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ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)							DATE February 2000		
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development				PE NUMBER AND TITLE 0604726A Integrated Meteorological System (IMETS) (TIARA)				PROJECT DD85	
COST (In Thousands)	FY1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	Cost to Complete	Total Cost
DD85 Integrated Meteorological System (IMETS)	1901	2301	1771	1903	3412	3368	3365	Continuing	Continuing
<p>A. Mission Description: It is essential to provide the battlefield commander at all echelons with accurate, high resolution, near real time weather data in order to conduct intelligence preparation of the battlefield (IPB). This program element, Integrated Meteorological System (IMETS), funds the development of evolving upgrades to the fielded system. The IMETS is a mobile tactical automated weather data receiving, processing, and dissemination system designed to provide timely weather and environmental effects, forecasts, observations, and decision aid support to the Army. The IMETS is an Army-furnished system, which is operated by Air Force weather personnel and maintained within Army support channels. IMETS provides weather information overlays for the Common Tactical Picture, meteorological (met) messages and other tailored products. IMETS provides all Army Battle Command System (ABCS) systems, mission planning and situation awareness with direct client access to the IMETS 4-D (position and time) meteorological database and to the database of weather impacts on friendly and threat systems. IMETS consists of three basic configurations. These configurations enable support for the full range of military operations from large Major Regional Conflicts to small task forces supporting Military Operations Other Than War: 1) command post (CP) configuration for a fixed facilities at echelon above corps (EAC) level where the CP needs the IMETS permanently integrated into the local area network and a tactical IMETS is not required; 2) vehicle-mounted configuration for tactical operations where the supported echelon moves frequently; and c) light configuration for task-organized elements of a supported echelon, integrated into a small task force, where lightweight, easily deployed core weather functions can be performed without its own vehicle to shelter the system.</p> <p>FY 1999 Accomplishments:</p> <ul style="list-style-type: none"> • 864 Continued to investigate, develop, test and apply advanced software and hardware processing, storage, display and input/output (I/O) technologies to tech base prototypes of high performance expanded weather applications capabilities. This included extending the time domain in battlescale forecast modeling and initial integration of AF and Navy forecast data; evaluated the DoD Meteorological Satellite Program Special Sensor Data, environmental record data, for integration into the Weather Effects database; generated a Down Wind Message from IMETS; adapted the AF Electro Optical Tactical Decision Aid (EOTDA) and Army Target Acquisition Model (TARGAC) to run with IMETS weather data; investigated applications to support Aviation Mission Planning; developed a heat/cold tactical decision aid; certified DII/COE level 5 compliance for UNIX operating system; and began preliminary investigation of laptop configurations for future dismounted IMETS weather effects workstations. Implemented IMETS weather effects workstation software application changes required to provide Y2K compliance. Developed initial capabilities for ingest of Air Force MMS data using GRIB and BUFR World Meteorological Data standard formats. Integrated IMETS ingest of met data by Air Force Tactical satellite (TVSAT) communications. Developed IWEDA weather impact overlays for the Common Tactical Picture. • 658 Continued to evaluate, configure and integrate tech base prototype capabilities into operational IMETS. • 200 Continued test and evaluation support for ABCS digitization products. • 179 Additional funding provided for Y2K compliance. <p>Total 1901</p>									
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<p>FY 2000 Planned Program:</p> <ul style="list-style-type: none"> • 312 Integrate IMETS applications to ABCS 6.0 foundation software, including weather overlays, weather overlay provider, Joint Mapping Tool Kit map services; and deliver to CTSF for implementation in First Digitized Division. Participate in demonstrations and AWE exercises such as the Division Capstone Exercise and JCF-AWE. Begin conversion of IMETS Weather Effects Workstation applications to a dismounted laptop version (UNIX and PC/NT). Provide weather and impact information on the ABCS Synchronization Matrix, and weather symbol information/warnings on the Common Tactical Picture (CTP). • 567 Extend the IMETS weather forecast and decision aid capability from 24 to 96 hr at 36 km resolution. Produce a fast analysis version of the Battlescale Forecast Model (BFM) to produce short range (3 hr) forecasts over small user-defined Areas of Interest. Improve the BFM forecast output time resolution to one hour. Begin development of a common Atmospheric Sounding Program (ASP) to consistently post-process both BFM and MM5 data into weather hazards and features. Extend the IMETS Gridded Meteorological Database (GMDB) to incorporate multiple numerical weather prediction model data (MM5, BFM and 1 deg NOGAPS), including their different data grid definitions and geographic coordinate projections. Develop an initial version of the GMDB that can be hosted on the DTSS terrain data server, and develop special subsets of meteorological data and products that will reside on the Joint Common Data Base (JCDB). • 250 Interface the first release of tri-service Target Acquisition Weather Software – Army (TAWS-A) to the GMDB and IMETS. Develop a cold stress TDA for the Integrated Weather Effects Decision Aid (IWEDA). Develop a JAVA client version of IWEDA and evaluate as a prototype for platform independent IMETS applications. Investigate constraints on acoustic propagation TDA application prototypes for IMETS. Improve the Vis5D visualization to support the new GMDB data sets. Develop meteograms and other new contour displays. Develop IMETS products and parameters to support Aviation Mission Planning and data visualization from the GMDB met data. Develop initial meteorological satellite remote sensing products for IMETS using the Air Force Small Tactical Terminal or other sources of multi-band met satellite imagery, and special sounder data; and configure to IMETS satellite data registration, calibration and display. • 210 Purchase six IMETS Light test articles at \$35K each • 150 Continue to develop IMETS interoperability with other BFA systems, including MCS, ASAS, AFATDS, CSSCS and AMDWS. • 550 Continue to evaluate, configure and integrate tech base prototype capabilities into operational IMETS. • 200 Continue test and evaluation support for ABCS digitization products. • 62 Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR) <p>Total 2301</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 250 Integrate IMETS applications to ABCS 7.0 foundation software. Complete conversion of IMETS data ingest, weather forecast, weather impact applications, graphical user interface, 2-D and 3-D data visualizations to execute on a dismounted laptop configuration. Certify DII/COE level 5 compliance for the laptop configuration. 		
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FY 2001 Planned Program: (continued)

