effective at the site of installation shall be observed. After disconnection from the source of supply, the capacitors shall be discharged in order to avoid endangering the maintenance personnel and parts of the equipment. Every capacitor equipment shall, therefore, be firmly connected to a discharge device unless it is directly connected to another electrical device which serves as a discharging circuit.

The rating plate of capacitors with incorporated discharge resistors show the symbol —▭— or the letters "EW" *[Entladewiderstand = discharge resistor]*. The discharge duration is rated in accordance with the instruction indicated on the capacitor's rating plate. Reconnection of the capacitor equipment to the supply is only permissible after the residual voltage has been reduced to less than 10% of the rated voltage.

7. Operation and Maintenance:
Every three months, the operator of the equipment shall check the cooling air conditions, change the ventilation filters if necessary, carry out external inspection of the capacitor units with regard to leakages and overheating at the terminals. In case of heavily polluted environment, the bushings shall be cleaned at regular intervals. Switchgear shall be maintained in accordance with the manufacturer's Mounting and Maintenance Instructions.
Leaky capacitors shall be returned to the factory or to our customer service stations for inspection and repair.
In case impregnating agent has leaked out, the safety rules applicable for the type of impregnation indicated on the rating plate shall be observed.

8. Monitoring devices:
The choice of monitoring and protection devices depends on the characteristics of both the network and the capacitor bank, and has to be made for each individual case of application.

9. Clearance of trouble:
When monitoring devices have tripped, it should be checked whether the tripping is due to electrical or thermal overloading. If the damage occurred in the capacitor zone, then an external inspection of the switchgear, of the terminals, and of the capacitor casings shall be carried out observing all safety rules. Where there is no external sign of fault, it is necessary to check the capacitance of the individual units by means of a capacitance meter. We suggest to replace H.V. capacitors which exhibit a capacitance deviation of more than 5% from the capacitance value at time of delivery. It is also recommended to carry out a dielectric test phase versus earth. The test voltage level depends on the level of the capacitor's rated insulating voltage. An unserviceable capacitor shall be disconnected and removed from the bank. Even short-term overloading may cause permanent damage to a capacitor, therefore, it may be wise to have the equipment checked in the factory.

Capacitors for return should be addressed to:

VISHAY ELECTRONIC GMBH
Roederstein/ESTA Division
Hofmark-Aich-Straße 36
D-84030 Landshut

The packing should be so marked that the capacitor is transported in a standing position with the terminals upwards. Leaking capacitors shall be made tight or packed in appropriate material. The customer will receive a detailed report of findings after completion of the tests carried out on all returned units.
Replacement units should be requisitioned giving both the data on the rating plate and the capacitor number. Capacitors which have been opened by the purchaser during the guarantee period are exempted from the guarantee.

10. Disposal:
Since all static power capacitors are impregnated with a liquid agent, they have to be disposed of under proper supervision at the end of their service lives. Local guidelines concerning pollution control have to be observed.

11. Note:
Correctly mounted and maintained capacitors of our make have a service life above average. However, if instructions are not observed, damages may occur which, in most cases, are beyond repair.

Annex G

Arc-flash analysis, by UK Ministry of Defence

QM2 Aft HV Harmonic Major Failure

Observations on Photographic Evidence

1. The centre phase L2 shows evidence of the most vaporisation of busbar (C) material. Phase L1 has a similar erosion pattern, (G). However, phase L3 shows the least erosion in the top left hand corner (A).
2. Points B and D show evidence of arcing in the bottom left hand corner of phases L2 and L3; however, there is no photograph of Phase L1 to check if the arc also appeared at this point of the L1 busbar.
3. It is noted that the blackening in the cubicle is more pronounced in the left hand side, near phase L3 than the right hand side near phase L1. Bushing E shows considerable blackening indicating
4. Point F is interesting as it shows possible burning patterns from underneath the capacitor. Could this be evidence of burning dielectric fluid that has been released from a failed capacitor? The dielectric fluid could have been ignited by the arc flash plasma.
5. Point J shows partial melting of plastic cover over fire extinguisher some several feet from the HV Harmonic filter enclosure.
6. Point I shows evidence of overpressure and considerable blackening from soot.

Assumptions

1. I am assuming that there is no evidence of the arc touching the casework of the HV Harmonic Filter?
2. As this is a high resistance earthed power system then the high resistance in the generator neutral point would have limited arc currents to earth to below 10Amps

Discussion Points

From the photographic evidence it suggests that the arc may have started on phases L1 or L2, as a phase to phase arc. I suspect that the arc may have started at the bottom corner (points B and D) of the busbar and migrated to the points A and C. At this point the arc became three phase with contact made at point G. Arcs have a very low inertia and move very quickly in busbars (~200m/s)[1]. They are driven by electromagnetic forces and always move away from the source of the electrical power. As the arc was already at the edge of the busbar, it could not traverse to towards the cable lugs and progress up the cable due to the electromagnetic forces, therefore being at the edge of a busbar it stopped and this is where the most vaporisation occurred. The volume of erosion appears to be quite high which indicates both a high arc current and a prolonged period of existence. This would be consistent with a major release of energy (failure of enclosure doors), coupled with a large volume of smoke release (under arcing conditions copper sublimates ~64,000 times[2]).

[1] Cahiers Techniques 38, Fault Arcs on Busbar Sets and Switchboards, Bouvier and Ducluzaux, Merlin Gerin.
[2] High Current Arc Erosion of Electric Contact Materials, W.R. Wilson, IEEE transactions, August 1955

Three-phase arcs have very erratic behaviour and the arc current is different in each phase due to differing magnetic flux linkages between phases. This causes different erosion rates in each phases, it is typical that the middle phase has the highest arc fault current.[3]

The partial melting of the fire extinguisher some several feet from the enclosure is either evidence of a very hot vapour cloud which exited from the enclosure or it could be evidence of radiation heating (IR or UV) from arc flash plasma which exited from enclosure at point I.

If the arc started at the cable entry side of the HV harmonic enclosure then the arc would want to move away from the source of electrical power generation. This would support a theory that in this case the arc moved rapidly along the top of the capacitor busbars, unimpeded by insulators or connecting bolts and the plasma exited from the opposite side where most of the blackening appears to be. The horizontal nature of the busbars inside the HV Harmonic Filter enclosure could have directed the arc flash plasma towards the non-cable end of the enclosure and test results from work done by reference 3 shows that horizontal orientation of electrodes coupled with the enclosed nature of the installation could result in "worst case" conditions in terms of convective effects and make the incident energy very high.

