

12th Mediterranean AIS Expert Working Group
Rome, 22nd October 2014

MAREΣ 12/4/1
19 September 2014

MAREΣ network activity and monitoring report
Submitted by EMSA and Italy

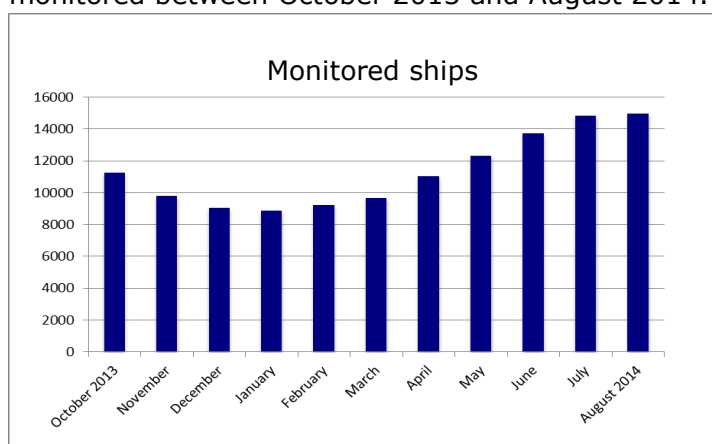
<i>Executive summary</i>	The document provides participating countries with updates on the MAREΣ monitoring activities carried out in the period October, 2013 – September 2014.
<i>Action to be taken</i>	As per paragraph 4.
<i>Related documents</i>	MAREΣ 11/4/1 (12th November 2013)

1. Introduction

MAREΣ has been providing the central SafeSeaNet with AIS data gathered from the MAREΣ participating Member States.
This report summarises the MAREΣ activities and provides analyses of the services provided by the regional AIS system.

2. Level of activity

The level of activity was monitored on a daily basis, and the average number of vessels was high during the reporting period. Figure 1 and table 1 show the average number of vessels monitored between October 2013 and August 2014.



Month	Year	Monitored ships
August	2014	14,971
July	2014	14,856
June	2014	13,738
May	2014	12,345
April	2014	11,053
March	2014	9,665
February	2014	9,223
January	2014	8,869
December	2013	9,053
November	2013	9,794
October	2013	11,253

Figure 1 & Table 1: The average number of vessels monitored on a daily basis (October, 2013 – September 2014)

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Figure 1 shows the highest number of vessels was detected during summer period. This increase in traffic density is due to the duck effect. The latter results in a maritime traffic increase, especially for pleasure crafts. The number of AIS messages transacted via SSN is, on average, about 47.000.000 messages per month (see tab. 2). These results have been obtained by querying the ITCG MAREΣ dBase, where all the incoming information is stored according to the following criteria:

- Avoidance of duplication.
- Storage of all dynamic data.
- Storage of static and voyage-related data only once, unless they change.

Member State	Total number of AIS acquired information by MAREΣ (October 2013 – August 2014)										
	October	November	December	January	February	March	April	May	June	July	August
Bulgaria	1.282.865	960.473	923.660	839.047	736.609	857.691	928.630	1.021.512	1.029.815	1.101.907	1.088.793
Cyprus	2.411.719	1.648.397	1.069.350	1.056.491	1.016.475	1.555.653	1.920.220	2.222.294	2.223.920	2.709.298	3.079.361
Spain	17.314.924	14.499.589	14.268.290	14.114.107	12.916.516	14.003.257	16.990.501	18.294.794	18.532.767	23.053.226	18.894.649
France	1.362.081	1.586.486	1.574.037	1.591.040	1.445.523	603.874	552.315	742.190	616.454	661.778	947.971
Greece	4.378.119	3.675.363	3.708.342	3.750.700	3.217.145	3.583.314	4.011.460	4.330.418	4.537.276	5.205.540	5.068.873
Croatia	1.872.404	1.542.628	1.244.199	1.280.446	1.349.453	1.595.713	1.540.716	1.827.571	1.701.393	1.696.926	1.550.288
Italy	13.136.994	10.971.071	11.045.415	10.920.567	10.070.917	11.258.793	12.539.437	16.443.831	17.438.642	20.154.254	19.767.618
Malta	713.119	587.059	765.269	732.394	560.492	567.844	568.902	515.834	387.230	681.842	666.932
Portugal	2.702.415	3.118.381	2.644.263	2.751.467	2.563.884	3.073.303	2.788.975	2.926.874	2.838.905	3.694.426	3.868.294
Romania	1.963.984	1.787.950	1.949.773	1.810.347	1.633.293	1.798.054	1.911.316	2.150.720	1.997.461	2.543.616	2.970.781
Slovenia	1.217.927	1.114.849	1.140.190	1.180.967	984.859	1.138.142	1.160.195	854.314	931.257	792.877	792.583
Total	48.356.551	41.492.246	40.332.788	40.027.573	36.495.166	40.035.638	44.912.667	51.330.352	52.235.120	62.604.571	58.696.143

