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SEP 30 2010

MEMORANDUM FOR: Directors, NWS Headquarters Offices
Directors, NWS Regions
David B. Caldwell
FROM: David Caldwell
Director, Office of Climate, Water, and
Weather Services
SUBJECT: FY 2011 Implementation Plan for National
Weather Service (NWS) Training and Education

Attached is the FY 2011 Implementation Plan for NWS Training and Education (IP11).

I thank everyone involved for the collaborative effort that has produced an exceptional training plan.

Attachment



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**Fiscal Year 2011
IMPLEMENTATION PLAN FOR
NATIONAL WEATHER SERVICE TRAINING AND EDUCATION**

**In Support of
NOAA and National Weather Service Human Capital Strategic Plans and Goals
(09/27/10)**

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1. Introduction

This Implementation Plan (IP11) is the guiding document for the national training and education activities within the [National Oceanic and Atmospheric Administration's \(NOAA's\) National Weather Service \(NWS\)](#) for Fiscal Year 2011 (referred to as FY11 herein). The purpose of this plan is to specify the expected national training activities necessary to support the wide range of mission critical operations. It will be coordinated and executed by the [Office of Climate, Water, and Weather Services \(OCWWS\), Training Division](#) (TD) for FY11. It includes detailed resource cost analyses including allocations for Division full-time equivalent (FTE) time and course dollar costs, as well as the unfunded training gap requirements.

The FY11 budget of \$11.5 million (M) funded 85 of 158 (54%) National Strategic Training and Education Plan (NSTEP) process derived requirements. The process facilitates both mandated requirements and the highest priority training needs identified. Funding was based on either assumed FY 2010 (FY10) level funding or anticipated program changes in the FY11 President's proposed budget.

The demand for training in science and technology and to support Decision Support Services is increasing. Without such training, maintaining a highly trained, professional workforce in the NWS that performs at the required levels to protect life and property will be compromised. Vital training needs are constantly being identified. Program funds only partially mitigate some impacts of continued level Base funding by supporting specific needs for systems such as the Advanced Weather Interactive Processing System (AWIPS), Dual-Polarization (Dual-Pol) radar, Next Generation Weather Radar (NEXRAD), the Automated Surface Observing System (ASOS), Advanced Hydrologic Prediction System (AHPS), Fire Weather, Geostationary Operational Environmental Satellite-R Series (GOES-R+), Weather Radio Improvement Program (WRIP), and the Radiosonde Replacement System (RRS).

In August 2010, the NWS Assistant Administrator (AA) / Chief Financial Officer (CFO) provided an additional \$100,000 (\$100K) to the Training Division Base FY10 budget, and committed to providing \$2M in FY11 to augment Base funds. The AA/CFO funds helps maintain a critical level of training for FY11 for field staff and allows us to move forward in providing training for Human Factors, Societal Impact, and Seasonal Readiness Assessment in support of Impact based Decision Support Services and Services 2020.

2. Plan Assumptions

This IP11 assumes the following funding levels:

1. OCWWS base non-labor funding continues to be level funded from FY10 - \$5,119K.
2. The Office of Science and Technology (OST) AWIPS Program Office will fully fund AWIPS II activities. This requires \$1,904K in Operations and Maintenance (O&M) funds and \$157K in Procurement, Acquisitions and Construction (PAC) funds. If the AWIPS II deployment schedule were to change, funds would be reallocated from AWIPS

II deployment training to teach AWIPS I attrition courses (e.g., AWIPS I System Administration) and others, as needed.

3. OST Dual-Pol funding only provides for NWS Training Center Maintenance Training of \$239K.
4. Office of Operational Systems (OOS) NEXRAD non-labor funding is reduced by \$300K from FY10 (\$1,289.2K) to an FY11 estimate of \$989K.
5. OOS continues to provide ASOS, RRS and WRIP funding to fund maintenance courses in those areas.
6. AA/CFO provides \$2M and are annotated as "AA" as the funding source in the IP tables. This funds the shortfalls in Base, NEXRAD and Dual-Pol training and begins work on Human Factors, Societal Impacts and Seasonal Readiness Training.