There is little indication of what initiated the arc flash event, although it could be postulated that the following occurred:-

1. One or more capacitors were failing, but the current imbalance associated with partially failed capacitors went undetected because of the open circuit in the current transformer of the current unbalance detection system.
2. The failure mode of the capacitor resulted in weeping and discharge of dielectric fluid into the enclosure resulting in hydrocarbon vapour which collected onto insulated surfaces.
3. Partial discharges occurred across insulated surfaces which eventually led to a compromise of creepage distances and an arc flash initiated.
4. The arc moved rapidly from cable entry end of the 4th capacitor rank towards the opposite end of enclosure. A pressure wave blew the doors apart on both sides of the enclosure, but most of the arc vapour cloud moved with the arc out of the non-cable end of the enclosure.
5. Arc plasma exited the non-cable end of the enclosure and this radiated enough heat to start melting the plastic cover of the fire extinguisher on the bulkhead next to the compartment door. The melting to the plastic cover was heaviest at the brass/steel hose connector at the top of the extinguisher due to the absorption and re-radiation of heat from the brass/steel hose connector.
6. More evidence that supports a horizontal arc is the heat damage and smoke release which indicates a long period of arc existence. It is known that the feeder circuit breaker did not clear the fault and all the generators eventually tripped off the board together resulting in a black ship. This suggests that the arc voltage could have been high, resulting in a low arc fault current which was within the overcurrent trip level/time of the protection relays for the HV

[3] Effect of Electrode Orientation in Arc Flash Testing, Wilkins, Allison and Lang, Oct2005, IEEE Industrial Applications Conference Oct 2005.

harmonic filter feeder. This would have meant a low current arc being in existence for a prolonged period of time. This is supported by the level of damage to the enclosure and the smoke build up in the compartment with associated soot deposits.

Potential Recommendations to Consider

1. Arc flash is largely an unknown hazard in marine platforms and design of electrical equipment does not always take into account the initiation of arc flash or resistance to arc flash. HV Switchboards are the only electrical equipment that is made "arc resistant" and all IEC based classification societies require type testing of HV switchboards to IEC62271-200 Annex A. However, in this incident the equipment that was subjected to an arc flash was not a HV switchboard, but was a HV piece of equipment subjected to the same arc flash forces as a switchboard. It could be argued that HV Harmonic Filters are not frequently manned whereas HV switchboards could be manned when manually switching circuit breakers, therefore the time at risk for crew is higher for HV switchboards and hence the risk of an incident more likely and hence justifies the additional control measures. However, I believe that this incident demonstrates that it is no longer tenable to restrict arc resistant measures to HV switchboards alone. This is due to the large volume of smoke released, explosive nature of the event causing compartment overpressure and the risk of partial or total loss of electrical supplies on board with high risk of being unable to recover. Therefore, I recommend that standards are developed and incorporated into classification society rules which forces all HV electrical equipment (i.e. HV Harmonic filters, Transformers, Propulsion Converters, etc.) to incorporate measures that prevent and contain arc flash.
2. Arc flash studies should be conducted in accordance with IEEE guidance[4] on all marine electrical systems to ensure that protection devices will detect arc currents and clear such faults quickly. This is potentially a complex task as marine systems have variable short circuit levels according to the permutations of available generators that can be on-line in circumstance. However, Lloyds are proposing new rule changes which will require new builds to undertake such studies.
3. This incident could be extrapolated to LV systems, which often have much higher fault levels and the standard of design is lower than HV equipment. In addition crews often do not treat 440Vac electrical supplies with due care and attention. Maintenance operations such as thermal camera surveys are often undertaken with covers removed and equipment operating at high power. Current IEC standards and Classification Society Rules does not impose any requirements for LV equipment to have arc flash resistant switchboards or distribution boards. There is a new IEC technical guide[5] which provides guidance on arc testing of LV equipment. At present this is not a mandatory standard, but indicates an industry acceptance that arc resistance equipment should be extended to LV equipment. Therefore, the marine industry should consider the risk of LV arc flash and contemplate the development and

[4] IEEE 1584-2002, Guide for Performing Arc-Flash Hazard Calculations, Institute of Electrical and Electronics Engineers. December 2008
[5] IEC/TR 61641 Enclosed low-voltage switchgear and controlgear assemblies – Guide for testing under conditions of arcing due to internal fault

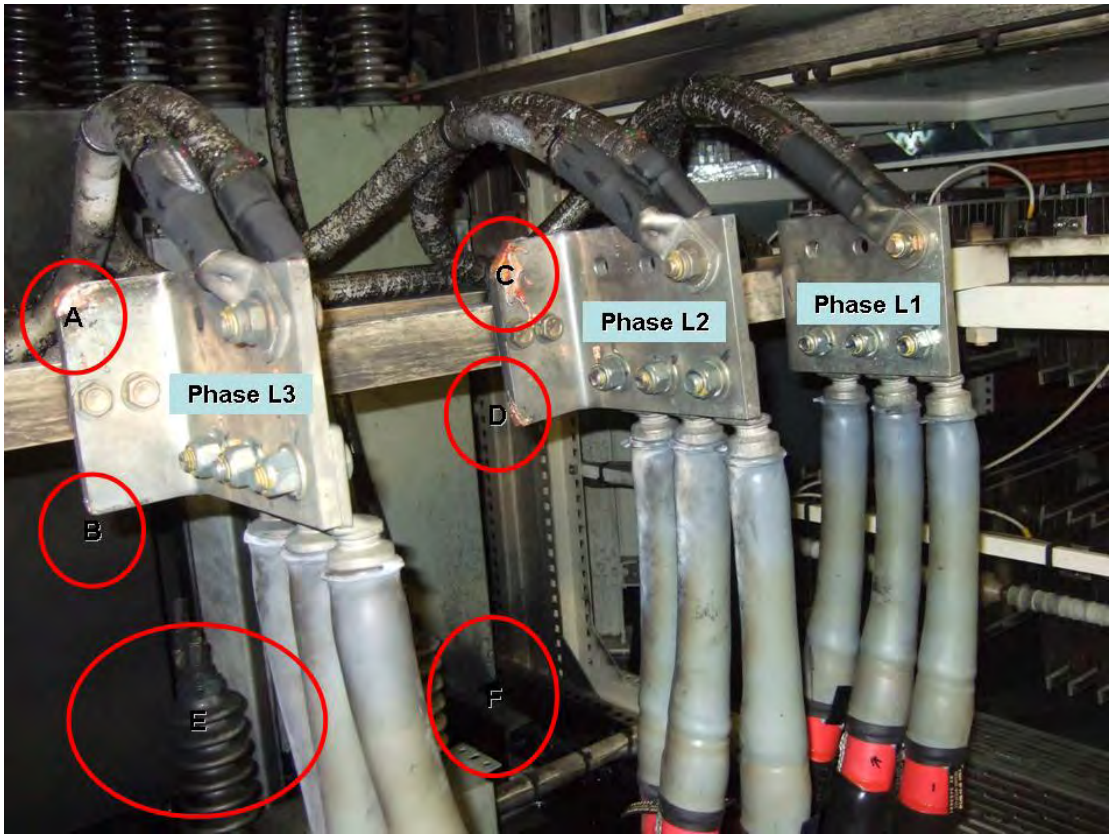
adoption of suitable standards that can be regulated through classification societies.

