

A new Operating and Maintenance Information System for Observation Systems of Turkish State Meteorological Service

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Turkish State Meteorological Service (TSMS) has been modernizing and expanding its meteorological observing network which includes systems like Weather Radars, Automated Weather Stations, Radiosondes and Lightning Detection Systems continuously as a part of Global Observing System (GOS).

Operational reliability of observing systems is crucial for TSMS and WMO. Regular maintenance and calibration of systems is one of the critical aspects of operating those networks properly and efficiently and to maintain the availability of data of high quality. On the other hand, the proper calibration of systems for accurate measurements has been a serious matter. Managing sophisticated assets' maintenance is a complex activity that involves matching maintenance requirements against limited resources. In the maintenance world, system operational time, reliability, maintainability and the cost efficiency are critical factors. It is getting hard following, keeping alive and reliable all those critical systems.

In this scope, TSMS has been carrying out a new "Operating and Maintenance Information System" (OMIS) to follow operational, calibration and maintenance status of all inventories of Observation Systems operated. Purposes of applying this information system are being able to manage the complex configurations of advanced technology vehicles, following calibration activities, planning human source dealing with operating and maintenance, using proactive maintenance approaches rather than reactive, having improved reporting and dashboard capabilities, providing a visibility to scheduled maintenance information, increasing maintenance efficiency while lowering operational costs, providing maintenance actors with comprehensive, accurate and timely information at all stages of the maintenance process and providing an easy to use mechanism to plan, to execute and to monitor maintenance activities.

Reporting current status of the observing systems

Current status of systems like radars, AWOS, Radiosonde etc. Can be observed from the system.

Location	Gözlem Sistemi	Gözlem Sistemi Grubu	Status
balıkesir radar	Radar-H-K-K-S-S (rev.1) (Pitubishi Radar) @ Radar H C K S S 3	Radar	Fully Mission Capable
istanbul radar	Radar-H-K-K-S-S (rev.1) (Pitubishi Radar) @ Radar H C K S S 2	Radar	Fully Mission Capable
hatay radar	Radar V C K S (rev.1) (Vaisala Radar-K) @ Radar V C K D S 7	Radar	Fully Mission Capable
trabzon radar	Radar V C K S (rev.1) (Vaisala Radar-K) @ Radar V C K D S 9	Radar	Fully Mission Capable
muğla radar	Radar V C K S (rev.1) (Vaisala Radar-K) @ Radar V C K D S 5	Radar	Fully Mission Capable
antalya radar	Radar V C K S (rev.1) (Vaisala Radar-K) @ Radar V C K D S 6	Radar	Fully Mission Capable
samsun radar	Radar V C K S (rev.1) (Vaisala Radar-K) @ Radar V C K D S 8	Radar	Fully Mission Capable
izmir radar	Radar V C K S (rev.1) (Vaisala Radar-K) @ Radar V C K D S 4	Radar	Non Mission Capable
zonguldak radar	Radar-H-K-K-S-S (rev.1) (Pitubishi Radar) @ Radar H C K S S 1	Radar	Fully Mission Capable
ankara radar	Radar-G-C-K-D-S (rev.1) (Geomatronik Radar) @ Radar G C K D S 0	Radar	Fully Mission Capable

Assigning a personal for a corrective(failure) or periodic maintenance

Manager can assign a technical staff for maintenance. Assigned staff can access documentations regarding the related system to solve the problem or executing maintenance and upload document to the OMIS when traveling.

Task	Start	Finish	Progress
1 Global Güneşlenme gddk	Jun 30 12:55	Jun 30 13:55	0%
2 Global Güneşlenme	Jun 30 12:55	Jun 30 13:55	0%

Reporting maintenance activities. Informing for approaching and past maintenance activities

Past and planned maintenance activities can be observed from OMIS and it warns for approaching and passed maintenances.

Activity ID	Start Time	End Time	Status
mgm-2014-07-01-0002	11:00	12:00	Completed
mgm-2014-07-01-0001	11:00	12:00	Completed
mgm-2014-06-30-0002	11:00	12:00	Completed
mgm-2014-06-30-0001	11:00	12:00	Completed
mgm-2014-06-26-0024	11:00	12:00	Completed
mgm-2014-06-26-0023	11:00	12:00	Completed
mgm-2014-06-20-0038	11:00	12:00	Completed

Following inventories and spares for each depot or location

Since all inventories and spare parts are created virtually, they can be followed for each system and location. Parts can be changed from the system and can be sent between locations on the OMIS as in real life.

Part Name	Location Code	Location Name
Ball Bearing 61860, azimuth	MGM H-OMGI Depo	MGM H-OMGI Depo
Cogged Belt, PC2 8MGT-128...	MGM H-OMGI Depo Faal Depo Kontrol Noktası	MGM H-OMGI Depo F
Ball Bearing 61908-2R51, azi...	MGM H-OMGI Depo Gayri Faal Depo Kontrol Noktası	MGM H-OMGI Depo G
Ball Bearing 61816-2R51, azi...	MGM H-OMGI Depo Kabul Noktası	MGM H-OMGI Depo K
Gear, Cyclo FC-A25G-i59, az...	GM GS Dairesi	Genel Müdürlük Gözle
AC Servo Motor, 600W,200V...	Türkiye	Türkiye
CAN-Bus Module C8 Cansas (...)	1. Bölge (İstanbul)	1. Bölge (İstanbul)
Ball Bearing 61826, elevation	2. Bölge (İzmir)	2. Bölge (İzmir)
Gear, Cyclo FC-A35G, elevat...	AYDIN	AYDIN
Cogged Belt, PC2 8MGT-800-...	17227	ÇILDIR AYDIN (206 C
	17227 Bakım Yeriindeki Faal Deposu	17227 Bakım Yerinde
	17227 Bakım Yeriindeki Gayri Faal Deposu	17227 Bakım Yerinde

Warning about approaching calibrations and life time of each system and subsystems

One of the challenges of Observing Systems is following calibration of the sensors and systems. OMIS can produce warnings regarding calibration of each subsystem.