3. Appendices

Appendices 1 through 4 spell out the training deliverables to be accomplished in FY11. These deliverables are delineated by the TD Branch and the Cooperative Program for Operational Meteorology, Education and Training (COMET) which are responsible for coordinating each training activity. References to the appropriate funding tables are also cited, and additional information on many of the activities funded in FY11 can be referenced from hyperlinks (as denoted in blue, underlined text) in the tables. Appendix 5 denotes major training activities planned in FY12. Appendix 6 provides details on the NSTEP process used to prepare training requirements, set priorities and allocate resources to develop IP11.

Appendix 1: OCWWS Training Division (OS6) Managed Funding– Table 1

I. TD Infrastructure Items

- Administrative Budgets for TD Branches (NWS Headquarters, NWS Training Center (NWSTC), Forecast Decision Training Branch (FDTB), and Warning Decision Training Branch (WDTB)): Provides day-to-day operating funds.
- [American Meteorological Society \(AMS\)](#) Journal Access: TD annually pays for NWS electronic access to three AMS online journals: [Monthly Weather Review](#), [Weather and Forecasting](#), and [Weather, Climate, and Society](#).
- NWS Learning Management System (LMS) Charges: TD pays for the [NWS LEARN Center](#) on the [Department of Commerce Learning Center \(CLC\)](#) in addition to partially redirecting the work of two TD instructors. Funds are set aside for system administration support Cooperative Institute for Mesoscale Meteorological Studies (CIMMS) staff at WDTB and NWSTC to support LMS-related activities. An annual charge to transfer data between the LMS and COMET's Meteorology and Education ([MetEd](#)) website is also funded.
- Telecommunications Charges: Pays for Division conference call costs including telephone conferencing numbers and GoToMeeting Licenses to support field coordination and training webinars.
- Annual NSTEP and Heads of Training Group (HOTG) Meetings Travel Funds: Set aside for annual NSTEP meetings and HOTG meetings.
- International Weather and Water Leadership: TD is routinely requested, by the NWS [International Activities Office](#), to support visiting foreign delegations. In preparation, funding and/or FTE resources are set aside at NWSTC, FDTB and WDTB for rapid response.

II. TD-Managed Funds

- Incident Meteorologist (IMET) Workshop: NWS policy mandates that IMETs receive yearly training to fulfill their duties in the NWS and within NOAA. This is an annual workshop hosted in Boise, ID by the [OCWWS Fire and Public Weather Services Branch](#).
- River Forecast Center (RFC) Workshop: Coordinated by the [OCWWS Hydrologic Services Division](#), funds training for RFC staff on operational tools and techniques.
- Regional Training Funds: Funds are allocated directly to the Regions for use in meeting unique training requirements in mission-critical areas such as Information Technology (IT) and project management.
- Service Assessment Actions TBD: Funds are reserved for future training actions as a result of national Service Assessments, which are conducted after major, high-impact weather events each year.

Appendix 2: [NWS Training Center](#) – Table 2

I. In-Residence Training – See Tables 2 and 6 for detailed information on existing residence courses. The following are notable courses being hosted by the NWSTC in FY11.

- AWIPS:
 - AWIPS II Operational Test & Evaluation (OT&E) System Administration (SA): Provides AWIPS II OT&E SA support training prior to the beginning of AWIPS II Field OT&E. This training will be provided to two people per site (typically the Electronic Systems Analyst (ESA) and the Information Technology Officer (ITO)) for 22 designated beta test sites. These offerings will be taught by instructors from Raytheon, the AWIPS II contractor.
 - AWIPS II System Administration Deployment: Training will be provided for two people per site for all sites not part of the OT&E training.

- Maintenance
 - [ASOS Maintenance](#)

 - WRIP Maintenance
 - WRIP Focal Point Deployment
Note: WRIP is providing funding in FY11 to upgrade NWSTC equipment and pay for initial training costs. This funding will be spread over two years – FY11 and FY12, with supplemental Base funding.