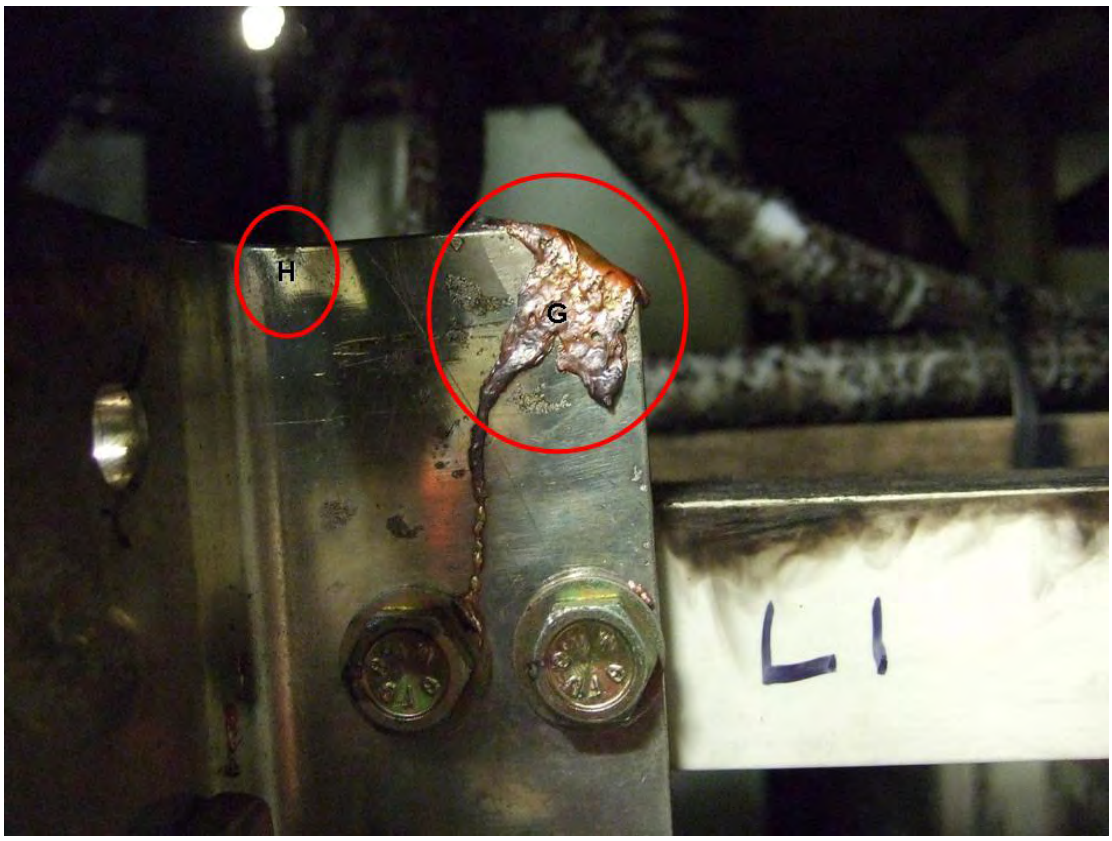
4. Awareness of the Arc flash hazard needs to promoted throughout the marine industry, so that designers, builders, owners, operators and engineers understand the hazard, risks and the potential risk reduction measures available to reduce the hazard to as low as reasonably practicable. It should be noted that the MCA Code of Safe Working Practices For Merchant Seamen (Feb 2004), makes no mention of the hazard of arc flash and only concentrates on electric shock. Indeed it could be construed that Section 22.11 (Maintenance) Electrical Equipment which advocates a second person to be in continually attendance to treat electric shock when working on or near live equipment could be dangerous if the second person is inside the boundary where arc energies could harm the second person. Without conducting formal arc flash studies the second person without appropriate PPE and awareness could become a serious causality in any electrical incident. The MCA CoP should be reviewed and updated to reflect the nature of arc flash hazards when working on or near live equipment.
5. Using arc flash studies as extolled in recommendation 2 appropriate warning labels can be fixed to electrical equipment and provide operators and maintainers with reliable advice on the risks when working on or near the equipment. This would allow appropriate PPE to be selected and ensure only essential work is ever contemplated to be conducted on live equipment.

[redacted]

CSP&MS Naval Authority
Fleet Wide Equipment
[redacted]

Pictures





Soot staining on the blown-out doors of the harmonic filter casing

Annex H

Electrical hazards of ‘*Hi-fog*’, by Omega Point Laboratories Ltd, for Marioff Corporation Oy

Electrical Hazards Represented by Marioff Hi-Fog Water Mist Systems Applied to Protect Electrical Spaces (Omega Point Laboratories, Inc. Tests)

Project Nos. 16927-118095 and 16927-119078

Prepared for

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Prepared by

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16015 Shady Falls Road
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(210) 635-8117

with Executive Summary by

Hughes Associates, Inc.
3610 Commerce Drive
Suite 817
Baltimore, Maryland 21227
(410) 737-8677

August 19, 2004

Electrical Hazards Represented by Marioff Hi-Fog Water Mist Systems Applied to Protect Electrical Spaces (Omega Point Laboratories, Inc. Tests) - Executive Summary -

The application of a fire protection system employing a conductive agent to an enclosure containing electrical equipment has been limited due to the perceived safety concerns for personnel present during system activation or re-initiating operation after activation of the system. Water, while non-conductive in its pure form, as generally available contains enough dissolved minerals to render it slightly conductive.

The hazard to personnel is manifested in the reduction in dielectric strength of the air gap or other insulating media between conductors to allow for electrical current flow at levels sufficient to be hazardous. An electrical leakage current, as these unintended currents are termed, above approximately 10 mA is considered hazardous as it can interfere with muscular control causing the victim to be unable to let go of the source of the current (Table 1) [1,2].

A Marioff Hi-Fog Water Mist System was utilized during this study. This system consisted of an electric high-pressure plunger pump, Marioff SPU-1, supplying water to the test nozzle at a pressure of 90 bar. Five Marioff Hi-Fog nozzles were utilized during this study ranging in flow-rate from 4.2 LPM, Marioff Hi-Fog 3B1MA4MA1000, to 36 LPM, Marioff Hi-Fog C10-57C.

Two types of tests were conducted during this study. The first type consisted of an energized 1 m x 1 m x 0.006 m aluminum plate onto which the water mist was discharged through a grounded nozzle. The separation distance and the type and level of the charge on the plate were varied during these tests. For most of the tests conducted, the leakage current was below 1 mA. The largest leakage current was 6.58 mA measured with a separation distance of 0.3 m (1 ft), 32.6 LPM of water (nozzle: 4S1MC8MC1000) and a charge of 13.2 kVAC applied to the plate. A significant portion of this measured leakage current, ~4.7-4.8 mA, existed prior to the activation of the water mist system.

