

法規名稱：(終)Implementing Arrangement #20 Development of a High-Resolution Quantitative Precipitation Estimation and Quantitative Precipitation Forecast (HRQ2) System Pursuant to the Agreement between the Taipei Economic and Cultural Representative Office in the United States and the American Institute in Taiwan for Technical Cooperation in Meteorology and Forecast Systems Development

終止日期：民國 97 年 12 月 31 日

Implementing Arrangement #20 Development of a High-Resolution Quantitative Precipitation Estimation and Quantitative Precipitation Forecast (HRQ2) System Pursuant to the Agreement between the Taipei Economic and Cultural Representative Office in the United States and the American Institute in Taiwan for Technical Cooperation in Meteorology and Forecast Systems Development

Article I - Scope

This Implementing Arrangement describes the scientific and technical activities to be undertaken by the American Institute in Taiwan (AIT), through its designated representative, the Global System Division (GSD), (formally the Forecast Systems Laboratory) of the Earth System Research Laboratory (ESRL) of the National Oceanic and Atmospheric Administration (NOAA), United States Department of Commerce. It provides for continuing development of the forecast system being developed by the Joint Forecast Systems Project. This project is a cooperative effort between the Central Weather Bureau (CWB), the designated representative of the Taipei Economic and Cultural Representative Office in the United States (TECRO), and AIT's designated representative, NOAA/ESRL/GSD. This Implementing Arrangement is of mutual interest to both TECRO and AIT, hereafter referred to as the parties. The products of this Implementing Arrangement will provide substantial value through development of new and upgraded capabilities and applications that can be integrated into other NOAA/ESRL/GSD systems.

Article II - Authorities

The activities described in this Implementing Arrangement will be carried out under the general terms and conditions established by the Agreement between the Taipei Economic and Cultural Representative Office in the United States and the American Institute in Taiwan for Technical Cooperation in Meteorology and Forecast Systems Development (TECRO-AIT Agreement), and any subsequent revision as agreed to by the parties. This Implementing Arrangement is the twentieth such arrangement under a succession of umbrella agreements between TECRO and AIT.

This Implementing Arrangement is hereby attached to that Agreement and becomes part of the Agreement.

Article III - Services

During the period of Implementing Arrangement #20, TECRO's and AIT's designated representatives respectively, the CWB and NOAA/ESRL/GSD joint team, will focus on two tasks: (1) the development of a High-resolution Quantitative Precipitation Estimation and Quantitative Precipitation Forecast (HRQ2) System, and (2) continuing interaction on earlier cooperative projects. Tasks under this Implementing Agreement range from full scale developmental collaboration to system upgrades and support that allow systems to operate with the latest technical and scientific capabilities and specifications. These ongoing activities, described in more detail in the Statement of Work, will include the following two tasks:

Task #1 - High-Resolution Quantitative Precipitation Estimation and Quantitative Precipitation Forecast (HRQ2) System

During Implementing Arrangement #19, TECRO's and AIT's designated representatives, CWB and NOAA/ESRL/GSD respectively, has extended STMAS (Space and Time Mesoscale Analysis System) to 3D using conventional data. NOAA/ESRL/GSD also improved the conventional data ingest for STMAS and GSI (Gridpoint Statistical Interpolation) software. For GSI, we completed a new

conventional data converter and CWB satellite data conversation with a CWB visiting scientist's support. Now GSI is ready for radar, satellite data analysis and capable of analyzing some chemical observations (ozone, for example). NOAA/ESRL/GSD also established an ensemble-based error statistics generator for input into GSI/STMAS. During Implementing Arrangement #20, AIT's designated representative, NOAA/ESRL/GSD will provide new GSI software if it becomes available.

Initial tests of STMAS in 2D using radial wind were performed during Implementing Arrangement #19. Two cases tested were analytic function and a real CWB typhoon case. During Implementing Arrangement #20, TECRO's and AIT's designated representatives, CWB and NOAA/ESRL/GSD respectively, will continue to apply the radar radial wind analysis capability to the STMAS 3D analysis. We also plan to do the forecast impact study with radar data using STMAS and GSI under severe weather cases. We will compare STMAS forecast with LAPS/GSI.

LAPS has developed probabilistic post processing to evaluate, verify and optimized the Probabilistic Quantitative Precipitation Forecasts (PQPF) over the Southwest United States. This capability is extremely important for CWB, especially for their short-range PQPF verification. During IA #20, AIT's designated representative, NOAA/ESRL/GSD will provide some technical training on PQPF and will help to setup a similar post processing capability at CWB, if it is feasible.