 - [NOAA Weather Radio \(NWR\) Armstrong Transmitter Maintenance](#)
 - [NWR Crown Transmitter Maintenance](#)
 - [NWS Doppler Weather Radar \(WSR-88D\) Maintenance](#)
 - [WSR-88D Open Systems Radar Data Acquisition \(ORDA\) Maintenance](#)
 - [Radiosonde Replacement System \(RRS\) Maintenance](#): Training will be offered in support of RRS deployments (funded by the RRS Program), as well as attrition training (funded by NSTEP).
 - [NWR Nautel Transmitter Maintenance](#)

- Hydrology
 - [Advanced Hydrologic Applications](#)
 - [Weather Forecast Office \(WFO\) Hydrology Program Management](#)
 - [Warning Coordination Meteorologist \(WCM\) / Service Coordination Hydrologist \(SCH\) Course](#): Offered in FY11 as part of the biannual rotation with COMET's Mesoscale Analysis and Prediction (COMAP) course.

- IT:
 - [Linux Administration for WFOs/RFCs](#)

- Management and Leadership - [Leadership Academy](#):
 - [Management and Supervision](#): Supervisors (staff who perform employee rating reviews) will have preference for course slots over non-supervisory management team members.
 - [Field Operations Management](#): Open to Bargaining Unit employees.
 - [NWS Headquarters Operations Management Course](#): NWSTC instructors will provide in-residence training to NWS Headquarters personnel in Silver Spring, MD patterned after the highly successful Field Operations Management course.
- Human Factors Training: Training for lead forecasters on addressing human factors in NWS operations will be developed and offered.
- Meteorology:
 - [Cooperative Network Operations](#)
 - [Data Acquisition Operations](#)
 - [WCM / SCH Course](#): Offered in FY11 as part of the biannual rotation with COMET's COMAP course.

II. Distance Learning Training Activities:

- AWIPS:
 - AWIPS II Focal Point Deployment (WDTB assists): Produce distance learning (DL) training modules covering AWIPS II baseline application configuration, localization and templates.
 - AWIPS II Local Applications Development: Continues the development and delivery of Local Application modules and updating of previous modules as AWIPS II is released.
 - AWIPS II Enhancements Training: Addresses enhancements with the initial deployment of AWIPS II.
 - AWIPS II Variance Training (WDTB and FDTB assists): Develop and deliver DL modules as necessary to address identified variances in the user interface as AWIPS I is updated to AWIPS II.
 - Field Requirements Teams (FRTs) for AWIPS Local Applications and Linux for WFOs/RFCs: Allows for regional and field personnel to travel to NWSTC to perform curriculum reviews for these two courses.
- Hydrology:
 - [Advanced Hydrologic Applications](#) – will be transitioned to DL beyond FY11. There will two FY11 residence offerings. The first session may be an AWIPS I focused course.
 - [Community Hydrologic Prediction System \(CHPS\)](#) Training for RFCs: NWSTC will hire contract support for NWSTC to assume this training, previously provided by the CHPS developer, Deltares.

- Management/Leadership
 - Leadership Foundations FRT: Work will begin on creating a developmental experience for new employees that provides a strong leadership foundation for succession planning, leadership competencies at all levels, and improved operational performance.
 - New Hire – NWS New Employee Introduction: NWSTC staff will create DL courses and webinars to assist new employees in understanding the NWS.

- Observations
 - A three year program will begin in FY11 to develop Cooperative Network Operations DL modules to provide course prerequisites in field references and refresher training in an effort to optimize residence training with hands-on skills.

- Program Deployment Support:
 - Wind Profiler Deployment Support
 - Dual-Pol Development Support: Ensures Dual-Pol technical support of system development and training material development.
 - NWS LMS Support: Contract support will be hired to assist with maintenance of the NWS LEARNCenter and sub-NWS LEARNCenters.

- **III. Other Training Activities:**
 - International Weather and Water Leadership: Each year, there are unforeseen training needs and requests for TD. NWSTC is often asked by the NWS [International Activities Office](#) to support visiting foreign delegations.

Appendix 3: [Warning Decision Training Branch](#) – Table 3

I. In-Residence Training:

- Five [Distance Learning Operations Course \(DLOC\)](#) Workshops: These workshops provide 4 1/2 days of instructions on warning decision making applications and include daily WES simulations in WDTB's laboratory.\
- [Advanced Warning Operations Course \(AWOC\)](#) Facilitation Workshop: The AWOC Facilitation Workshop are targeted to new Science and Operations Officers (SOOs) / Development and Operations Hydrologists (DOHs), and training officers to address competencies of facilitation including mentoring, simulation support, LMS administration, adult learning, training and evaluation, decision support, and human factors.