The second type of test conducted consisted of discharging the water mist in-between two plates. The first plate was the same as in the previously described tests but was connected to ground. The second plate was 0.15 m x 0.15 m x 0.006 m and was connected to the voltage source. The gap into which the mist was discharged was 0.125 m wide. The water mist was discharged from a nozzle 1 m from the edge of the larger plate. The type and charge level were varied with the leakage current between the plates monitored. For all but one test conducted, the leakage current was less than 1 mA. The one test exception had a maximum leakage current of 2.32 mA, 36 LPM of water (nozzle: C10-57C) and had a charge of 15 kVAC applied to the second plate. It should be noted that the separation distance between these plates is less than the minimum separation distance for system voltages up to 13.8 kVAC of 0.178 m and for system voltages

between 13.8 kVAC and 23 kVAC of 0.254 m specified in the National Electrical Code NFPA 70 [3].

None of the tests conducted indicated any significant increase in hazard to the personnel in the vicinity of the charged plate due to the presence of the water mist. This conclusion is similar to the conclusions from testing conducted for the U.S. Navy by the Applied Physic Laboratory of Johns Hopkins University concerning potential shock hazards due to exposure of electrical equipment to water mist [4], and the tests conducted by the Laboratorio Central Oficial de Electrotecnia which were similar to tests by Omega Point Laboratories but involved higher voltages (45 kVAC and 95 kVAC) [5].

Table 1 Electrical Safety [2]

Readings		Effects
Safe Current Values	1 mA or less	Causes no sensation - not felt.
	1 mA to 8 mA	Sensation of shock, not painful; Individual can let go at will since muscular control is not lost.
Unsafe current values	8 mA to 15 mA	Painful shock; individual can let go at will since muscular control is not lost.
	15 mA to 20 mA	Painful shock; control of adjacent muscles lost; victim can not let go.
	50 mA to 100 mA	Ventricular fibrillation - a heart condition that can result in death - is possible.
	100 mA to 200 mA	Ventricular fibrillation occurs.
	200 mA and over	Servere burns, severe muscular contractions - so severe that chest muscles clamp the heart and stop it for the duration of the shock. (This prevents ventricular fibrillation).

Reference:

1. Fustich, C., "Transformer Room Fire Tests," General Services Administration Technical Report under project number PB 79-08, Washington, DC, 1980.

2. "Electrical Safety," Electricians Toolbox Etc., www.elec-toolbox.com, July 3, 2004.

3. NFPA, "National Electrical Code", NFPA 70, 2002 Edition, National Fire Protection Association, Quincy, MA, 2002.

4. Gauthier Jr., L.R., Bennett, J.M., Land III, H.B., "The Effects of Water Mist Discharge on Energized LPD 17 Electrical Equipment in the Absence of Fire – Initial Studies," Test Report AATDL-99-024, The Johns Hopkins University Applied Physics Laboratory, Columbia, MD, USA, January 29, 1999.

5. Millen, S.S., and Vacino, F.G., "Tests Conducted at the Ministerio de Ciencia Y Tecnologia Laboratorio Central Oficial de Electrotecnia (L.O.C.E.)", L.O.C.E. Report Number 200203350185, Madrid, Spain, May 4, 2002

Arc-flash incident case histories, by IEEE

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Table C.1—Case histories of arc-flash incidents

Setting	Electric system	Equipment	Activity	Event	Apparel	Outcome
1. Commercial site—1998	600/347 V ac	XFMR 1500 kVA, 12.47 kV—600/347 V Grounding Secondary ground Fault relay protected Primary fuse protected	Electrician installing a 400 A fuse in a panel module. Switch had been opened to isolate the fuse mount	Arc flash occurred in the panel directly in front of the employee. 	Hard hat Safety glasses	Third degree burns to 28% of the employee's body. Significant loss of sight, hearing, and smell. Ground fault relay did not open. Primary fuse operated.
2. Industrial site, power distribution—1994	Unit substation	Unit feeder circuits	Electrician was circuit testing on deenergized feeder circuits.	An arc flash occurred when the feeder circuits were reenergized at main substation while electrician was connecting test lead to fuse holder.	HV gloves Safety glasses	No injury.
3. Laboratory—1997	480 V ac	480 V ac electric panel MCC	Connecting temporary lighting and heat circuits from an MCC to a 480 V electrical panel in another room. Electrician was removing the upper bus bar cover that shields the line side connections in the panel.	While moving the cover, it contacted the C-phase of the bus bar causing an arc flash.	Unknown	The electrician had burns to his face and hands.
4. Industrial site, outdoor substation—1998	13.8 kV ac	HV switch	Electrician was using a paint brush to clean inside the switchgear cabinet in close proximity to energized equipment.	Debris or other material fell and contacted the energized C-phase knife blade creating an arc flash.	T-shirt	Second and third degree burns to the right arm and left hand.

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Table C.1—Case histories of arc-flash incidents *(continued)*

Setting	Electric system	Equipment	Activity	Event	Apparel	Outcome
5. Industrial site—1998	480 V ac	MCC	Electrician removed the door operating mechanism from a spare circuit breaker and was reinstalling the spare breaker to the mounting plate.	While reinserting screws into the spare breaker mounting plate, a screw penetrated a line side conductor causing a 480 V, three-phase arc flash.	Unknown	Second degree burns.
6. Industrial site—1992	480 V ac	480 V bus bar	One electrician was holding a ground lead in place while the other was tightening the lug with a "taped" Allen wrench near a 480 V bus shielded with an insulation blanket.	The Allen wrench slipped and contacted the 480 V bus.	Unknown	Burns to the hands of both electricians.
7. Utility generation plant	2400 V ac, three-phase, ungrounded, delta-connected	Motor starting circuit breaker (1950's vintage) 2400 V ac feeder bus had no main overcurrent protection of its own of any kind. Interlock that prevented breaker from being "racked in" while closed was missing. Breaker was in the "closed" position. Breaker feeds a 700 HP motor.	Operator racked the breaker "in" with it in the closed position, and then started to rack it out.	The 700 HP motor was accelerating and the breaker being backed out caused a significant arc flash to occur. The arcing fault continued until an overcurrent relay operated a breaker on the primary side of the 13.8 kV–2.4 kV transformer	Hard hat Leather gloves Safety glasses	No injuries.

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Table C.1—Case histories of arc-flash incidents *(continued)*

Setting	Electric system	Equipment	Activity	Event	Apparel	Outcome
8. Utility, outdoor substation—2000	13.2 kV ac	13 k V vacuum circuit breaker 200 A fused dropouts between the breaker bus and the main bus Maximum fault currents: 8 kA phase-to-ground 6 kA phase-to-phase	Electrician was reaching with a combination wrench for a stinger conductor bolt of C-phase on the energized breaker from a step ladder.	The wrench bridged C and B phases causing a phase-to-phase arc flash. The fuse dropouts cleared the fault in 27 cycles.	Cotton T-shirt	The burning T-shirt caused second and third degree burns to 60% of the upper torso.
9. Industrial site—1997	480 V ac	480 V MCC main breaker Placed lock and tag to isolate the MCC main breaker Unisolated feed existed to breaker that was out-of-service when work began	The circuit tested deenergized the day before accident. On second workday, electrician assumed (no test) circuit was still deenergized.	Electrician started to connect line side leads to the MCC main breaker when an arc flash occurred.	Unknown	The electrician suffered arc-flash burns from this incident.
10. Utility generation plant—1997	480 V ac	MCC	Racking in breaker.	An electrical connector touched a brace bar as the breaker was racked in and the phase was grounded causing an arc flash.	Unknown	Burns to both wrists.
11. Utility generation plant—1995	480 V ac	480 V feeder board 480 V breaker (reconditioned)	Racking in a reconditioned replacement breaker, but was unable to close the door due to incompatible components (incorrect part).	Standing to the left of the compartment, the electrician closed the breaker with just his hand in front of the compartment. The breaker malfunctioned causing an arc flash.	Unknown	Serious burns to hand.

