PROGRAM REVIEW

IERL-RTP's Acid Deposition Research Program

February 6, 1984

TABLE OF CONTENTS

A G E N D A

IERL-RTP ACID DEPOSITION PROGRAM REVIEW

February 6, 1984

Research Triangle Park, North Carolina

10:00	Introduction
10:15	Emission Inventory
11:00	Emission Modeling
12:00	LUNCH
1:30	Control Technology
2:00	Peer Review Activities
2:30	General Areas Requiring Management Attention
3:00	Outlook
3:15	General Discussion
3:45	Summary of Action Items
4:00	Adjourn

Goal

The goal of IERL-RTP's acid deposition program is to characterize man-made emissions of acid deposition precursors and assess techniques to reduce these emissions.

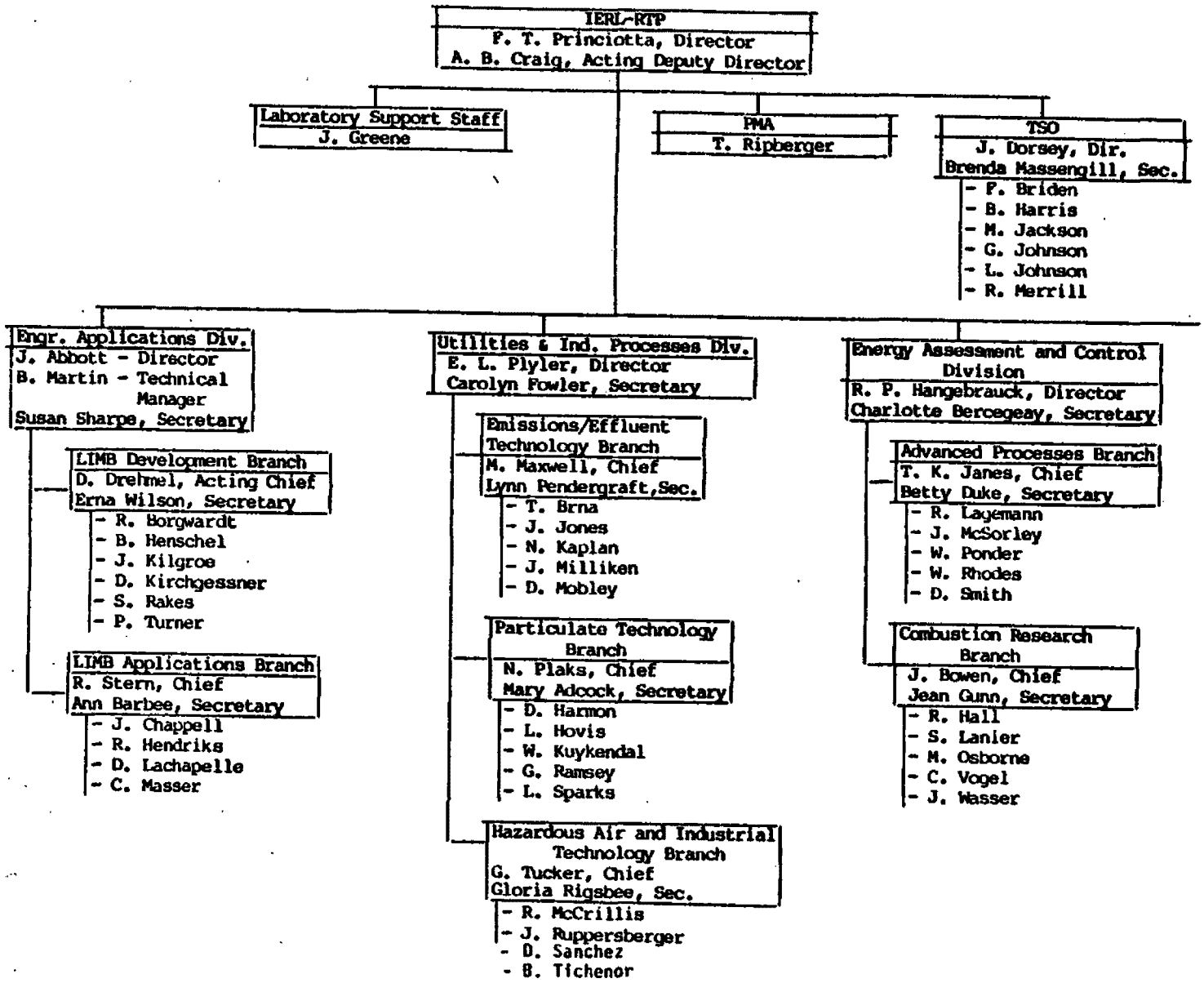
Objectives

1. Provide an accurate and complete inventory of emissions from man-made sources believed to be important in acid deposition processes with adequate geographic, temporal, species, and sectorial resolution.

2. Provide models which predict emissions as well as the emissions reduction potential, cost and other impacts of alternative strategies for control of acid deposition.

