

11th Mediterranean AIS Expert Working Group
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MAREΣ 11/4/1
November 12th, 2013

MAREΣ network monitoring report
Submitted by Italy

<i>Executive summary</i>	The document provides participating countries with updates on the MAREΣ activities carried out in the period June 2012 – September 2013.
<i>Action to be taken</i>	As per paragraph 4.
<i>Related documents</i>	MAREΣ 10/2 (26 June 2012)

1. Introduction

The Mediterranean AIS Regional System (MAREΣ) allows the exchange of AIS information among participating Member States. The information gathered is also forwarded to EMSA to be integrated in SSN. This report is summarizing the activities and the services provided by MAREΣ in the period June 2012 – September 2013.

2. Level of activity

Figure 1 together shows the average number of vessels monitored between June 2012 and September 2013:

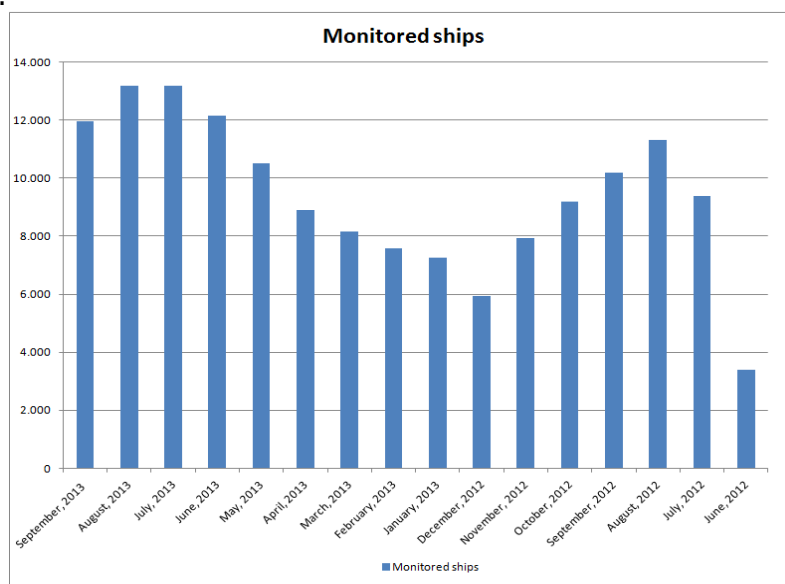


Figure 1: number of vessels monitored (June 2012 – September 2013)

The figure shows that the highest number of vessels was detected during the summer, when the increasing in traffic density is due to the duck effect and to the huge presence of pleasure crafts. The number of AIS messages per month gathered by MAREΣ is, on average, about 43.000.000. These results have been obtained by querying the 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.

The number of AIS information acquired by MAREΣ per month and per participating country is shown in Table 1 below:

Member State	Total number of AIS information acquired by MAREΣ (June 2012 – September 2013)															
	June	July	August	September	October	November	December	January	February	March	April	May	June	July	August	September
Bulgaria	1,284,391	1,418,365	1,188,216	1,258,222	937,346	750,381	746,378	709,532	684,764	823,239	920,455	1,459,657	1,399,490	1,254,360	1,532,847	1,011,127
Cyprus	3,876,958	3,891,518	3,899,258	2,967,215	1,891,248	1,451,289	818,585	863,266	1,181,978	1,630,038	1,907,428	2,768,011	3,295,714	3,707,370	4,026,219	2,360,980
Spain	11,729,830	12,157,789	13,410,095	12,530,631	13,120,438	12,614,756	12,216,798	12,711,095	11,393,747	12,888,596	16,197,524	69,265,923	25,501,504	19,868,390	19,444,211	17,098,340
France	1,449,207	1,574,582	1,854,412	1,857,634	1,936,381	1,487,983	1,375,161	1,097,681	1,400,361	1,595,335	4,042,027	3,718,729	1,571,696	613,365	1,202,070	1,780,562
Greece	3,217,433	3,746,901	4,071,153	3,274,812	3,798,898	3,082,448	2,766,336	2,746,821	2,916,687	3,827,542	3,956,722	4,623,723	4,069,238	4,075,174	4,271,355	4,297,356
Croatia	/	/	/	/	/	/	/	/	/	/	/	/	/	1,926,986	1,283,165	1,856,410
Italy	14,029,158	18,774,679	15,459,634	12,074,172	10,531,250	7,999,967	7,993,973	8,363,792	7,876,593	10,495,192	11,571,646	13,455,650	14,983,200	18,485,402	16,578,133	14,582,414
Malta	754,318	680,420	587,545	634,256	769,792	843,344	811,717	547,277	575,568	1,219,183	1,259,240	1,556,760	793,318	818,683	682,961	701,647
Portugal	2,402,757	2,851,403	2,721,304	3,074,358	2,916,518	2,402,979	2,348,422	2,043,386	3,383,434	3,457,285	16,021,375	10,810,744	3,271,789	2,371,434	2,552,961	2,624,316
Romania	2,208,226	1,952,453	1,833,344	1,889,973	1,662,840	1,312,519	1,480,272	1,407,885	1,262,838	1,418,052	1,504,350	1,822,791	1,442,416	1,764,562	1,876,576	1,637,156
Slovenia	399,938	217,492	198,718	151,800	249,928	278,877	357,819	335,193	306,269	342,794	855,152	819,243	1,102,975	1,141,386	912,267	1,013,066
Total	41,352,216	47,265,602	45,223,679	39,713,073	37,814,639	32,224,543	30,915,461	30,825,928	30,982,239	37,697,256	58,235,919*	110,301,231*	57,431,340	56,027,112	54,362,765	48,963,374