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Table C.1—Case histories of arc-flash incidents *(continued)*

Setting	Electric system	Equipment	Activity	Event	Apparel	Outcome
12. Utility generation plant—1994	Precipitator power substation	480 V ac breaker	Trouble shooting for a ground indicator light problem. Inserted volt ohmmeter lead into the 1200 V ac socket of the meter.	When placing the meter probes across A and B phase buses the meter shorted causing an arc flash, which migrated to the panel above the work area and caused a phase-to-phase arc in panel.	Unknown	Second and third degree burns to both hands.
13. Industrial site—1994	480 V ac	480 V ac, 200 A panel	Turning breakers on and off to locate equipment feeds in machine shop.	The beaker shorted causing an arc flash between phases.	Unknown	Burn to right hand.
14. Utility generation plant—1992	440 V ac	440 V ac, molded frame breaker Distribution board	Electrician was removing a 440 V ac breaker, which had been out of service since 1982.	When cutting the leads to the 440 V ac breaker, an arc flash occurred.	Unknown	Serious burns to both hands.
15. Utility generation plant—1991	Less than 600 V ac	Motor rotation indicator	Performing a phase sequence check on a new bus and was using a motor rotation indicator issued by the tool room and not the phase sequence indicator.	When the power was applied to the bus, the motor rotation indicator shorted causing an arc flash.	Unknown	Corneal burn to both eyes.
16. Utility generation plant—1990	480 V ac	480 V ac breaker Feeder board	Was placing breaker in cubicle, the breaker was closed and did not open due to mechanical failure.	The closed breaker caused an arc flash.	Unknown	Burn to shoulder.
17. Utility transmission—1990	Outdoor substation	4160 V ac conductors	Testing to determine if the conductors were energized to the transformer bank.	When the electrician placed the Simspon 260 m probe on one phase and the other probe on the second phase the meter shorted causing an arc flash.	Unknown	Burns to both hands.

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Table C.1—Case histories of arc-flash incidents *(continued)*

Setting	Electric system	Equipment	Activity	Event	Apparel	Outcome
18. Utility generation plant—1989	480 V ac	Panel board 480 V ac breaker	Two electricians were taking current readings in the breaker compartment with a clamp-on type ammeter on the motor phase conductor from the breaker.	A fault occurred that caused an arc flash in the breaker compartment.	Unknown	Second and third degree burns to both employees' faces.
19. Utility generation plant—1988	161 kV ac	Plant switchyard Disconnect switch	Two electricians were inspecting lightning arrestors and disconnect switch insulators from a non-insulated aerial lift bucket.	While moving bucket to a new position, there was an arc flash from an energized 161 kV switch to the bucket.	Non-flame resistant winter clothing Hard hat Safety glasses	Two employees had second and third degree burns from the arc flash and burning clothing. One employee died from burn injury complications.
20. Utility generation plant—1988	480 V ac	480 V ac breaker board	Electrician was testing for voltage on the 480 V ac breaker studs with an HV probe.	When the studs were contacted, an arc flash occurred in the breaker compartment.	Hard hat Safety glasses	Second degree burns to hands and first degree burns to face and forearms.
21. Industrial site—1986	2400 V ac	2400 V ac breaker board that feeds a 1250 HP pump	Opening a breaker.	Electrician opened a 2400 V breaker under load.	Cotton clothing	Electrician had second and third degree burns from the arc flash and burning clothing to 70% of body. Second electrician had first and second degree burns to hands from rescue efforts.

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Table C.1—Case histories of arc-flash incidents *(continued)*

Setting	Electric system	Equipment	Activity	Event	Apparel	Outcome
22. Utility, transmission—1970	13 kV ac	Energized 13 kV substation bus 13 kV potential transformer	Lineman was in an insulated aerial lift maneuvering an energized "stinger" during the installation of a potential transformer with help of an electrician using a "hot stick" from a ladder.	The electrician caused an arc flash between the bucket and the substation steel setting fire to the lineman's shirt. The assistant superintendent climbed onto the structure to aid the injured. When he touched the bucket a second arc flash occurred setting his clothing on fire.	Unknown	Both the lineman and superintendent died from injuries from their burning clothing.
23. Utility, transmission—1967	13.8 kV ac	13.8 kV oil-filled circuit breaker (OCB) 13 kV synchronous condenser	Periodic inspection of the condenser had been performed with the circuit deenergized. The circuit was reenergized and a substation control alarm went off. The operator and electrician went to the switchhouse breaker room to investigate.	The employees attempted to close the 13.8 kV OCB causing an arc flash. The arc flash caused the OCB to explode throwing flaming oil throughout the room.	Unknown	The electrician was able to exit the room with his clothing on fire. The operator did not get out of the room. Both died of burn injuries.
24. Utility, transmission—1981	46 kV ac	46 kV gang operated three-phase switch 46 kV OCB	Completed testing B and C phases. Conducting resistance test on the A-phase OCB insulator using a "micrometer."	"When the employee applied the test probe to the insulator, an arc flash occurred because the A-phase of the 46 kV gang operated switch did not open when the circuit was cleared.	Polyester/cotton shirt	Second and third degree burns on two-thirds of the upper torso. Polyester melted on his skin.
25. Utility, transmission—1973	46 kV ac	46 kV transmission line switch structure, wood poles 46 kV switch	Lineman was dead-ending a conductor on a switch structure working from a ladder.	The lineman's head contracted the energized 46 kV switch above him causing him to fall.	Unknown	Lineman had burns over two-thirds of his body, which resulted in his death.

