

OPERATIONAL MANAGEMENT OF 400 AWOSs FROM SEA LEVEL TO 2000 M HEIGHT COVERING AN AREA OF 800.000 KM²

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INTRODUCTION

An additional automatic surface observational system is being implemented in Turkey. A more comprehensive approach includes planning for all components of the automated weather observing system (AWOS), from the sensors to communication systems in real-time, to round the clock monitoring of the system performance, to maintenance teams, to spare parts, to a data base, to free and open deliverance of data in real-time in the TSMS (Turkish State Meteorological Service) intranet to all possible uses and users.

Acquisition of 150 AWOSs was done via a national bidding by the TSMS which selected the Vaisala Oy as the provider of the equipment. Prior to this, in 2000 there was bidding with the Turkish Meteorological Firm (ELİTE AŞ) for placing about 206 AWOSs in the west part of the country on a project in the financial cooperation with World Bank. In addition different projects about hydrological purposes and preventing of avalanche and flood were realized in the different areas such river basins, city centers and mountainsides. Up to now, about 400 AWOSs are in place and soon is envisaged that all (630) AWOSs are installed in running.

The choice of locations to install the stations require a minimum guarantee against vandalism and good partnering institutions for the maintenance and securing physical safety of the installations. In this context, special agreements were made with key governmental and private organizations.

OPERATIONAL MANAGEMENT OF 400 AWOSs

Turkey is a huge country with almost 800.000 km² area and has two mountainous peninsulas (Anatolia and Thrace) between two continents, Asia and Europe. This geographical property gives a great diversity not only on fauna-flora but also on climatology. Four seasons can be easily seen in a specific day in the country. It is a challenging task to meet operational requirements considering the geographical and climatological conditions. Both designers and technicians who are responsible for deciding type, location, communication system, energy supply, maintenance and calibration program of AWOS must take into account all these inputs:

- How many AWOS does it needed?
- Where AWOSs must be installed?
- Which type of AWOSs should be chosen?
- Which parameters should be measured in the station?
- Are all sensors chosen for AWOS adequate for both seaside and mountain?
- How technicians are be informed about any failures?
- Who will repair?
- In which way do technicians use to reach AWOS?
- What is the method of maintenance and calibration of the AWOS sensors?
- Which must be preferential, maintenance or calibration or repairment?
- Does local remedy need for AWOS failure?
- How 400 AWOSs are be monitored?