During Implementing Arrangement #19, TECRO's and AIT's designated representatives, CWB and NOAA/ESRL/GSD respectively, ingested a limited case of GPS observation data from the CWB GPS-Met network and processed these data using the current NOAA GPS-Met Observing System for evaluation at CWB. During Implementing Arrangement #20, CWB is ready to send more real time data for production runs at the NOAA/ESRL/GSD facility. TECRO's and AIT's designated representatives, CWB and NOAA/ESRL/GSD respectively, will process these production data and transfer IPW values back to CWB for application.

AIT's designated representative, NOAA/ESRL/GSD, understands that the National Severe Storms Laboratory (NSSL) will continue research towards the refinement, development, and maintenance of applications required for the Central Weather Bureau (CWB), Water Resources Agency (WRA) and the Soil and Water Conservation Bureau (SWCB) operations. The NSSL research is directed towards improving the monitoring and prediction of flash floods and severe storm identification and short-term forecasting for the Taiwan environment. The NSSL research and development for IA#20 will focus on advancing HRQ2 QPE and severe weather applications per: 1) develop capability for real time ingest and integration of SoWMEX/TiMREX experimental radar data in HRQ2; 2) develop and implement interface for QPESUMS display of the HRQ2 single radar products; 3) development of initial dual polarization radar QPE; and 4) evaluation and refinements of the HRQ2.

Task #2 - Continuing Interaction on Earlier Cooperative Projects
Several earlier cooperative tasks have been completed.

Technology has been transferred successfully and is beginning to be used operationally at CWB. NOAA/ESRL/GSD's development activities in these areas continue, and further CWB-NOAA/ESRL/GSD interaction is important to keep CWB staff up-to-date on current developments. This task will allow continuing interaction at an appropriate level, including new software releases and available documents of the forecast information system including the ALPS (AWIPS Linux Prototype System), the AWIPS, future AWIPS development environment, AFPS text formatter software and user training, Internet-based forecast workstation (FX-C) software upgrade support and training if applicable, NOAAPORT data support, visitors training, exchange of visits, copying papers and reports, and e-mail interaction.

Article IV - Responsibilities of TECRO

In addition to participation in the joint project team, TECRO
A. Provide overall coordination project activities at the CWB

facility;

- B. Assign appropriate staff to perform the activities defined in this Implementing Arrangement and provide support in accordance with the terms of the umbrella agreement; and
- C. Fulfill its responsibilities under the Statement of Work for Implementing Arrangement #20.

Article V - Responsibilities of AIT

In addition to participation in the joint project team, AIT, through its designated representative, NOAA/ESRL/GSD shall:

- A. Provide overall coordination project activities at the NOAA/ESRL/GSD facility in Boulder, Colorado;
- B. Provide administrative support for preparing reports for delivery to TECRO's designated representative, CWB, in accordance with this Implementing Arrangement;
- C. Assign appropriate staff to perform the activities defined in this Implementing Arrangement and provide support in accordance with the terms of the umbrella agreement; and
- D. Fulfill its responsibilities under the Statement of Work for Implementing Arrangement #20.

Article VI - Financial Provisions

In accordance with the TECRO-AIT Agreement, TECRO is required to reimburse AIT for all costs incurred by AIT's designated representative, NOAA/ESRL/GSD, in association with the project covered by this Implementing Arrangement. AIT shall transfer to NOAA/ESRL/GSD all payments made by TECRO to AIT for costs incurred by NOAA/ESRL/GSD in association with this Implementing Arrangement.

The total cost for activities described in this Implementing Arrangement is mutually agreed to be U.S. \$800,000. TECRO agrees to transfer fifty percent of the funds to AIT in advance, with the remaining fifty percent to be transferred upon completion of the year's activities, to the extent that funds for this purpose have been provided by TECRO.



The performance by AIT's designated representative of activities under this Implementing Arrangement is subject to the availability of funds.

Article VII - Intellectual Property Considerations

No intellectual property considerations are expected to arise in conjunction with activities described in this Implementing Arrangement. Existing system designs and computer software of the NOAA/ESRL/GSD Forecast System are in the public domain. Reports, specifications, and computer software prepared under this Implementing Arrangement also will be in the public domain once NOAA and CWB have approved them in final form.

Article VIII - Effective Date, Amendment, and Termination

This Implementing Arrangement is effective on the date of the last signature hereto. This Implementing Arrangement may be amended and/or terminated in accordance with the terms of the Agreement. The estimated completion date for the activities described in this Implementing Arrangement is December 31, 2008.

FOR THE TAIPEI ECONOMIC AND
CULTURAL REPRESENTATIVE
OFFICE IN THE UNITED STATES

FOR THE AMERICAN INSTITUTE
IN TAIWAN

Barbara Schrage
Managing Director

Date

Date