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Table C.1—Case histories of arc-flash incidents *(continued)*

Setting	Electric system	Equipment	Activity	Event	Apparel	Outcome
26. Utility transmission—1984	161 kV ac	Double circuit 161 kV steel transmission tower 161 kV jumper Zinc based paint	Lineman was painting a steel transmission tower with energized jumpers above and below the tower arm where he was working.	Dripping paint from the bucket to the 161 kV energized jumper caused an arc-flash explosion.	Unknown	Lineman was blown off the tower, but had on a "safety" which prevented his fall. He received first degree burns to his forearms
27. Utility transmission substation—1969	161 kV ac	161 kV OCB OCB phase bushing on bus side	The OCB was cleared on the line side, but not the bus side. The electrician climbed on the breaker to attach temporary safety grounds.	The electrician contacted the energized OCB bushing on the bus side of the breaker causing an arc flash that blew him off the breaker.	Unknown	Electrician had third degree burns to his arms and a fractured skull.
28. Mine site—2000	995 V ac	1 kV ac breaker panel.	Replacing a 480 V ac breaker panel with a 1 kV ac breaker panel. With new panel installed, the 7200 V ac transformer was reenergized. At first the AMR-type ground check circuit prevented the new panel from energizing. The electrician started removing the 1.0 kV panel when the ground check circuit shorted and energized the panel.	While moving the panel, it contacted the line side connections which were energized at 995 V causing an arc flash.	Unknown	Electrician had serious burns to both hands and face.

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Table C.1—Case histories of arc-flash incidents *(continued)*

Setting	Electric system	Equipment	Activity	Event	Apparel	Outcome
29. Industrial site, substation—1996	35.4 kV ac	Substation main 34.5 kv overhead switch support column Cable support bracket 34.5 kv bus substation bus insulator	Employee was installing an HV cable support bracket on the support column. Supervisor was holding the bracket in place while employee stood on fiberglass step ladder. This operation was next to an energized 34.5 kV bus.	The employee reached out and contacted the bus insulator causing an arc flash.	Unknown	Employee had burns on his face, hands, waist, and upper back. He also had electrical internal burn injuries. He died from these injuries.
30. Industrial site—1994	480 V ac	480 V secondary circuit breakers 480 V power distribution panel Below-pier electrical vault	Three employees were reinstalling 480 V breakers into an energized distribution panel in an electrical vault. The crew installed one breaker.	While installing the second breaker, an arc flash occurred. The cause of the arc was excessive moisture in the glass fiber reinforced polyester (GFRP) molded insulating material between the 480 V phases during breaker installation.	Non-fire resistant clothing	One employee was engulfed in flames and died from burn injuries. The other two had serious burn injuries.
31. Industrial site—1992	2.3 kV ac	MCC 250 V multimeter 2.3 kV fuses	An electrical worker (nine months experience) and a Journeyman electrician were performing operation checks on MCC. Compartment heater found inoperative. Journeyman went to get single-line drawing.	Worker thought a set of fuses was low voltage (could not read fuse label). He touched the meter probes to fuses which were energized at 2.3 kV causing an arc flash.	Eye and face protection Electrical hazard safety shoes	The worker had first, second, and third degree burns over 30% of his body.

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Table C.1—Case histories of arc-flash incidents *(continued)*

Setting	Electric system	Equipment	Activity	Event	Apparel	Outcome
32. Mine site—1997	480 V ac	MCC 480 V main circuit breaker 480 V feeder circuit breaker	The main breaker in the MCC would not reset. The electrical supervisor had all the 480 V load shut down and then shut off all the breakers in the MCC. He tried again to reset the main breaker.	Supervisor opened the panel door to take readings on the main breaker with a multi-meter. The probe simultaneously touched the energized terminal and a grounded nut that was used to mount the breaker in the MCC (the breaker was improperly mounted). This caused an arc flash to occur.	Non-flame resistant clothing	The supervisor's clothing ignited and he had second degree burns over 75% of his body. He died the following day. Two other supervisor who were assisting to trouble shoot the MCC received arc-flash burns to the face, arms, and hands.
33. Industrial site—1987	2.4 kV ac	2.4 kV draw-out, fused-contactor assembly in a motor starter	An electrician taking reading with a multimeter. The meter operating range was set at 500 V ac. The fused-contactor was energized at 2.4 kV.	When the meter probe contacted the 2.4 kV fused-contactor, it exploded causing a three-phase arc flash in the assembly.	Unknown	The electrician sustained massive burn injuries and subsequently died. There was no evidence of electrical shock.
34. Industrial site—1994	480 V ac	480 V ac main breaker	Moving a no. 6 AWG ground wire in a 480 V cabinet.	The electrician allowed the ground wire to contact an energized phase lug of the main breaker resulting in a three-phase arc flash.	Unknown	The electrician sustained third degree burns to neck, arms, and torso.

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Table C.1—Case histories of arc-flash incidents *(continued)*

Setting	Electric system	Equipment	Activity	Event	Apparel	Outcome
35. Industrial site—1998	480 V ac	480 V frame type KC breaker with solid state trip unit	Employee was trouble shooting the "trip" button on the breaker. The button was stuck behind the panel it normally stuck through and was located just below the hole. He opened the cubicle door, squatted down, and attempted to realign the button.	The button came apart and the linkage dropped down into the energized bus bar initiating an arc flash.	Safety glasses. HV switching gloves.	Employee sustained second degree burns to his arms and face.
36. Industrial site—1995	480 V ac	480 V circuit breaker Air conditioner unit 13.2 kV–480 V transformer fed directly to the breaker	The system was not deenergized. Two employees approached the breaker panel board which already had its cover and door removed. One employee either reset the breaker or started to remove it.	As the employee started to reset/work on the breaker, an arc flash occurred which caused a second arc flash at the block connection at the switchgear.	Unknown	One employee nearest breaker sustained burns over 87% of his body. The second employee sustained burns over 50% of his body and later died.
37. Industrial site—1993	12 kV ac	12 kV circuit breaker Circuit breaker cubicle	Electrician was working inside the energized 12 kV breaker cubicle without insulating barriers. He was working on the breaker controls.	An arc flash occurred on the exposed phases of the supply side of the breaker.	Unknown	The electrician suffered third degree burns to his face, body, and arms.
38. Industrial site—1991	480 V ac	480 V circuit breaker Rotary switch to wind turbine	Electrician was replacing a 480 V breaker serving a wind turbine. He turned a rotary switch to what he thought was the open position to isolate the breaker.	When he touched the breaker terminals to discharge stored energy, an arc flash occurred because of the backfeed from a transformer.	Unknown	The electrician's shirt ignited and he suffered deep burns to his face and arms.

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Table C.1—Case histories of arc-flash incidents *(continued)*

Setting	Electric system	Equipment	Activity	Event	Apparel	Outcome
39. Industrial site—1991	600 V ac	600 V circuit breaker	Electrician was measuring voltage on the load side of a 125 A, 600 V breaker.	Something caused an arc flash in the breaker.	Unknown	Electrician was burned over 60% of his body and died.
40. Utility generation plant—1985	4160 V ac	4160 V circuit breaker	Three employees were going to remove a 4160 V breaker. They went to the wrong breaker, which was energized.	When the breaker contacts were opened, an arc flash occurred.	Unknown	One electrician suffered second and third degree burns. The other two suffered burns to their face and hands. All were hospitalized.
41. Industrial site—1984	6.9 kV ac	6.9 kV transformer bank 6.9 kV OCB	Three employees were in the OCB building to inspect equipment, change the OCB oil, and clean transformer bushings. Number 1 employee was isolating the equipment. He removed the load from the secondary side of the transformer, then used an ammeter to measure current to the transformer, which showed no load.	He then opened the OCB, which caused an arc flash and the building ignited.	Unknown	Employees no. 1, 2, and 3 were in the building when the arc flash occurred. All suffered burns, but employee no. 1 died from the injuries.

