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FOR DOCTRINE DEVELOPMENT AND EDUCATION



ANNEX 3-59 WEATHER OPERATIONS

WEATHER PRINCIPLES

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Accuracy

Air Force [weather](#) operations provide weather information to the [commander, Air Force forces](#) (COMAFFOR), to allow commanders to exploit environmental factors and mitigate weather effects from planning through mission execution. Gaps in weather sensor coverage, limitations on the accuracy of weather observing systems and prediction models, and the complexity of atmospheric processes can all reduce accuracy. The Air Force weather community constantly strives to overcome or mitigate these impediments. The supported community, including operators, should assist weather personnel by actively providing feedback and first-hand observations regarding the latest mission area weather conditions. For instance, post-strike inflight reports and post-mission debriefing should include target area and other relevant weather information. Pilot reports, imagery, and ground observations allow the weather community to improve the accuracy of weather and weather effects information for follow-on missions.

Consistency

Air Force weather operations should provide consistent weather and weather effects information to forces at all levels/echelons, resulting in “one operation, one forecast.” To achieve this result, weather personnel should derive products from the same basic data from designated characterization sources to ensure consistent weather exploitation products. Weather information provided to decision-makers and other end users should, therefore, be spatially and temporally consistent across the operational environment as appropriate and provide a common operating environmental picture. The coordination and collaboration on an integrated, predictive weather product is required when multiple military units are operating in the same geographic area (e.g., the same airfield, air refueling routes, military operating areas, or drop zones). Coordinated weather operations ensure commanders at every level receive consistent weather information.

Timeliness

Weather information is perishable; therefore, it should be derived from the latest available data, disseminated quickly, and integrated at the appropriate time into the planning and execution of military operations. Air Force weather operations should also be vigilant and responsive, informing commanders of potential weather effects on proposed and ongoing military operations in a timely manner.

A significant aspect of timeliness is how weather information is disseminated to the warfighter. A net-centric data repository, using machine-to-machine dissemination,

improves the chances that critical weather information and its impact on operations will reach decision-makers in time to capitalize on time-sensitive opportunities. For instance, real-time information sent to an aircraft (such as images of targets affected by the weather and accounting for particular targeting sensors) enhances situational awareness for newly received time-sensitive targets. Similarly, [space situational awareness](#)¹ (SSA) requires timely integration of accurate and relevant space weather information into military space operations to help protect friendly forces, characterize space system anomalies, differentiate between intentional and unintentional interference, and exploit adversary vulnerabilities. Weather entities and decision-makers should maintain communication with one another to support and sustain the timely dissemination of weather information.

Relevancy

Weather information should be relevant for it to provide benefit to military operations. Air Force weather personnel ensure decision-makers receive information on weather parameters that have the potential to degrade or enhance any mission prior to mission execution. Commanders, in turn, should assess the expected performance of their assets in light of weather effects to determine the proper combination of delivery systems, munitions, platforms, and other resources to attain desired effects. Air Force weather operations are most relevant when integrated from the beginning of the operational planning process. Weather information applies directly to planning, executing, assessing, and sustaining operations.

Air Force weather personnel should cultivate a two-way flow of information, in which operators provide relevant mission data that can be used to enhance the applicability of weather information to operations. Weather personnel should consider the strengths, limitations, and time factors associated with specific air, space, maritime, land, and special operations missions they are supporting and tailor weather products accordingly, based on the mission requirements. For instance, weather that could negatively affect air refueling operations, such as excessive turbulence and cloud cover above 18,000 feet, may not appear to be relevant to Army helicopters operating below 500 feet, but could affect other platforms supporting the same mission objective. Thus, weather personnel processing a detailed understanding of operations and mission profiles can ensure that weather information is relevant.

¹ SSA is defined as “cognizance of the requisite current and predictive knowledge of the space environment and the operational environment upon which space operations depend” (JP 3-14 [Space Operations](#)).