Table 1: Total number of AIS information acquired by MAREΣ (June 2012 – September 2013)

At the beginning of 2013, France requested Italy three separate AIS data flows, with different downsampling, for the following projects:

- MARYLIN, all information coming from a specific maritime area, with a downsampling of **one minute**;
- SPATIONAV-2 and ENVISIA, all information gathered by MAREΣ according to the current downsampling policy (**six minutes**).

The French request was fulfilled using the MAREΣ platform together with a new Italian national system called PELAGUS, capable of handle large amounts of AIS information. In April 2013,

Spain also requested to provide back its own AIS information with a downsampling of one minute.

In April and in May 2013 MAREΣ registered a large amount of the information stored (58.235.919 and 110.301.231), caused by an increase of the information from Spain, Portugal and France, included in the maritime area of interest of the MARYLIN project. Starting from June, while remaining the three flows required by French, the information acquired were stored in MAREΣ with the normal downsampling of six minutes.

Croatia joined the European Union on July 1st, 2013, and therefore it has been included within this report since then.

3. MAREΣ network status

3.1. Network malfunctions/incidents

During the observation period, 86 network malfunctions (incidents), involving national proxies and requiring a human intervention 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 the following table 2:

Month/Year	Number of reports	Submitted reports
		Involved networks
June, 2012	4	Spain (2), Greece (1), Mediterranean AIS (1)
July, 2012	9	Spain (1), Cyprus (1), Italy (2), Greece (2), France (1), Slovenia (2)
August, 2012	6	Bulgaria (2), Slovenia (1), Italy (1), France (2)
September, 2012	11	France (5), Greece (1), Malta (1), Romania (1), Slovenia (2), Italy (1)
October, 2012	6	Bulgaria (1), Slovenia (2), Italy (2), France (1)
November, 2012	9	Slovenia (2), France (3), Romania (1), Italy (2), Spain (1)
December, 2012	4	Italy (3), France (1)
January, 2013	7	France (4), Slovenia (1), Malta (1), Bulgaria (1)
February, 2013	12	Romania (2), Greece (1), Malta (1), France (2), Cyprus (1), Slovenia (3), Italy (1), Spain (1)
March, 2013	4	France (4)
April, 2013	13	Romania (2), Greece (3), France (4), Spain (2), Malta (1), Bulgaria (1)
May, 2013	5	Cyprus (1), Bulgaria (1), Spain (1), Greece (1), France (1)
June, 2013	6	Greece (1), France (2), Cyprus (1), Spain (2)
July, 2013	2	Malta (1), Slovenia (1)
August, 2013	5	Malta (2), France (2), Portugal (1)
September, 2013	11	France (4), Slovenia (2), Cyprus (1), Malta (1), Croatia (1), Portugal (1), Romania (1)
Total:	114	

Table 2: Reported incidents

The incidents detected by the MAREΣ “proxy monitoring” application are presented in Figure 2, highlighting in red the communication breakdown between MAREΣ and the national proxy involved:

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.

Whenever there were communication breakdowns, the ITCG contacted the national points of contact and requested the re-establishment of the connection. All cases were also reported to EMSA.

Comparing with the last activity report the incident rate decreased in the last period by 7.125.

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 1.491 hours, and malfunctions processing time varied from 14 to 255 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 3 below:

Month	Reports	Minutes	Hours (est.)	Submitted reports												
				Rep. 1	Rep. 2	Rep. 3	Rep. 4	Rep. 5	Rep. 6	Rep. 7	Rep. 8	Rep. 9	Rep. 10	Rep. 11	Rep. 12	Rep. 13
June, 2012	4	2.847	47	30	615	576	1.626									
July, 2012	9	5.053	84	3.880	70	76	40	115	105	500	76	191				
August, 2012	6	1.318	22	415	225	390	45	145	98							
September, 2012	11	4.030	67	1.355	1.257	40	415	75	125	190	390	60	15	108		
October, 2012	6	833	14	61	100	222	130	30	50	240						
November, 2012	9	1.500	25	260	67	30	80	120	300	103	360	180				
December, 2012	4	1.670	28	70	1.030	450	120									
January, 2013	7	15.319	255	6.144	145	7.730	355	705	120	120						
February, 2013	12	9.241	154	298	69	5.985	675	180	240	955	32	107	525	90	85	
March, 2013	4	3.763	63	84	100	785	462	302	2.030							
April, 2013	13	7.388	123	125	240	402	670	40	240	230	133	80	92	4.440	426	270
May, 2013	5	5.374	90	3.529	740	150	35	745	175							
June, 2013	6	852	14	270	95	130	115	62	180							
July, 2013	2	1.606	27	170	1.436											
August, 2013	5	14.893	248	5.418	1.680	915	5.260	1.620								
September, 2013	11	13.800	230	491	1.170	65	8.951	1.346	480	120	240	140	277	520		
Total	114	89.487	1.491													

