

## APPENDIX J

### WEATHER EFFECTS ON MECHANIZED INFANTRY

Mechanized infantry operations are also influenced by those weather elements that degrade trafficability and visibility. Indeed, the weather effects impacting mechanized infantry units will include most of the conditions that play a role in both armor and regular infantry. Although the effect may be more pronounced for mechanized infantry, armor, and cavalry operations, weather elements have generally similar impacts on other units. Listed below are weather effects for mechanized infantry that are not contained in the WTDA tables.

**CLOUDS AND SKY COVER.** Low overcast clouds will limit the effectiveness of aerial illumination devices. Overcast clouds tend to limit heating of inactive targets and, therefore, lower target detection range for thermal sights. NVD are limited by clouds blocking natural light from the moon and stars. CAS and aerial resupply missions are hindered by low clouds.

**HUMIDITY.** When coupled with high temperatures, humidity decreases effectiveness of crews in closed vehicles.

**ILLUMINATION.** NVD require about a quarter (23 degrees) of the moon, 30 degrees above the horizon, scattered clouds, and the sun more than 5 degrees below the horizon. Detailed products dealing with the use of E-O devices are discussed in Appendix F.

**PRECIPITATION.** Rain and snow degrade trafficability, limit visibility, and degrade the effectiveness of certain target acquisition and NVD.

**STATE-OF-THE-GROUND.** Wet grounds play an important role in the effectiveness of chemical agents and smoke munitions. They can also affect trafficability and movement rates. Frozen ground improves mobility and significantly increases time available for preparing fighting positions. Deep snow slows movement of tracked vehicles. Frozen ground affects systems such as mines, sensors, and indirect fire.

**SURFACE WIND.** Trajectory data and first round hit capability are degraded by high crosswinds. Wind, or in some cases the lack of it, affects smoke and indirect fire illumination missions and increases the number of indirect fire rounds used.

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**TEMPERATURE.** Too cold or too hot conditions dictate the type of lubricants to be used, engine warm-up periods, and sustained rate of fire for weapons. High temperatures decrease the time personnel can remain in vehicles. Extremely high temperatures increase water consumption. Low temperatures degrade the ballistics of main guns. Extreme low temperatures reduce personnel effectiveness, and decrease the availability of water because of freezing. Temperatures changing from above to below freezing can freeze stationary tracks into the mud. High temperatures cause gun tube "droop," shimmering, mirages, and vehicle exteriors to be too hot to touch.

**VISIBILITY.** Poor visibility affects visual, laser range finding, and target acquisition systems. Poor visibility increases the survivability of infantry units.

**WINDCHILL.** See Appendix L.



**Table J-2. Weather effects from reduced visibility.**

WEATHER VALUE (METERS)	SEVERE DEGRADATION		MODERATE DEGRADATION	
	SYSTEM/EVENT	REMARKS	SYSTEM/EVENT	REMARKS
LT 200	FO		LAW NVG (PVS-5) Infrared aiming light (PAQ-4)	
LT 400			84-mm recoilless rifle (AT-4) NVS (PVS-2)	
LT 500	DRAGON		VIPER FO	
LT 600			NVS (PVS-4)	
LT 800	Tracked vehicle, day operation			
LT 1,000	TOW		DRAGON DRAGON thermal sight (TAS-5) M-60 machine gun 7.62-mm coaxial machine gun	
LT 1,200			NVS (TVS-2 and TVS-5)	
LT 1,600	CAS	See app E	Tracked vehicle, day operation .50-cal machine gun	
LT 2,000			NVS (TVS-4)	
LT 3,200			25-mm chain gun M-60, M-1 main gun TOW thermal sight (UAS-12) Handheld thermal viewer (PAS-7) Thermal night observation device (UAS-11) CAS	
LT 4,500			81-mm mortar	
LT 5,000			107-mm mortar (4.2 in)	



Table J-4. Weather effects from temperature.

WEATHER VALUE (°F/°C)	SEVERE DEGRADATION		MODERATE DEGRADATION	
	SYSTEM/EVENT	REMARKS	SYSTEM/EVENT	REMARKS
LT -25/-32	TOW DRAGON Rocket launcher (M202A1) Handheld thermal viewer (PAS-7) Dry cell battery Personnel	Only 20% effective	Generators Laser infrared observation set (GVS-5) INF/CFV (M2/M3)	wo arctic kit wo external power wo winter kit
LT -20/-28			NVS (PVS-4 and TVS-5) Maintenance Tanks (M-1, M-60)	wo low temp adapter Takes 5 times longer Accuracy
LT 0/-18			Wheeled vehicles Dry cell battery	wo winter kit Only 40% effective
LT 20/-6			Thermal night observation device (UAS-11) Platoon early warning system (TRS-2) DRAGON	wo arctic kit wo BA3090 battery wo low temp adapter
LT 32/0			NVG (PVS-5) Personnel Small arms and machine guns	wo arctic kit See app L for wind-chill Reduces effectiveness
GT 85/29			Personnel	See app L
GT 95/35	Personnel	See app L	Dry cell battery	Will not hold charge
GT 125/52	All NVS 81-mm mortar Generators 90-mm recoilless rifle Laser infrared observing set (GVS-5) WP rounds	Ammunition Storage, use		

Table J-5. Weather effects from precipitation.

WEATHER CONDITION	SEVERE DEGRADATION		MODERATE DEGRADATION	
	SYSTEM/EVENT	REMARKS	SYSTEM/EVENT	REMARKS
Light rain or snow			Mortars Wheeled vehicles	Sight glass fogs
Moderate rain or snow	Wheeled vehicles		LOS communications Personnel movement Target acquisition Platoon warning system (TRS-2) GSR Acoustic systems Equipment storage	
Heavy rain or snow	Mortars Personnel movement LOS communications Target acquisition Laser systems			
Thunder- storm/ lightning			Ammunition Refueling Communications Equipment storage	Safety Safety Interference
Light freezing rain			Personnel Wheeled vehicles	
Moderate freezing rain	Personnel Wheeled vehicles			
<b>SNOW DEPTH (INCHES)</b>				
GT 3			Personnel movement	
GT 6	Personnel movement		20-mm and 40-mm ammunition	
GT 12	Wheeled vehicles			
GT 20			Tracked vehicles	
GT 30	Tracked vehicles			