3. Provide an adequate information base on the cost and performance of techniques for control of acid deposition precursor emissions from man-made stationary sources.

PROPOSED IERL-RTP TENTATIVE ORGANIZATIONAL STRUCTURE



National Acid Precipitation Assessment Program

Task Groups

A. Natural Sources

*B. Man-Made Sources

C. Atmospheric Processes

D. Deposition Monitoring

E. Aquatic Effects

F. Terrestrial Effects

G. Materials Effects

*H. Control Technologies

*I. Policy and Assessments

J. International Activities

*IERL-RTP actively supporting

Key Industrial Environmental Research Laboratory Personnel

Frank T. Princiotta
Director, Industrial Environmental Research Laboratory/RTP
Chairman, NAPAP Task Group H - Control Technologies
Chairman, Work Group 3B - Emissions, Costs and Engineering
U.S. Canadian MOI

Everett L. Plyler
Director, Utilities and Industrial Processes Division
EPA Member, NAPAP Task Group H - Control Technologies

Michael A. Maxwell
Chief, Emissions/Effluent Technology Branch
EPA Member, NAPAP Task Group B - Man-Made Sources

J. David Mobley
Program Manager
Alternate EPA Member, NAPAP Task Group B - Man-Made Sources

John O. Milliken
Program Manager
Alternate EPA Member, NAPAP Task Group H - Control Technologies

IERL-RTP NAPAP

Budget Summary

	FY82	FY83	FY84	FY85
Emission Inventory	50	230	240	600
Emission Modeling	50	820	850	450
Control Technology	0	0	0	600
	100	1050	1090	1650

PROJECT DESCRIPTION

DU Code: N 1 0 4 [Multimedia - Energy]
OBJ Code: C [Estimate Emissions from Man-Made Sources]
PA Code: 01 [Comprehensive Emission Inventory]
RC Code: F [IERL-RTP]
[Titles]

PROJ Code: 01 YR: 8 4 Version: O P L A N [(Check one) NEW__ EXISTING X]

MANAGER: J. David Mobley PHONE:629-2578

SHORT TITLE: Emissions Data
LONG TITLE: Comprehensive Emissions Inventories and Supporting Data

PLANNED START:1 0 /8 0 PLANNED END:0 9 /8 9

RESOURCES:

	TV:		TV:
PFTE	___._	SUPERFUND	$__,___._
OPFTE	___._	ADP	$__,___._
S&E	$__,___.	REIMBURSABLES	$__,___._
R&D	$__,230.0	ABATEMENT & CONTROL	$__,___._
TOTAL	$__,230.0	CARRYOVER	$__,___._

* *

AL/RATIONALE/APPROACH:

GOAL: This project will provide a central, quality assured data base of emissions of pollutants of interest for acid deposition modeling & analysis. The project will assemble or develop needed emissions information, disaggregated as appropriate by geographic region, time period, & chemical species. The project will support the related activities of the National Acid Precipitation Assessment Program (NAPAP). RATIONALE: Detailed emissions information is a critical input to atmospheric processes research & also supports evaluation of historic effects, trends, & planning of monitoring research programs. This information is also used in policy assessments of the relative importance of various pollutants, geographic regions, & source types. APPROACH: The basic approach is to utilize existing sources of information where possible and to conduct comparisons of alternative sources where available as a means of quality assurance. The project will assemble or develop needed emissions information, disagregated as appropriate by geographic region, time period, and chemical species. The uncertainties associated with the elements in this inventory at each degree of resolution will be specified.

* *

[Laboratory Director Approval] [Date] [Office Director Approval] [Date]

[Frank T. Princiotta] [09/27/83] [ ] [ ]

PROJECT OUTPUT PLAN

DU Code: N 1 0 4 OBJ Code: C PPA Code: 0 1 RC Code: F PROJ Code: 0 1

ITEM #: 0 2 3 2[A] PROD Code: A 0 3[Project Report]

DESCRIPTOR: NAPAP Historical Emission Inventory

DUE DATE: 0 6/8 4 FUND Code: C [A = Advanced; C = Continuing]
[Requestor: NAPAP (Gary Foley)] CUST Code: 0 9 0 [ORD]
[ORD Project Officer: J. David Mobley]
[Lab Draft #: _____ Lab Workplan #: 3142 Contract/Grant/IAG #: 68-02-3511/31]

* *

ITEM #: 0 2 3 3[A] PROD Code: A 0 3 [Project Report]

DESCRIPTOR: NAPAP Emission Inventory for the 1980 Base Year to Support Lagrangian Atmospheric Models

DUE DATE: 0 6/8 4 FUND Code: C [A = Advanced; C = Continuing]
[Requestor: NAPAP (Gary Foley)] CUST Code: 0 9 0 [ORD]
[ORD Project Officer: J. David Mobley]
[Lab Draft #: _____ Lab Workplan #: 3143 Contract/Grant/IAG #: 68-02-3509/40]

