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**Statistical Short-Range Guidance for Peak Wind Speed Forecasts at
Edwards Air Force Base, CA**

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The peak winds near the surface are an important forecast element for Space Shuttle landings. As defined in the Shuttle Flight Rules (FRs), there are peak wind thresholds that cannot be exceeded in order to ensure the safety of the shuttle during landing operations. The National Weather Service Spaceflight Meteorology Group (SMG) is responsible for weather forecasts for all shuttle landings. They indicate peak winds are a challenging parameter to forecast. To alleviate the difficulty in making such wind forecasts, the Applied Meteorology Unit (AMU) developed a personal computer based graphical user interface (GUI) for displaying peak wind climatology and probabilities of exceeding peak-wind thresholds for the Shuttle Landing Facility (SLF) at Kennedy Space Center. However, the shuttle must land at Edwards Air Force Base (EAFB) in southern California when weather conditions at Kennedy Space Center in Florida are not acceptable, so SMG forecasters requested that a similar tool be developed for EAFB.

Marshall Space Flight Center (MSFC) personnel archived and performed quality control of 2-minute average and 10-minute peak wind speeds at each tower adjacent to the main runway at EAFB from 1997-2004. They calculated wind climatologies and probabilities of average peak wind occurrence based on the average speed. The climatologies were calculated for each tower and month, and were stratified by hour, direction, and direction/hour. For the probabilities of peak wind occurrence, MSFC calculated empirical and modeled probabilities of meeting or exceeding specific 10-minute peak wind speeds using probability density functions. The AMU obtained and reformatted the data into Microsoft Excel PivotTables, which allows users to display different values with point-click-drag techniques. The GUI was then created from the PivotTables using Visual Basic for Applications code. The GUI is run through a macro within Microsoft Excel and allows forecasters to quickly display and interpret peak wind climatology and likelihoods in a fast-paced operational environment. A summary of how the peak wind climatologies and probabilities were created and an overview of the GUI will be presented.

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14. ABSTRACT The abstract describes work done by the Applied Meteorology Unit (AMU) to develop a graphical user interface (GUI) for displaying peak wind climatology and probabilities of exceeding peak-wind thresholds for Edwards Air Force Base (EAFB). Marshall Space Flight Center (MSFC) personnel archived and performed quality control of 2-minute average and 10-minute peak wind speeds at each tower adjacent to the main runway at EAFB from 1997-2004. They calculated wind climatologies and probabilities of average peak wind occurrence based on the average speed. The climatologies were calculated for each tower and month, and were stratified by hour, direction, and direction/hour. For the probabilities of peak wind occurrence, MSFC calculated empirical and modeled probabilities of meeting or exceeding specific 10-minute peak wind speeds using probability density functions. The AMU obtained and reformatted the data into Microsoft Excel PivotTables, which allows users to display different values with point-click-drag techniques. The GUI was then created from the PivotTables using Visual Basic for Applications code. The GUI is run through a macro within Microsoft Excel and allows forecasters to quickly display and interpret peak wind climatology and likelihoods in a fast-paced operational environment.					
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