- 539 Extend the IMETS nested BFM and MM5 forecasts to 120 hours. Extend the IMETS Gridded Meteorological Database (GMDB) to incorporate latest METOC standards for common environmental data across services. Complete development of a common Atmospheric Sounding Program (ASP) to consistently post-process both BFM and MM5 data into weather hazards and features. Continue to develop a GMDB that can be hosted on the DTSS terrain data server for distributing IMETS gridded meteorological data and weather impacts database information to ABCS clients at lower echelons where there is no full IMETS capability. Continue to develop special subsets of meteorological data and products that will reside on the Joint Common Data Base (JCDB), to include hosting the GMDB on the JCDB. Integrate physics-based TAWS-A and rule-based IWEDA decision aids into an Army Tactical Decision Aid (ATDA) on IMETS. Integrate an acoustic propagation decision aid into the ATDA. Integrate additional polar and geostationary meteorological satellite remote sensing data analysis into IMETS to provide surface state, precipitation, snow cover and other weather parameters of interest.
- 150 Develop IMETS interoperability with other BFA systems, including MCS, ASAS, AFATDS, CSSCS and AMDWS.
- 382 Continue to evaluate, configure and integrate tech base prototype capabilities into operational IMETS.
- 200 Continue test and evaluation support for ABCS.
- 250 Implement a capability for IMETS to participate with both live and synthetic weather scenarios in live, virtual and constructive simulation exercises leading to First Digitized Corps. Develop a capability to ingest climatological and synthetic weather scenarios into IMETS for play in exercises. Interface to Air Force Combat Climatology Center and NCAR historical weather databases. Integrate to M&S through a C4I to HLA interface to allow the IMETS data to be used to support simulations and existing M&S weather servers.

Total 1771

B. Program Change Summary	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (FY 2000/2001 PB)	1777	2318	1782
Appropriated Value	1790	2318	
Adjustments to Appropriated Value			
a. Congressional General Reductions	-13		
b. SBIR / STTR	-47		
c. Omnibus or Other Above Threshold Reduction	+179	-9	
d. Below Threshold Reprogramming			
e. Rescissions	-8	-8	
Adjustments to Budget Years Since FY 2000/2001 PB			-11
Current Budget Submit (FY 2001 PB)	1901	2301	1771

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Change Summary Explanation: Funding - FY99 (+179): Additional funding provided for Y2K compliance.