Table 2: Total number of AIS information acquired by MAREΣ (October 2013 – August 2014)

3. MAREΣ network status

3.1. Network malfunctions/incidents

During the observation period, 132 network malfunctions (incidents), involving national proxies and requiring a human intervention in order to restore normal operations, were reported by MAREΣ.

The reported incidents were mainly due to breakdowns in communications between the MAREΣ Core application and the national proxies. All of these incidents had an effect on the information flow with the concerned participating countries, and also had an impact on the general functioning of MAREΣ. The reported cases are shown in table 3.

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Submitted reports		
Month/Year	Number of reports	Involved networks
October, 2013	10	France (8), Malta (1), Cyprus (1)
November, 2013	7	Slovenia (3), France (2) Bulgaria (1), Cyprus (1)
December, 2013	9	France (3), Bulgaria (2), Croatia (3), Cyprus (1)
January, 2014	6	Croatia (1), France (1), Bulgaria (2), Portugal (2)
February, 2014	5	Port. Islands (2), France (1), Bulgaria (1), Croatia (1)
March, 2014	11	France (3), Slovenia (5), Spain (2), Malta (1), Greece (1)
April, 2014	18	Cyprus (1), France (3), Greece (3), Croatia (1), Italy (1), Malta (5), Port. Islands (1), Slovenia (2)
May, 2014	11	Spain (1), France (1), Croatia (1), Malta (4), Prt. Islands (1), Slovenia (3)
June, 2014	17	France (2), Greece (3), Croatia (1), Malta (4), Romania (1), Slovenia (6)
July, 2014	22	Cypro (1), Spain (1), France (2), Greece (3), Port. Islands (1), Romania (1), Slovenia (13)
August, 2014	18	Bulagria (2), Cyprus (1), Spain (1), France (5), Greece (4), Italy (1), Slovenia (4)
Total:	135	

Table 3: Reported Malfunctioning (incidents)

These incidents were detected by the MAREΣ “proxy monitoring” application, highlighting in red the communication breakdown between MAREΣ and the national proxy involved (see example in fig. 2). Whenever there were communication breakdowns, the ITCG contacted the national points of contact and requested the re-establishment of the connection.

Proxies List								
Status	User Name	Country	Disconnection Time Inte...	No Rx Data Time Interval	Msg Rx	Msg Tx	Link Availability %	Proxy Availability %
🟢	EMSA_ADR	Adriatic sea		00:00:07	2.4	9.7	99.818	99.878
🔴	EMSA_ALB	Albania	118 days 17:46:36	123 days 18:09:53	0	0	.186	.186
🟢	EMSA_BGR	Bulgaria		00:00:07	.9	34.6	99.054	99.113
🟢	EMSA_CYP	Cyprus		00:00:07	1.4	34.5	98.899	98.959
🟢	EMSA_ESP	Spain		00:00:07	43.3	69.4	98.799	98.859
🟡	EMSA_FRA	France		00:01:11	0	34.9	99.484	99.544
🟢	EMSA_GRC	Greece		00:00:07	7.7	35.3	98.009	98.068
🟢	EMSA_HRV	Croatia		00:00:07	2.2	4.8	97.657	97.72
🟢	EMSA_ITA	Italy		00:00:07	10.1	28.7	98.888	98.948
🟢	EMSA_MLT	Malta		00:00:10	.8	35.1	99.106	99.165
🟢	EMSA_MNE	Montenegro		00:00:07	.2	4.8	94.49	94.55
🟢	EMSA_PRT	Portugal		00:00:07	6.4	34.9	98.616	98.684
🔴	EMSA_PTISL	Portugal - Islands	6 days 14:04:07	6 days 14:39:06	0	0	.283	.283
🟢	EMSA_ROU	Romania		00:00:07	.9	34.7	99.344	99.404
🟢	EMSA_SSN	SafeSeaNet			0	34.6	99.937	99.997
🟡	EMSA_SSR	Satellite Ship Report		19 days 18:51:33	0	34.3	81.93	81.956
🟢	EMSA_SUB	Subscriber			0	73.7	99.824	99.894
🟢	EMSA_SVN	Slovenia		00:00:17	0	34.7	98.5	98.559
🟡	NAISP_BACKUP	E.M.S.A.		20:42:48	0	0	95.247	95.274
🟢	REMPEC_JORDAN	Jordan		00:00:07	1.3	1.3	69.396	69.405