II. Distance Learning Training Activities:

- Aviation:
 - Weather Event Simulator (WES) Simulations for Center Weather Service Unit (CWSU) Meteorologists: As part of an agreement negotiated with the NWS Employees' Organization, Web-based WES simulations will be made available to CWSU staff so they have the same training opportunities as other NWS staff.
 - WES Machine Upgrade for CWSUs: Related to the above, a computer in each CWSU will be upgraded to the WES-II configuration which will be present in all NWS WFOs.
- AWIPS:
 - [WES](#) Development and Support:
 - WES-II Bridge for AWIPS Migration: Continues to provide resources for design and initial development work.
 - WES-I Development and Support: WDTB will continue to update the WES software in concurrence with the AWIPS and AWIPS II training environment.
 - WES-I Logistics Support Funds: Provides funds to sites that require replacement parts for the current WES.
 - AWIPS II Enhancements Training: Addresses enhancements with the initial deployment of AWIPS II.
 - AWIPS II Variance Training (NWSTC and FDTB assists): Develop and deliver DL modules as necessary to address identified variances in the user interface as AWIPS I is updated to AWIPS II.
- Integrated Warning Process:
 - WSR-88D initial radar operator training via [DLOC](#).
 - [AWOC](#). The Core, Severe and Winter Weather Tracks will be updated and offered. In addition, a facilitator workshop will be offered to new SOOs, DOHs and training officers who did not receive this training when it was initially offered in 2004.
 - Warning Best Practices Training: Based on recommendations from two recent NWS Service Assessments: 1) *Super Tuesday Tornado Outbreak of 2008*; and 2)

Southeast U.S. Flood - Sept. 18-23, 2009, WDTB will update its existing courses on Storm-Based Warnings and deliver a new DL training module designed to share best practices and improve forecasters' ability to issue effective Storm-Based Warnings, including Flash Flood warnings. The Flash Flood Warning Best Practices module addresses Assessment findings related to use of enhanced wording in Flash Flood warnings and statements.

- Coordination, Collaboration and Communication During Warning Events: Provides support for the 2011 Annual Severe Weather Workshop, the continued development of modules for NWS forecasters, and an education and outreach module for NWS WCMs. This effort continues to be supported by the NOAA SeaGrant program.
- Decision Support for Communicating Risks During High Impact Events: Based on recommendations from the *NWS Service Assessment: Mother's Day Weekend Tornado May 10, 2008*; and lessons learned from decision support provided to the Deepwater Horizon Gulf Oil Spill, WDTB will develop a new module in FY11 on several aspects of threat communication which will help provide operational methodologies used for impact based decision support.
- Dual-Pol Upgrade to the WSR-88D: (*See <http://www.wdtb.noaa.gov/modules/dualpol/index.htm> for more information*)
 - Dual-Pol Operations Course: To be primarily delivered as online modules through the LMS with support from local facilitators, the course will address principles of Dual-Pol radar, products, and other related science and applications.
 - Dual-Pol Education and Outreach: Provide Web-based module(s) addressing the capabilities and limitations of the various WSR-88D Dual-Pol products which will be made available to the public.

III. Other Training Activities:

- Seasonal Readiness Assessment for Convective Weather: As part of the Severe Convection Forecasting and Warning Professional Development Series (PDS), WDTB will develop a seasonal readiness assessment tool, which will assist forecasters in determining knowledge and skill gaps for competencies in severe weather related job tasks.
- WES Simulation Support for Numerical Weather Prediction (NWP) Training: WDTB will continue to provide WES simulations in support of NWP training being developed by COMET/FDTB.
- GoToMeeting Licenses for TD: WDTB manages the funds and licenses required for the Division to use GoToMeeting software to conduct training, meetings, etc.
- NWS LMS Support: Funds contract support to assist with maintenance of the NWS LEARNCenter and sub-NWS LEARNCenters.
- International Weather and Water Leadership: Each year, there are unforeseen training needs and requests for TD via the NWS [International Activities Office](#).

