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Military:

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Letter Report for Multiple Launch Rocket System (MLRS) M270 Launcher Solar Radiation Test

Test Data Results Provided by:

Climatic Test Branch
Environmental Test Division
Redstone Technical Test Center

CSTE-DTC-RT-M-CL
8 Oct 99

W. Byam 6-0591

1. Solar radiation tests were conducted by Climatic Test Branch (CTB) at Building 7290 from September 29, to October 6, 1999. These tests were conducted to determine the effectiveness of a paint additive applied to the cab section of the launcher. Mr. Steve Bramlett, MLRS Project Office, requested the tests.

2. High cab temperatures have been experienced during days with bright sunlight or high solar irradiance; the cab is not air-conditioned. The paint additive, Insuladd, has been proposed by a local vendor to lower cab temperatures. This paint additive increases the resistance to heat transfer on the surface its applied to; the improvement being primarily to reduce the effects of radiant energy.

Multiple Launch Rocket System (MLRS)

3. The launcher is too large for this chamber to conduct a standard MIL-STD-810 solar radiation test. However the objective was to determine the effectiveness of the paint additive on the cab area. To accomplish the objective two launchers were subjected to identical solar loading over a two day period. Launcher, S/N 4AA00481, had been painted using Insuladd and launcher, S/N 4AA00222, was not.

Note: The irradiance level in the solar chamber is normally varied by raising and lowering the light bank. This was not possible because of the height of the launcher. With the light bank at its highest point, the lights were only 30 inches above the cab!



M270 Launcher Solar Radiation Test

4. For the first day the launchers were in the operational configuration with the blast shields in place and were exposed to a MIL-STD-810 daily solar radiation cycle. On the second day the blast shields were lowered and windows opened and the launchers were exposed to three hours of maximum solar radiation. Thermocouples were placed on the outside and inside of the cab in various locations, see enclosed photographs. The enclosed plots are arranged to compare the temperatures during the test at the following locations:

- Commanders side overhead
- Drivers side overhead
- Air in the cab

5. At every location monitored the cab painted with Insuladd had lower temperatures during the test. On the first day temperatures in the cab peaked at 131.7 F in the launcher with the paint additive and 137.8 F for the other launcher. On the second day the cab temperature peaked at 97.7 F and 100.5 F.

End of Report

These last temperatures reflect the fact that the air temperature outside and inside the cab was almost the same due to the fact that the blast shields were lowered and the windows were open.

SUMMARY: The launchers almost completely filled the solar chambers. It is believed that much more dramatic results would show from the use of Insuladd if the chamber was larger or if the tests was conducted in a natural outdoor environment.

If Insuladd works this well in a dark colored paint in an extremely hostile environment just imagine how well it works with lighter colored paints and in a more normal environment!