Part Name	Serial Number	Current Location	Next Calibration
Rizgar Yön Sensörü Lastem	902214	On S-OMGI-206-1 (rev.1) (OMGI) @ O-206-0032	31/01/2015
Direk Güneşlenme Tracker		Ankara Bölge (17133)	31/01/2015
BAGIÇ SENSOÖRÜ	192101	On H-OMGI MOBİL Etiler (rev.1) (H-OMGI MOBİL Etiler) @ H21	10/03/2015
Rizgar Yön Sensörü Lastem	902215	On S-OMGI-206-1 (rev.1) (OMGI) @ O-206-0032	31/01/2016
Açık Siper 1 Metre	905020	On S-OMGI-206-1 (rev.1) (OMGI) @ O-206-0032	31/01/2016
Rotronik Sicaklık ve Nem sensörü AP101A	902216	On Açık Siper 1 Metre (rev.1) (Açık Siper 1 Metre) @ 905020	31/01/2016
Açık Siper 2 Metre	905021	On S-OMGI-206-1 (rev.1) (OMGI) @ O-206-0032	31/01/2016
Rotronik Sicaklık ve Nem sensörü AP101A	902217	On Açık Siper 2 Metre (rev.1) (Açık Siper 2 Metre) @ 905021	31/01/2016
CH1-NIP Direk Güneşlenme Radyasyonu Ölçer	902218	On S-OMGI-206-1 (rev.1) (OMGI) @ O-206-0032	31/01/2016
Tracker Güneş İzleyici	902219	On CH1-NIP Direk Güneşlenme Radyasyonu Ölçer (rev.1) (CH1-NIP Direk Güneşlenme Radyasyonu Ölçer) @ 902218	31/01/2016

Reporting history of each inventory

System can follow history of each inventory as well the each part. Past of each part including failures, calibrations, locations is recorded. Following frequent failures for each system is possible.

Event Type	Event Date	Description	Details
Maintenance Work Order Closed	26/06/2014 13:55		Maintenance
Fault Closed	26/06/2014 13:55	radar görüntü geniyor	Fault radar
Maintenance Work Order Closed	26/06/2014 13:53		Maintenance
Fault Closed	26/06/2014 13:53	dalga klavyuzu çalılık	Fault dalga k
Testing	26/06/2014 13:36	Bakım sırasında	Radar V C K S
Maintenance Work Order Started	25/06/2014 17:00		Maintenance

Configurable Inventory	Event Date	Status	Event
Radar V C K S (rev.1) (Vaisala Radar-K) @ Radar V C K D S 4	19/06/2014 17:01	Non Mission Capable	Fault 'td
Radar V C K S (rev.1) (Vaisala Radar-K) @ Radar V C K D S 4	19/06/2014 16:50	Fully Mission Capable	Mainten
Radar V C K S (rev.1) (Vaisala Radar-K) @ Radar V C K D S 4	19/06/2014 16:48	Non Mission Capable	Mainten
Radar V C K S (rev.1) (Vaisala Radar-K) @ Radar V C K D S 4	04/12/2013 17:07	Fully Mission Capable	Invento

Reporting performance of technical staff

Following performance of another important issue during operating and maintain observing systems. Skilled staffs as well as staffs need more training. could be determined with statistics.

First Name	Last Name	Email	Id	Status	User	Department List
A Fuat	TÜRKER	ft_rker27@hotmail.com	155	Active	afturker	4. Bölge-ANTALYA BÖ
A İrfan	ÇİÇEK	z_ic_k@mgm.gov.tr	1043	Active	acicek	
A Mehmet	ASLAN	i_3s_m@mgm.gov.tr	2303	Active	maslan	7. Bölge-Kayseri-Gem
Abdulkadir	YAVUZ	z_a_uz@mgm.gov.tr	134	Active	ayavuz	4. Bölge-Antalya-Ispa
Abdulkadir	KARATAŞ	a_ite_m-25@hotmail.com	1052	Active	abkaratas	
Abdullah	KILIÇ	z_ili_@mgm.gov.tr	2468	Active	akilic	8. Bölge-Konya-Ereğli
Abdullah	DOĞAN	i_3d_g_@mgm.gov.tr	2990	Active	abdogan	10. Bölge-SAMSUN BÖ

Life Cycle Support IT solution for operating and maintain of Observing Systems brings advantages to technical staff and managers like:

- Increase maintenance efficiency while lowering operational costs.
- Provide maintenance actors with comprehensive, accurate and timely information at all stages of the maintenance process.
- Provide an easy to use mechanism to plan, to execute and to monitor maintenance activities.
- Provide (situational awareness) a single view of the entire fleet through visual attributes for the decision makers at various levels, ranking from high level (strategic) to operational level.
- Exhibit the status, upcoming maintenance requirements and due items of all owned assets.
- Be able to manage the complex configurations of advanced technology vehicles.
- Use proactive maintenance approaches rather than reactive.
- Meet the growing expectations of maintenance world.
- Have improved reporting and dashboard capabilities.
- Be continuously improved to meet the demands of an expanding networks.
- Provide a visibility to scheduled maintenance information.
- Use a modern IT architecture and provide advanced capabilities such as a role-based web browser interface.
- Support portable wireless devices.
- Provide an infrastructure enabling smooth transition to Performance Based Logistics.