Figure 2: MAREΣ “proxy monitoring” application.

In comparison with the last activity report, presented at MAREΣ (12th November 2013), the total number of incidents increased from 86 to 132.

Considering the relative amount of incidents per months, the incident rates were:

- April, 2011 to March, 2012 activity report: $86/12 = 7.17$ [incidents/month]
- June, 2012 to September, 2013 activity report: $114/16 = 7.13$ [incidents/month]
- Last period (October, 2013 to August, 2014): $135/11 = 12.27$ [incidents/month]

Thus, the incident rate increased in the last period of 4.87 (current window activity report).

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3.2. Incident processing time

MAREΣ monitored the availability of links, including the connection status of national systems and the exchange of AIS notifications between these systems and MAREΣ, and with the SSN central application. During the observed period, a number of significant downtimes were detected. The total duration of unavailability (downtime) during the observed period was 2,155.32 hours, and malfunctions processing time varied from 26.6 – 360.77 hours per month. Both the number of incidents that occurred within the MAREΣ network, and the time needed to process them, are shown in table 4.

Submitted Reports												
Month	Oct. 2013	Nov. 2013	Dec. 2013	Jan. 2014	Feb. 2014	Mar. 2014	Apr. 2014	May 2014	Jun. 2014	Jul. 2014	Aug. 2014	Total
Report 1	340	65	113	175	41	1590	80	717	1142	492	106	
Report 2	130	935	259	288	390	108	171	429	2076	308	139	
Report 3	385	473	265	850	198	1422	844	4380	85	214	466	
Report 4	165	205	40	120	1678	115	60	680	1250	517	1400	
Report 5	326	170	1120	130	2979	1450	1840	7912	12700	720	170	
Report 6	5741	52	106	33	/	5640	180	1775	1744	144	1280	
Report 7	467	993	124	/	/	21	3405	1020	180	390	65	
Report 8	1737	/	1655	/	/	528	2340	191	941	501	300	
Report 9	4273	/	1280	/	/	4590	200	975	135	6251	180	
Report 10	107	/	/	/	/	1456	62	1475	80	66	120	
Report 11	/	/	/	/	/	4313	845	737	76	180	30	
Report 12	/	/	/	/	/	/	76	/	182	980	30	
Report 13	/	/	/	/	/	/	2540	/	85	180	578	
Report 14	/	/	/	/	/	/	170	/	50	113	111	
Report 15	/	/	/	/	/	/	2970	/	420	725	236	
Report 16	/	/	/	/	/	/	1000	/	80	47	65	
Report 17	/	/	/	/	/	/	250	/	420	289	2340	
Report 18	/	/	/	/	/	/	120	/	/	20	184	
Report 19	/	/	/	/	/	/	/	/	/	113	/	
Report 20	/	/	/	/	/	/	/	/	/	65	/	
Report 21	/	/	/	/	/	/	/	/	/	153	/	
Report 22	/	/	/	/	/	/	/	/	/	320	/	
No. Reports	10	7	9	6	5	11	18	11	17	22	18	135
Minutes	1367 1	2893	4962	1596	5286	2123 3	1715 3	20291	21646	1278 8	7800	12931 9
Hours (Est.)	227. 85	48.2 2	82.7 0	26.6 0	88.1 0	353. 88	285. 88	338.18	360.77	213. 13	130	2155.3 2

Table 4: Incidents processing time [min]

Table 4 shows that the resolution time for malfunctions has increased, which indicates a need for greater attention in order to ensure the technical availability of the AIS networks.