Appendix 4: [Forecast Decision Training Branch - Table 4](#) [Cooperative Program for Meteorology, Education and Training \(COMET\) Training –Table 5](#)

I. Program Funding:

- [COMET](#) Grant Core Funding: Per NOAA cooperative agreement with the [University Corporation for Atmospheric Research \(UCAR\)](#), TD annually provides the core funding for the COMET Program. This funding supports the following costs:
 - Infrastructure and administrative costs
 - Support for the COMET [Meteorology, Education, and Training \(MetEd\) Website](#)
 - Support for COMET Classroom to conduct NOAA/NWS residence training
 - VISIT Salaries: TD provides funds for staff at the [Virtual Institute for Satellite Integration \(VISIT\)](#) in Fort Collins, CO and Madison, WI. The VISIT team includes staff from NWS, [National Environmental Satellite Data and Information Service \(NESDIS\)](#), and two NOAA Cooperative Institutes: The [Cooperative Institute for Research in the Atmosphere \(CIRA\)](#) and the [Cooperative Institute for Meteorological Satellite Studies \(CIMSS\)](#). The VISIT team supports satellite and related remote sensing training and provides assistance with live and recorded teletraining. VISIT and FDTB help develop a series of Satellite HydroMeteorology (SHyMet) courses that are also supported by NESDIS funds.

II. In-Residence Training (held at COMET). See Table 5 for cost information.

- [Flash Flood/Quantitative Precipitation Estimation \(QPE\) Course](#): Focuses on the hydrology of flash floods. This activity is funded by the NWS [Office of Hydrologic Development \(OHD\)](#) and NSTEP Base funds.
- [Meteorological Services of Canada \(MSC\)/COMET Winter Weather Workshop](#): Travel funds are provided for four NWS students and three NWS guest instructors participating in this MSC-funded course.
- [Advanced Hydrologic Science Course](#): Provides NWS hydrologists the ability to incorporate emerging hydrologic science into river forecasting operations and the provision of water resource services, including drought and low flow conditions. This course is also partially funded by [OHD](#).
- [Advanced Climate Variability and Change Course](#): COMET, in coordination with the [OCWWS Climate Services Division](#), will offer a follow-on in-residence course which will build on the skills learned in the Climate Variability course, which began as an in-residence course and is now offered as a virtual course.

III. Distance Learning Training:

- Aviation: With funds provided by the [OCWWS Aviation Services Branch](#), COMET will work on two aviation-related projects:
 - Volcanic Ash Training: COMET will produce volcanic ash modules, which will incorporate the impacts of, and how to deal with, ash clouds produced by volcanic eruptions using case studies from Alaska and the 2010 Icelandic volcanic eruption.
 - [Distance Learning Aviation Course \(DLAC\) III](#): Improving Aviation Weather Services: Module production of the third in a series of the highly successful DLAC courses will begin late in FY11.
- AWIPS:
 - AWIPS / [NWP](#) Development: Two project scientists are dedicated to NWP training development under COMET (Table 5) to develop and conduct NWP training, and WDTB staff for developing NWP WES cases. Funds are also provided to restore an FY10 funding cut in this area.
 - AWIPS II Focal Point Training: FDTB staff will work with NWSTC and WDTB staff to develop and provide AWIPS Focal Points with revised training on the new AWIPS II system.
 - AWIPS II Enhancements Training: Addresses enhancements with the initial deployment of AWIPS II.
 - AWIPS II Variance Training (WDTB and NWSTC assists): Develop and deliver DL modules as necessary to address identified variances in the user interface as AWIPS I is updated to AWIPS II.
- Climate:

In addition to the Advanced Climate Variability and Change in-residence training described in Section I of this appendix, the following DL activity will be offered in FY11:

 - [Virtual Climate Variability Workshop](#)
- Fire Weather:
 - With funds provided by the [OCWWS Fire and Public Weather Services Branch](#), COMET will continue work to develop a Fire Weather Professional Development Series (PDS) which will provide a training curriculum for fire weather forecasters, fire weather focal points and IMETs. Additional information on the PDS concept can be found [here](#).
- Hydrology:

In addition to the residence training being hosted by COMET, the following hydrology-related activities will occur during FY11:

 - Short- and Long-Term Ensembles: FDTB Development of a follow-on Web module to complement an initial module developed in FY09.
 - COMAP Symposium on QPF/Rapid Onset Floods (COMET)
- Integrated Sensor Training:
 - In collaboration with the VISIT program, NESDIS continues funding the expansion of the [Satellite Hydrometeorology \(SHyMet\) courses](#) for NWS interns,

forecasters, and SHyMet for Hydrologists. The Geostationary Orbiting Environmental Satellite (GOES) program provides funding for development of satellite training modules on COMET's Environmental Satellite Resource Center with needs identified at an annual satellite training workshop.

