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Enhanced meteorological accuracy test trial CoMETFire

Weather Services Play a Central Role

The importance of weather services for field artillery operations has been the focus of many recent studies. Accordingly, weather service accuracy was selected as the central theme at the CoMETFire accuracy test firing held in Denmark in September, 2003. The Finnish Defense Forces participated in the trial as a member of NATO's Partnership for Peace (PfP) program, with Vaisala providing the weather services to the Finnish team at the trial.

Two NATO working groups on meteorological services have concluded that 67 % of errors in the opening of artillery fire are caused by weather, while 22% depend on the aerodynamics of the ammunition and 10% on differences in muzzle velocity. Consequently, the most effective way to influence the accuracy of artillery fire is to reduce the influence of weather by using advanced weather observation methods.

The objective of the CoMET-fire test firing was to fire some 600 shots with the German PzH 2000 (Panzerhaubitze 2000) howitzer at a range of 27 kilometers. During the test firing period, several groups of weather servicemen were positioned in various locations in North Jutland, seven of them utilizing sounding systems and one using a wind profiler.

Assessing the importance of weather data

During the rehearsal, 45 soundings were performed daily. To



The Finnish weather services team consisted of Sr. Lt. Reijo Miettinen, Sakari Kajosaari and Päivi Peltoniemi of Vaisala (from left to right).

study the effect of the terrain on the weather messages, some of the soundings were made concurrently, with a distance of up to 140 km between sounding sites. Soundings were also performed within the same area at intervals of 20 minutes to assess the stability of the weather. The total number of soundings amounted to 540, carried out on 12 days during the two-week rehearsal period. Additionally, test soundings were made at the beginning of the rehearsal with all of the seven sounding systems.

The weather service's main task was to calculate fire control data by utilizing the weather computation model produced by the weather service. This virtual model was complemented with calculated messages in NATO's METCM weather message format. These were further used as the basis for calculating a more accurate model, in the new meteorological grid format (METGM), covering the entire rehearsal area.

Meteorological experts supported Finland's team

The Finnish Defense Forces team that participated in the trial purchased sounding services from Vaisala, the Finnish supplier of weather measurement instruments. Project Manager Päivi Peltoniemi and Development Manager Sakari Kajosaari of



A PzH2000 howitzer at the test firing site in Denmark.

Vaisala were responsible for the weather services. A representative of the military, Senior Lieutenant Reijo Miettinen of the Meteorological Platoon of the Finnish Defense Forces, was appointed to lead the Finnish department at the trial. Although the weather services functioned without any problems during the rehearsal, there was a lot of gazing up into the air - constantly following the flight of a sounding balloon. Finland's team carried out eight soundings daily, some at an interval of one hour, which kept the team busy throughout.

Conclusions

The test firing proceeded well and the working groups obtained a lot of data from the tests. However, final analyses and conclusions based on the test results will be ready only in April - May 2004. The new findings may turn out to be useful in improving the accuracy of artillery and mortar systems while at the same time reducing the frequency of soundings. This, in turn, can help in minimizing the need for maintenance. ●



With Danish colleagues looking on, Lieutenant Reijo Miettinen sends a weather balloon in a competition to see which team can reach the highest altitude with its sounding balloon. Finland swept the competition (3-0).