C. Other Program Funding Summary	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	To <u>Compl</u>	Total <u>Cost</u>
OPA 2 - SSN: BW0021-IMETS	4832	5444	7018	2511	7213	8679	8469	0	44192

D. Acquisition Strategy: The IMETS development program integrates efforts from the Air Force, Army, and OSD's DII COE. It is consistent with the development of the C4I Joint Technical Architecture-Army. The IMETS Non Developmental Item acquisition strategy has proven successful in the fielding of twenty systems since program initiation in FY 1992. This development strategy will be continued to include software modules as they mature and become part of the COE library. A common map server update is of primary focus along with increased user interoperability. Current improvement efforts are to incorporate new numerical weather prediction forecasts and products communicated from centralized Air Force Hubs to the individual IMETS and its Battlescale Forecast Model in the field. Weather tactical decision aid upgrades and updated forecaster aids are developed to include products from Air Force initiatives such as the New Tactical Forecast System and Small Tactical Terminal for high resolution domestic and foreign weather satellite data. IMETS data and applications will be accessible to Battlefield Functional Area C4I systems as clients through weather database services with the Combat Terrain Information System (CTIS) Digital Topographic Support System (DTSS) environmental database and through the Joint Common Data Base. Application modules from the Army Research Laboratory will be integrated and fielded as an upgrade to the current software baseline. These include: improvements in generation and display of higher time resolution and higher spatially resolved weather forecast and effects information; inclusion of physics-based weather decision aids and models; development of more versatile weather databases that support a variety of service and allied weather forecast models and environmental databases; development of weather applications consistent with joint METOC data standards; development of weather remote-sensing products from meteorological satellites; and ingest of battlefield sensor data to augment initializing mesoscale forecasts.

E. Schedule Profile	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>
Extend Battlescale Forecast Model (BFM) and Air Force MM5 forecast data resolutions	2-4Q	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q
Develop/Integrate Visualization 5D program	3-4Q	3-4Q	3-4Q				
Develop Thunderstorm and turbulence model	2-4Q						
Develop common BFM and MM5 Atmospheric Sounding post processor		1-4Q	1-4Q				
Develop Gridded Met Database on DTSS terrain server and support Joint Common Database products		1-4Q	1-4Q				
AF Weather Effects re-engineering integration	1-4Q	1-4Q					
Convert weather effects apps to other platforms		1-4Q	1-4Q	1-4Q	1-4Q	1-4Q	

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E. Schedule Profile	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	
Integrated Weather Effects Decision Aid update (client and laptop integration)	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q	
DII/COE Level 6 compliance	2-4Q	1-4Q						
Integrate DMSP Environmental Data Record and other remote sensing products	2-4Q	1Q	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q	
Develop application for Aviation Mission Planning	2-4Q	1-4Q						
Develop heat/cold tactical decision aid	2Q	1-2Q						
Develop TAWS-A and ATDA decision aids		1-4Q	1-4Q	1-4Q				
Support ABCS/IMETS integration effort	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q	1-4Q	

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ARMY RDT&E COST ANALYSIS (R-3)	DATE February 2000
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I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Product Integration	CPAF Task Order	Logicon RDA Tacoma, WA	9420	546	1Q99	462	1Q 00	401	1Q 01	2703	13532	
b. Weather Application	MIPR	ARL, White Sands Missile Range, NM	1437	608	1Q99	790	1Q00	770	1Q01	8898	12503	
c. GFE	MIPR	PEO C3S Ft. Monmouth, NJ				287	1Q 00				287	
d. Y2K Plus Up	MIPR	CECOM		171	3Q						171	
e. Inflation Withhold				8							8	
f. SIBR/STTR		HQ DA		47		62					109	
Subtotal Product Development:			10857	1380		1601		1171		11601	26610	

Remark: The target value of the contract is based on the total contract with task orders written against it. There is no target value associated with each task order.

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Documentation Coordination	MIPR	CECOM	200	200	2Q99	300	2Q 00	200	2Q 01	2702	3602	
b. Program Office	MIPR	PMO Intel Fusion McLean, VA	571	121	1Q99	200	1Q 00	200	1Q 01	2477	3569	
Subtotal Support Costs:			771	321		500		400		5179	7171	

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 1999 Cost	FY 1999 Award Date	FY 2000 Cost	FY 2000 Award Date	FY 2001 Cost	FY 2001 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. ABCS	MIPR	ARL, White Sands Missile Range, NM	200	200	1Q99	200	1Q 00	200	1Q 01	3376	4176	
Subtotal Test and Evaluation:			200	200		200		200		3376	4176	

Remark: No target value associated with the MIPR.

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V. Management Services: None.

			Total PYs Cost	FY 1999 Cost		FY 2000 Cost		FY 2001 Cost		Cost To Complete	Total Cost
Project Total Cost:			11828	1901		2301		1771		20156	37957