LOCATION OF SOME AWOSs ON TURKEY MAP

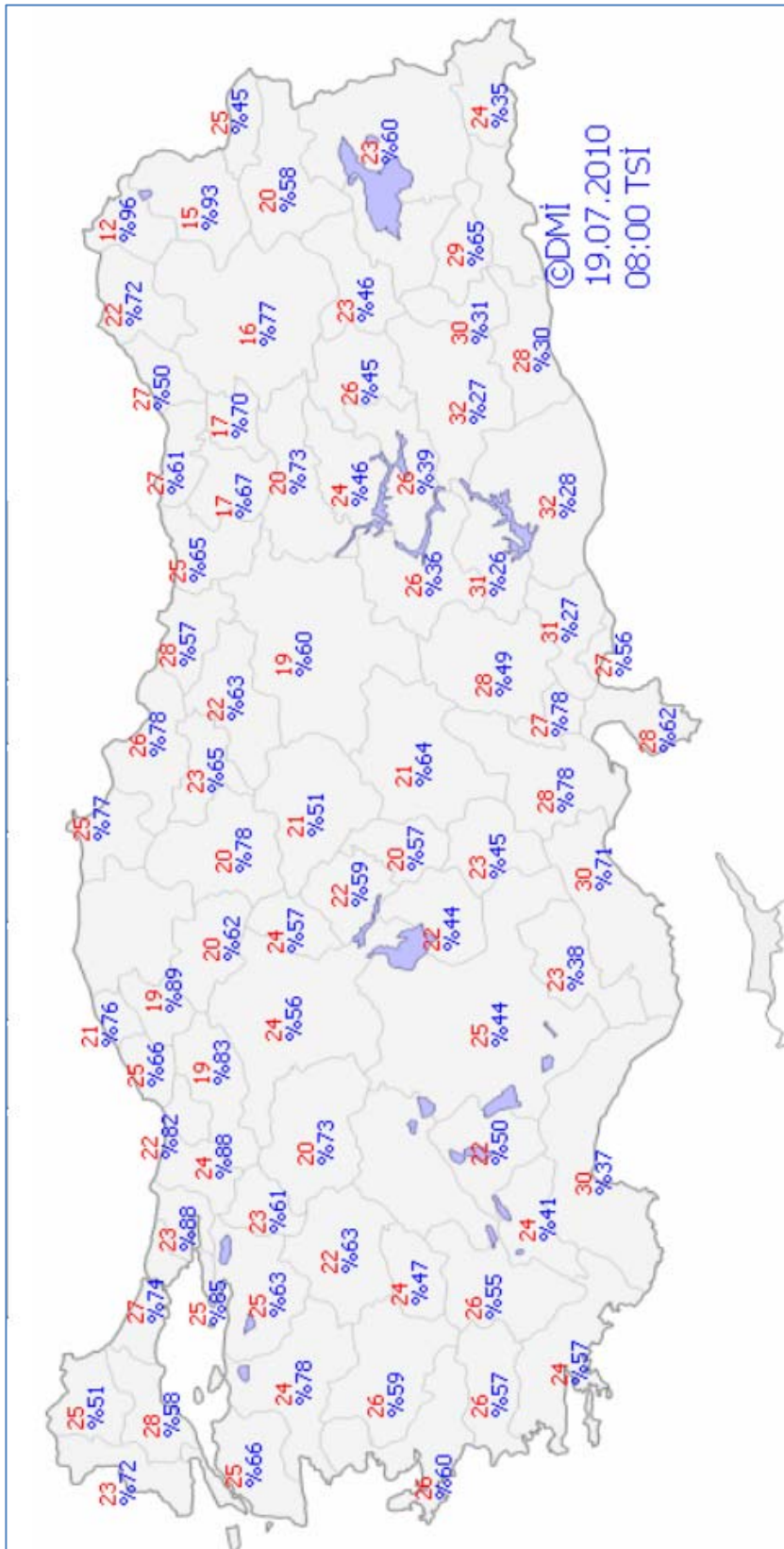


Figure 1: An instantaneous measurements of temperature and humidity via TSMS internet site (<http://www.dmi.gov.tr/sondurum/turkiye.aspx?g=H&h=SN>)