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Table C.1—Case histories of arc-flash incidents *(continued)*

Setting	Electric system	Equipment	Activity	Event	Apparel	Outcome
42. Industrial site—1998	2.3 kV ac	2300 V, 1000 Hp motor Temporary protective grounds	Electrician had swapped the motor leads at the contactor to change the rotation of the motor. Then, operator was to return motor to service. He closed the no-load switch.	The no-load switch arc flashed phase-to-phase because grounds were not removed. Hot gases pushed the door open where operator was standing. 	Safety glasses Fire resistant pants and shirt Arc flash suit including hood	PPE prevented burn injury.
43. Utility generation plant—2002	4160 V ac	4 kV ac breaker. Temporary protective safety grounds.	Electrician was to install a safety ground on the load side copper stabs of the 4 kV breaker. Electricians two and three were assisting by holding the breaker's arc shield to expose the stabs. While attempting to attach the first ground, he approached the high-side, energized, stabs of the breaker with the safety ground.	An electrical arc flash occurred from the energized breaker stab to the grounded safety ground. The fault migrated into a three-phase arcing fault.	The employee handling ground: FR switching jacket, safety glasses, leather gloves, and hard hat Employee on left side of cubicle: 100% cotton shirt, safety glasses, leather gloves, hard hat Employee on right side of cubicle: 65/35 polyester/ cotton shirt, safety glasses, leather gloves, and hard hat	Employee handling ground: first and second degree burns to neck and face (3% total body). Employee on left: first and second degree burns to his arm (3% total body). Employee on right: second and third degree burns to arm and upper body (13% total body).

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Table C.1—Case histories of arc-flash incidents *(continued)*

Setting	Electric system	Equipment	Activity	Event	Apparel	Outcome
44. Utility generation plant—1985	13.8 kV ac	13.8 kV disconnect Temporary safety grounds Step-ladder	Employee was to attach grounds to the generator side of the disconnect from a step-ladder.	As he started to attach the ground on the deenergized bus, the ladder tipped causing the ground conductor to contact the energized side of the disconnect. An electrical arc flash occurred.	Unknown	Employee had second and third degree burns to hand, arm, and face.
45. Utility generation plant—1991	480 V ac	480 V breaker	.Employee was "racking-in" the 480 V breaker with it in the "closed" position.	An electrical arc flash occurred.	Unknown	Employee was burned on the arm.
46. Utility generation plant—1948	Unknown	Compensator Disconnect switch	The employee switched a ventilating fan switch to start the fan.	An electrical arc flash occurred in the compensator, and it blew up.	Unknown	Employees clothing ignited and burned. He had over 50% total body burns and died.
47. Utility transmission—1963	13 kV	13 kV substation bus	The employee was removing temporary jumpers on a 13 kV line.	The employee contacted the C-phase bus with his body causing an arc flash to occur.	Unknown	Burns caused death of the employee.
48. Utility transmission—1968	13 kV	13 kV bus	A hydraulic press was being moved and it fell into a 13 kV energized bus.	An electrical arc flash occurred.	Unknown	The employee was burned.

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Table C.1—Case histories of arc-flash incidents *(continued)*

Setting	Electric system	Equipment	Activity	Event	Apparel	Outcome
49. Utility generation plant—2002	4160 V ac	4 kV breaker.	The employee was racking the breaker and it would not completely rack-in, lacking about an inch. The employee removed the arc shield from the breaker to observe the shutter levers. He reached in to check whether the levers were “free.”	An electrical arc flash occurred when the employee’s hand contacted the A-phase shunt which was energized.	Polyester/cotton shirt.	80% of his shirt burned away. He received third degree burns to his right hand, arm, and right shoulder and second degree burns to face, neck, left arm, and hand.

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MAIB Safety Bulletin 4/2010

MAIB SAFETY BULLETIN 4/2010

Catastrophic failure of a capacitor and explosion in an 11kV harmonic filter on board the passenger cruise vessel RMS *Queen Mary 2*

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MAIB SAFETY BULLETIN 4/2010

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Steve Clinch
Chief Inspector of Marine Accidents

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BACKGROUND

At 0426 (UTC+1) on 23 September 2010, the cruise liner RMS *Queen Mary 2* was approaching Barcelona when one of 12 capacitors in a harmonic filter[1] failed **(Figure 1)**, accompanied by a loud explosion. The explosion resulted in extensive damage to the surrounding electric panels and caused the vessel to black out. There were no navigational hazards nearby, main power was restored at 0455 and the ship was able to get back underway at 0523.

Figure 1

Capacitor which failed causing it to rip off the foundation bolts and rise approximately 60cm

The harmonic filter was connected directly to 11kV bus bars and was located in a compartment within the aft main switchboard room. The blast forced the steel door to the compartment out through its frame and also caused serious damage to an adjoining steel door into the main switchboard room **(Figure 2)**. The stiffeners on the bulkhead of the compartment were buckled and the steel cover plate on a cross-flooding duct was blown out into the main switchboard room. Fortunately there were no personnel in the vicinity. The steel casing of another capacitor in the same group was found to have bulged severely and was possibly on the verge of failure **(Figure 3)**.

There was evidence of smoke and heat in the compartment **(Figure 4)**, and any fire was probably extinguished by water from the hi-fog system. Two hi-fog outlets, one in the harmonic filter compartment and the other in the main switchboard room, were activated in the wake of the blast.

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[1] Harmonic filter: Alternating current (AC) motors for electric propulsion operate on variable frequency and voltage. Thyristors used in the power converters result in voltage distortion. Passive harmonic filters, when applied correctly, are designed to attenuate the harmonic currents which result in excessive voltage distortion and which may otherwise damage or disrupt equipment connected to the electrical network.

Figure 2

Damaged steel door to the harmonic filter compartment

Figure 3

Top view of two capacitors indicating one which had developed a severe bulge due to internal pressurisation

Figure 4

Soot staining on the blown-out doors of the harmonic filter casing

ANALYSIS

Preliminary findings of the investigation carried out by the manufacturer of the capacitor indicate that the capacitor had deteriorated gradually. The monitoring device based on current unbalance detection did not give any indication of the fault developing. The dielectric oil appeared to have vaporised due to internal short circuiting, causing internal pressure to build up and resulting in the oil leaking out and being sprayed onto the high voltage bus bars. The oil vapour is likely to have provided a conducting path between the live phases of the 11kV terminals, resulting in a major arc flash event.