3.3. Minor incidents

Table 5 illustrates the numbers of minor breakdowns in communications between MAREΣ and national proxies that were reported by MAREΣ. The durations were reported by MAREΣ as

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being very short (from milliseconds to a few minutes). These incidents have been automatically restored by the MAREΣ CORE and the proxy application.

Participant Country	Breakdown in communication (n.) – October 2013 - August 2014										
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Bulgaria	30	23	27	27	82	109	49	53	77	72	98
Cyprus	165	137	215	215	87	123	176	209	96	77	90
Spain	94	11	3	3	8	30	11	8	5	151	88
France	49	17	5	5	4	187	6	13	2	7	79
Greece	25	21	52	52	345	698	246	200	40	32	69
Croatia	35	15	12	12	9	35	3085	24	15	10	61
Italy	23	24	7	7	222	40	12	12	9	6	69
Malta	30	15	30	30	32	32	38	42	89	16	48
Portugal	139.506	29	152	152	957	304	12	465	22	53072	141
Port. Is. (**)	/	/	38	38	949	55	12	463	11	35584	136
Romania	25	20	18	18	7	36	11	66	57	14	78
Slovenia	58	46	55	55	50	60	31	17	32	12	53

Table 5: Breakdowns in communications [MS/month]

Table 6 hence shows the link availability during the period from October, 2013 to August, 2014. The values in between 97% and 99% have been highlighted in yellow, while those below 97% in red.

	Link Availability [%]												
Month/MS	Bulgaria	Cyprus	Spain	France	Greece	Croatia	Italy	Malta	Portugal	Port. Islands	Romania	Slovenia	Average
Oct, 2013	99,899	99,821	99,92	99,903	99,876	99,914	98,949	99,91	99,834	/	99,912	99,688	99,784
Nov, 2013	98,41	99,54	99,98	99,98	99,81	99,96	99,98	99,96	97,83	74,07	99,93	99,34	97,399
Dec, 2013	96,39	98,61	99,41	99,46	99,06	99,44	99,48	99,47	99,47	99,48	99,48	99,21	99,080
Jan, 2014	97,961	99,928	99,985	99,99	99,114	99,982	99,052	99,952	98,774	98,765	99,995	99,712	99,434
Feb, 2014	98,84	99,438	99,496	98,535	98,658	99,574	98,676	99,564	99,515	99,484	99,539	99,325	99,220
Mar, 2014	99,941	99,816	97,692	99,981	99,33	97,55	99,976	99,926	99,959	99,962	99,95	99,778	98,655
Apr, 2014	99,921	99,768	99,97	99,939	99,056	99,869	97,748	99,937	99,886	99,886	99,647	99,962	99,632
May, 2014	99,795	99,092	99,954	99,969	99,88	99,944	99,965	82,314	99,949	90,309	99,872	91,878	96,910
Jun, 2014	97,199	97,119	97,206	97,219	96,698	96,91	96,399	97,079	97,217	97,225	96,467	95,667	96,867
Jul, 2014	99,876	98,825	99,436	99,938	99,338	99,917	99,942	99,936	90,913	83,114	99,927	99,941	97,592
Aug, 2014	98,831	99,644	98,997	99,68	99,399	99,647	99,258	99,681	99,608	99,789	99,612	94,839	99,082
Total average													98,514

Table 6: Link availability since October, 2013 to August, 2014

The last column illustrates the average for each involved Country, while the last column the total average in the relative month over all the involved Countries. Finally, the bottom right value, in bold, indicates the total average for all the involved Countries over the considered time window.

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Since November 2013 the Portuguese Island proxy started to transmit and its link availability has been unstable, although showing a better behaviour each month. Another unusual trend emerges, i.e. that of June 2014, where all Countries' link availability resulted under 98%.

Finally, other isolated spikes emerge, in the sense of low availability. These involve Bulgaria (December, 2013), Spain (March, 2014), Greece, Croatia, Slovenia and Italy (June, 2014), Malta (May, 2014), Portugal (July, 2014), Portugal Islands (May and July 2014) and Slovenia (May, June, and August 2014).

4. Action required

Participating states are invited to take note of the information.