AWOS NETWORK IN TURKEY

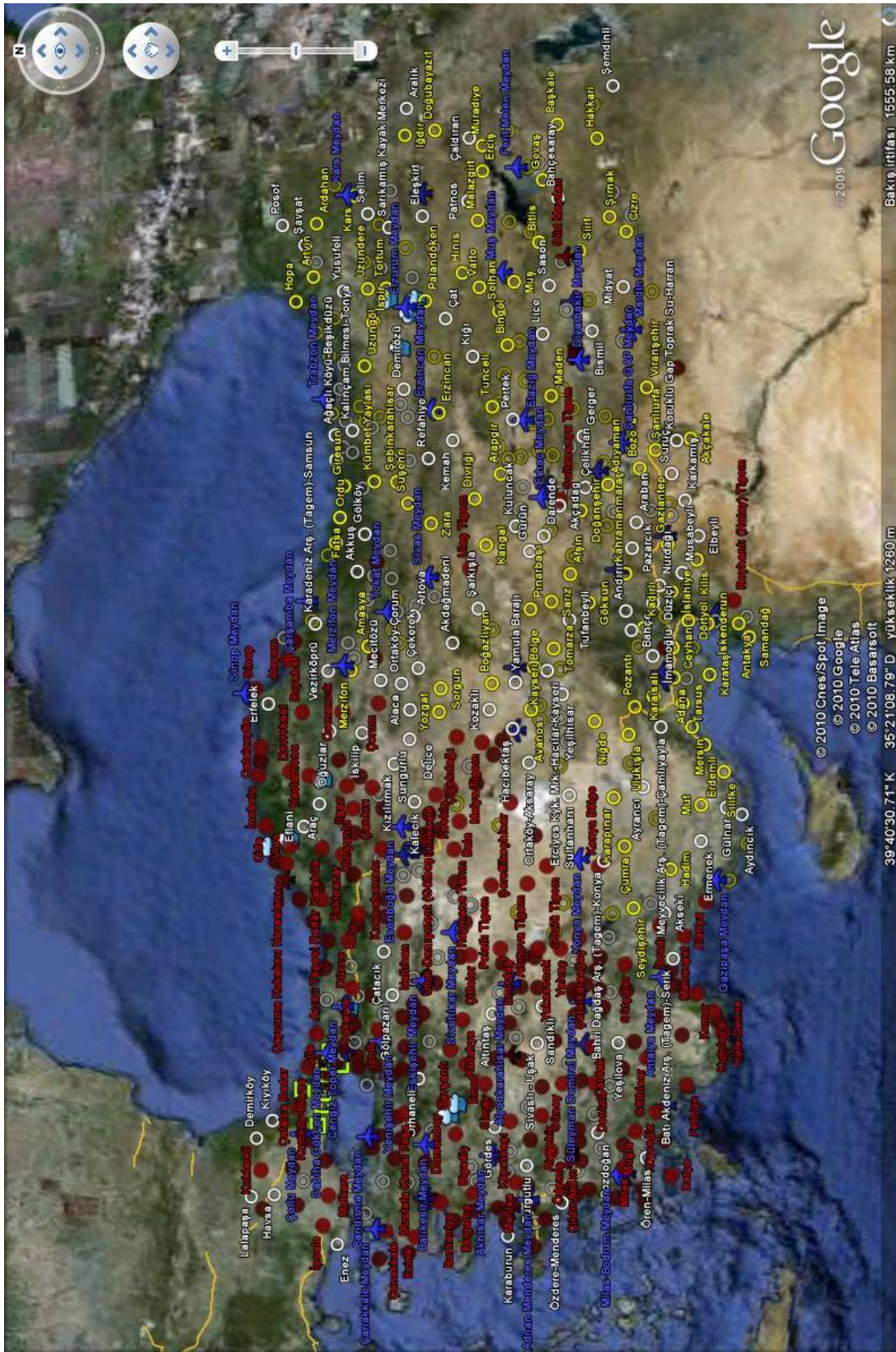


Figure 2: 618 (206 + 150 + 10 + 46 + 10 + 196) AWOSs placement over Turkey



Figure 3: AWOS between buildings



Figure 4: AWOS located in a plateau



Figure 5: AWOS in a forest



Figure 6: AWOS in a shoulder of a mountain



Figure 7: AWOS in the coast



Figure 8: AWOS maintenance in Atatürk Airport, İSTANBUL



Figure 9: Replacement the oring of wind sensor



Figure 10: Preparing to journey in order to install an AWOS in a station area

CONCLUSION

- A team which has 16 engineers and technicians is responsible for designing, installing, monitoring, maintenance and troubleshooting of all kind of AWOS.
- Moving and reconfiguring of AWOS is also done by the same team.
- All kind of technology used in the AWOS systems must be know from all personnel in the team.
- On job training must be done for the team in order to update its knowledge and ability.
- Working over mast for changing spare parts of wind sensors and snow height sensors is not suitable for personnel who is acrophobia.
- Making a program for annual maintenance is also important in the name of reaching to all stations all over Turkey.
- Warnings come from stations about AWOS must be solved as soon as possible. But some rules which are for financial and administrative belongs to law for officers sometimes return to a constraint.
- Because of 4 seasons can be seen in the country, maintenance program cannot be realized in winter time easily. Resent seasons is not enough to complete the program.
- Maintenance team is located in the center, in Ankara. Many stations are located far from Ankara. Arriving to stations sometimes takes almost 20 hours by car. It is a serious problem for the time schedule.
- Growing of vegetation in the observing park of AWOS prevents some measurements, especially precipitation that is installed in the height of 100 cm. it is needed to saw to stop this effect.
- In principle at least two technical personnel are sent to the sides to be able to manage duty correctly. So period of the job is a constraint to prepare a maintenance program not only for the financial limits but also for private life of the personnel.
- Surviving in the sides is not straightforward for technicians because of the long time as social and many kinds of troubleshooting as technical aspects.
- Topographic and climatological conditions of the stations can reason more problems to make AWOS stop or breakdown such as precipitous slope, valley, summit, coastal affects and snowstorm, flood, avalanche, lightning.
- Infrastructure of the city also affects the launching conditions of AWOS. Permanence of electricity, drainage of the side and grounding of observing park are related with the performance of AWOS.
- Vandalism is also a critic question for AWOS located in wild area such as forest, mountain, coast, public garden etc.