- Marine:
 - Marine Weather Services PDS Development: Travel Funds are set aside to continue developing this PDS, which will organize existing training and determine marine weather training needs.
 - Maintaining Workforce Knowledge and Skills / Currency of DL Materials: COMET will begin an effort to analyze the contents of its entire DL library to determine dated materials. The first area which will be of focus is marine weather. Other areas will be looked at as part of a multiyear effort to ensure existing DL materials are up to date.
- Meteorology
 - COMET [Virtual Boundary Layer Symposium](#)
- NWP:
 - Two project scientists are dedicated to NWP training development under COMET (Table 5). FDTB provides one dedicated FTE in support of Weather Research and Forecasting (WRF) Environmental Modeling Systems (EMS) development, training and support (both domestic and international). The first new NWP course being developed consists of seven instructional components, each focusing on the different uses of NWP in the forecast process and hands-on training through WES simulations. Updates to the NWP [Operational Models Matrix](#) will also continue in FY11 as the models change.
- Seasonal Readiness Assessment (Winter Weather):
 - Funds are provided to begin development of seasonal readiness assessment tools for Winter Weather for forecasters to take prior to each season to pinpoint individual training needs.
- Social Science:
 - Social Science Training: In August 2010, COMET captured lectures and presentations from the Weather and Society*Integrated Studies (WAS*IS) workshop held in the COMET classroom. FY11 funds are allocated to develop an introductory societal impacts module targeted for all NWS forecasters.

IV. Other Training Activities:

- International Weather and Water Leadership: Funds are set aside to address unforeseen training needs and requests for TD from the NWS [International Activities Office](#).

Appendix 5: Out Year Training Needs (FY 2012)

As has been done with previous Training Implementation Plans, the HOTG held a series of meetings with key NOAA Program Managers to educate them about existing NWS training activities within their programs and planned training activities. We expect to have a continuing dialogue with these key decision makers to find ways to resource needed training for the years beyond FY11. These managers also have the opportunity to review this IP and provide feedback before it is signed by the OCWWS Director.

The following training items were agreed to be deferred to, or will be done in FY 2012:

- AWIPS II Training
- Safety Training
- Wind Profiler Training
- NOAA Leadership Academy Training, including holding at least one offering of the Executive Leadership Seminar.
- COMET Mesoscale Analysis and Prediction (COMAP) course for new SOOs.
- Training Associated with Services 2020 (Human Factors, Societal Impacts, Seasonal Readiness and Enhanced Simulations)

Appendix 6: Overview of the National Strategic Training and Education Plan (NSTEP) Process

The FY 2011 Implementation Plan for NWS Training and Education (IP11) is the end result of the NSTEP process ([NWS Manual 20-102](#)). The NSTEP Team's Field Requirements Group (FRG), consisting of Regional Scientific Services Division (SSD) Chiefs/Regional Scientists or their designate(s), and the Operations Officer for the National Centers for Environmental Prediction (NCEP), prioritized FY11 training requirements. The Heads of Training Group (HOTG), composed of representatives from OS6, the Directors of the [NWS Training Center \(NWSTC\)](#), the [Forecast Decision Training Branch \(FDTB\)](#), the [Warning Decision Training Branch \(WDTB\)](#), and the [Cooperative Program for Operational Meteorology, Education, and Training \(COMET\)](#), recommended the execution methods of the prioritized training requirements, taking into account available FTE and non-FTE staff resources. FY11 training requirements were determined and prioritized during a series of meetings and conference calls which included the OCWWS NSTEP Program Leader, the FRG, HOTG, program managers, and other training representatives.

The FY11 NSTEP process began with soliciting training requirements submitted in the form of a Performance Needs Statement (PNS). A total of 158 PNSs were submitted for both existing and new training requirements. The HOTG analyzed all PNSs to determine the best delivery method [in-residence, DL, blended, etc., along with the training needs analysis]. Based on the HOTG analyses and the priority guidance listed below, the FRG proposed which training activities would be conducted using available funding and TD FTE resources.