Table 3: Incidents processing time [min]

Table 3 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 4 illustrates the numbers of minor breakdowns in communications between MAREΣ and national proxies that were reported by MAREΣ:

Participant Country																
Breakdown in communication (n.) – October 2012 - September 2013																
	June	July	August	September	October	November	December	January	February	March	April	May	June	July	August	September
Bulgaria	87	278	243	130	786	59	28	20	47	25	22	22	22	8	29	30
Cyprus	94	151	132	185	104	93	39	35	40	101	45	855	343	151	226	165
Spain	44	191	27	31	56	477	31	23	22	24	37	85	42	22	41	94
France	22	45	15	4	18	29	10	6	34	27	31	27	12	6	17	49
Greece	23	41	16	29	14	31	7	16	150	30	20	4	5	5	7	25
Croatia	/	/	/	/	/	/	/	/	/	/	/	/	/	12	20	35
Italy	172	52	13	6	28	91	40	7	14	6.721	140	142	1	14	11	23
Malta	13	75	30	7	9	24	7	10	5	13	22	2	6	172	7	30
Portugal	22	48	19	43	35	31	29	9	24	21	13	3	10	49	11.025	139.506
Romania	43	47	29	35	23	60	8	25	30	20	20	9	9	21	10	25
Slovenia	45	61	46	58	37	67	24	28	25	0	0	52	14	37	45	58

Table 4: Breakdowns in communications

These incidents have very short durations (from milliseconds to a few minutes) and they are automatically restored by the MAREΣ CORE and the proxy application. Also these minor incidents have an impact on the overall link availability.

Table 5 indicates the monthly overall availability of each Country, considering all the incidents occurred:

Link Availability [%]												
Month	Bulgaria	Cyprus	Spain	France	Greece	Croatia	Italy	Malta	Portugal	Romania	Slovenia	Average
June, 2012	99.175	99.706	99.621	99.502	99.788	99.658	99.703	99.827	99.841	99.524	99.708	99.641
July, 2012	99.307	99.453	99.974	99.491	99.555	99.663	99.639	99.689	99.710	99.511	99.562	99.596
August, 2012	98.046	99.800	99.873	99.875	99.878	99.969	99.880	99.837	99.886	99.847	99.589	99.680
September, 2012	99.724	99.173	99.875	99.762	99.842	92.060	99.890	99.888	99.874	98.908	99.803	98.992
October, 2012	98.048	99.586	99.608	99.617	99.662	95.611	99.431	99.678	99.656	99.661	99.069	99.057
November, 2012	99.564	99.682	99.686	99.709	99.773	99.751	99.213	99.795	99.779	99.677	99.658	99.662
December, 2012	99.632	99.894	99.940	99.951	99.970	99.923	99.961	99.962	99.959	99.950	99.879	99.911
January, 2013	99.897	99.950	99.951	99.933	99.943	99.956	99.965	99.942	99.959	99.887	99.851	99.930
February, 2013	99.858	99.928	99.781	99.966	98.604	99.564	98.713	99.974	99.941	98.557	99.779	99.515
March, 2013	100.00	99.997	99.994	100.00	99.927	99.697	100.00	99.993	100.00	100.00	99.962	99.928
April, 2013	98.774	99.537	99.371	99.795	98.270	99.538	99.782	99.793	99.810	99.959	99.742	99.488
May, 2013	98.102	98.864	99.525	99.982	99.999	99.976	99.975	99.997	99.998	99.980	99.146	99.595
June, 2013	99.905	99.454	99.647	99.675	99.419	99.954	99.994	96.698	99.973	99.948	99.779	99.495
July, 2013	99.941	99.852	99.911	99.948	99.930	99.934	99.031	99.754	99.891	99.926	96.668	99.526
August, 2013	99.939	99.718	99.928	99.910	99.953	99.927	99.956	87.832	94.886	99.933	99.687	98.334
September, 2013	99.850	99.706	99.851	99.736	99.867	99.696	99.828	93.443	74.962	99.479	93.194	96.328

Table 5: Link availability since June 2012 to September 2013

The monthly overall availability of each Country remained over 99%, except for September, 2012 (98.992%), August (98.334%), and September 2013 (98.328%). The fall of the link availability percentage occurred in August and September 2013 was mainly due to the change of MAREΣ ISP, which was required by a few participating Countries and took longer than the expected time to restore the connection.

4. Action required

Participating States are invited to note the submitted information and to take the appropriate actions.