Catastrophic failure of large capacitors has been experienced in land-based high voltage installations. One or more of the following can cause such failures:

- Excessive harmonic currents and voltages produced by electronic power converters during the voltage rectification process in variable speed electric motor drives.
- Transient voltage spikes and 'line notching' produced in thyristor power converters.
- Radiated heat from resistors and electromagnetically induced heating from inductor coils within passive harmonic filters.
- High ambient temperatures or blocked ventilation.
- Degradation due to ageing.

The MAIB, in co-operation with the manufacturers of the harmonic filters, the ship owner and subject matter experts, is carrying out a detailed investigation to find the exact technical cause of the failure on board RMS *Queen Mary 2*.

RECOMMENDATION

S2010/139 Operators of vessels with electric propulsion which have large capacitors in harmonic filters, should urgently:

- Inspect the capacitors and check for any physical distortion, unusual smells (indicating dielectric fluid leakage) and signs of external overheating.
- Ensure that the cooling and ventilation systems are functioning correctly.
- Calibrate and function test any fault detection or condition monitoring system fitted.
- Ensure that if there is a history of capacitors in the equipment needing to be replaced, the underlying causes are understood.
- Carry out a thorough check for the cleanliness of all exposed conductors as well as for external signs of chaffing damage on high voltage cables.

Owners and operators of vessels or offshore platforms who have experienced catastrophic failures or bulging of capacitors in harmonic filters are requested to inform the MAIB by e-mail (maib@dft.gsi.gov.uk) using the title 'Capacitor failures' and include the name of the vessel or platform, the system manufacturer, and the date and place of installation.

This information is for internal use only and will be treated in the strictest confidence.

Issued December 2010

Annex K

MAIB Flyer to Shipping Industry

MAIB

MARINE ACCIDENT INVESTIGATION BRANCH

FLYER TO THE SHIPPING INDUSTRY

RMS Queen Mary 2: The catastrophic failure of a capacitor and explosion in the aft harmonic filter room

At 0425 on 23 September 2010, as the passenger liner *RMS Queen Mary 2* (*QM2*) was approaching Barcelona, a loud explosion was heard from the direction of the aft main switchboard (MSB) room. Within a few seconds, all four of the podded propulsion motors shut down. A few seconds later, the vessel suffered an electrical blackout. Thick black smoke was seen to be coming from the aft MSB room. Fortunately, the vessel was clear of navigational hazards and no one was injured.

By 0439, the crew had confirmed that the explosion had taken place in the aft harmonic filter[1] (HF) which was situated in a compartment next to the aft MSB room. After establishing with thermal imaging cameras that there were no hot spots, they ventilated the area and isolated the aft HF and MSB from the rest of the 11000 volt electrical network.The crew were able to restore some electrical power supplies and, by 0523, *QM2* was underway using two propulsion motors powered from the forward MSB. Subsequent inspection of the aft HF revealed that one of its capacitors **(Figure 1)** had failed catastrophically due to internal over-pressure and another had developed a severe bulge.

Figure 1

Harmonic filter capacitors

The vessel had a history of HF capacitor failures, at an average rate of one per year. Although the exact cause of the capacitor failures could not be determined, it was concluded that capacitor degradation was probably caused by a combination of transient high voltage spikes due to frequent switching operations and occasional network overvoltage fluctuations. The capacitor deterioration had not been detected, and because there were no internal fuses or pressure relief devices, it had continued until the capacitor casing failed catastrophically.

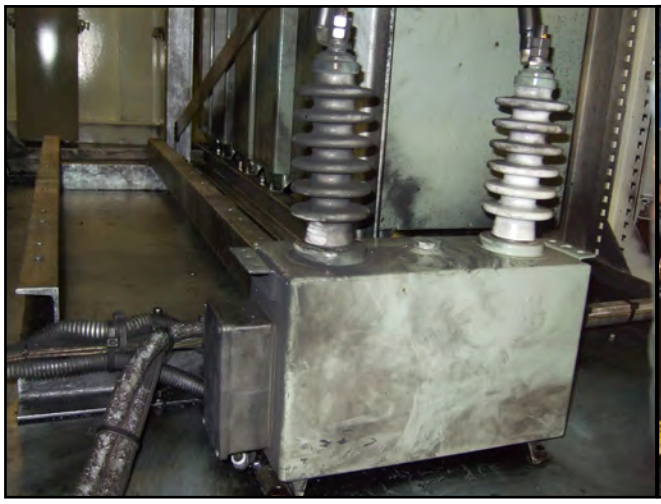
Although the aft HF circuit breaker disconnected the HF from the rest of the electrical network to isolate the electrical fault, the disruption was likely to have caused electrical instability in the electrical network which led to the loss of propulsion and blackout. The vessel's alarm logs were found to contain early warnings about the impending failure approximately 36 minutes before the accident. However, as the vessel's alarm systems regularly logged more than one alarm every minute, this information was not seen and could not be acted upon.

Current imbalance detection system (EstaSym 3C by Vishay Electronics GmbH)

The only protection against catastrophic failure of the capacitors was a current imbalance detection system. It consisted of a current transformer **(Figure 2a)** which was connected to the capacitor circuit. Under normal conditions, little or no current should have flowed through the transformer. When a capacitor degraded, the current flow across the circuit became unbalanced and induced a current in the transformer's secondary winding. The system was set to give an alarm when the imbalance reached 400mA and to trip at 800mA.After the accident, the transformer's windings were found to have failed **(Figure 2b)**. There had not been any alarms on this part of the system for several years and it was likely that the imbalance detection system had not worked for some time.

[1] Harmonic filter: Alternating current (AC) motors for electric propulsion operate on variable frequency and voltage. Thyristors used in the power converters result in voltage distortion. Passive harmonic filters mitigate the effects of excessive voltage distortion.

Figure 2a



The current transformer used in imbalance current detection system

Figure 2b

Damaged transformer windings

This caused the alarm display to read 0mA giving a false indication that the capacitors were in good condition.

Although detection of an unbalanced current was the only protection system for the harmonic filters, it had no backup and did not fail safe. Routine tests of the system were by the secondary current injection method, and by-passed the transformer.

SAFETY LESSONS

- Protection systems for critical equipment must 'fail safe', and should be thoroughly tested at regular intervals to prove that all sub-components are functioning correctly. **In particular, harmonic filters with current imbalance protection systems should be thoroughly checked by a competent person at the earliest opportunity.**

- Awareness of the damaging effects of harmonic distortion needs to improve throughout the marine industry as the risks to equipment caused by harmonic distortion are likely to increase significantly as variable speed AC electric motors become more widely used in ships.

- Regular monitoring of electrical networks should be undertaken to provide early warning of deterioration. Monitoring equipment should be capable of detecting transient voltage spikes, resonances, and excessive harmonic distortion levels (either continuously or periodically).

- Procedures need to be established to manage distortion levels in the event that power conversion equipment or harmonic mitigating equipment fails.

- Machinery alarms should be regularly reviewed and prioritised so that the risk of the watchkeeper being overloaded with too many alarms and not notice those from critical systems can be minimized.

This flyer and the MAIB's investigation report are posted on our website: www.maib.gov.uk

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