* *

ITEM #: 0 2 3 4[A] PROD Code: A 0 3 [Project Report]

DESCRIPTOR: Preliminary Emission Inventory to Support Testing & Development of an Eulerian Atmospheric Model

DUE DATE: 0 3/8 5 FUND Code: C [A = Advanced; C = Continuing]
[Requestor: NAPAP (Gary Foley)] CUST Code: 0 9 0 [ORD]
[ORD Project Officer: J. David Mobley]
[Lab Draft #: _____ Lab Workplan #: 3144 Contract/Grant/IAG #: 68-02-3509/40]

* *

ITEM #: 0 2 3 5[A] PROD Code: A 0 3 [Project Report]

DESCRIPTOR: NAPAP Emission Inventory for the 1984 Base Year to Support the Eulerian Atmospheric Model

DUE DATE: 1 2/8 5 FUND Code: C [A = Advanced; C = Continuing]
[Requestor: NAPAP (Gary Foley)] CUST Code: 0 9 0 [ORD]
[ORD Project Officer: J. David Mobley]
[Lab Draft #: _____ Lab Workplan #: 3145 Contract/Grant/IAG #: _____]

FY 84 R&D TASK DESCRIPTION

DU/PA N104Q/Acid Rain
TASK # N33
PO Mobley
DATE 06/21/83
MATRIX Program Office

Title: NAPAP Emission Inventory Development, Maintenance, and Management

Objective: This project will provide a central, quality assured data base of emissions of pollutants of interest for acid deposition modeling and analysis. The project will assemble or develop needed emissions information, disaggregated as appropriate by geographic region, time period, and chemical species. The project will support the related activities of the National Acid Precipitation Assessment Program (NAPAP).

Rationale: Detailed emissions information is a critical input to atmospheric processes research and also supports evaluation of historic effects, trends, and planning of monitoring research programs. This information is also used in policy assessments of the relative importance of various pollutants, geographic regions, and source types.

Primary User: Interagency Task Force on Acid Precipitation **Secondary User:** Office of Air Noise & Radiation

Benefits/Uses: The outputs of this activity will be used by the Lagrangian and Eulerian atmospheric modelers involved in analyzing acid deposition formation mechanisms and mitigation measures.

Contractor: Engineering Science
Contract #: 68-02-3509
FY 84 R&D $ 100K
$ to Complete 500K (FY85)

FY 84 R&D TASK DESCRIPTION

DU/PA N104Q/Acid Rain
TASK # N34
PO Mobley
DATE 7/20/83
MATRIX Program Office

Title: NAPAP Emission Inventory Emission Factor Assessment

Objective: Develop emission factors for non-criteria pollutants, produce photochemical reactivity classes from the disaggregation of VOC emissions, and allocate spatial and temporal emissions to resolute levels, and compile the results into the NAPAP Emission Inventory. The project will utilize existing emission factor calculation methods developed for EADS and will use the EADS as the mechanism for storing and analyzing any test data used to produce emission factors.

Rationale: In order to provide an emissions inventory for the Naitonal Acid Precipitation Assessment Program (NAPAP) with the appropriate specie, temporal, and spacial resolution, development of emission factors will be required.

Primary User: Interagency Task Force on Acid Precipitation **Secondary User:** Office of Air Noise & Radiation

Benefits/Uses: The outputs of this activity will be used by Lagrangian and Eulerian atmospheric modelers involved in analyzing acid deposition formation mechanisms and mitigation measures.

Contractor: GCA, Inc.
Contract #: 68-02-3168
FY 84 R&D $ 90.0
$ to Complete 500K (FY85)

FY 84 R&D TASK DESCRIPTION

DU/PA N1040/Acid Rain
TASK # N37
PO Mobley
DATE 06/21/83
MATRIX Program Office

Title: NAPAP Emission Inventory Review and Critique

Objective: The NAPAP Emission Inventory is one of the most important inputs into the assessment framework for evaluating acid deposition and alternatives for its control. Accordingly, an independent and objective assessment of the accuracy and validity of the inventory is needed.

Rationale: The emission inventory for the National Acid Precipitation Assessment Program (NAPAP) will be reviewed and critiqued to ensure that it has the accuracy and specificity needed to satisfy potential users. In addition, support to IERL-RTP personnel on Task Groups B, H, and I will be provided on critical issues.

Primary User: Interagency Task Force on Acid Precipitation **Secondary User:** Office of Air Noise & Radiation

Benefits/Uses: The developers of the emission inventory and emission factors will utilize the outputs of this project along with members of the Task Force to guide activities to ensure that resources are expended in the most productive manner.

Contractor: To Be Determined
Contract #: To Be Determined
FY 84 R&D $ 40K
$ to Complete 50K (FY85)

Emission Inventory Accomplishments

1. Worked closely with EPA/OAQPS personnel on the development and planning of NAPAP emission inventory activities.

2. Completed "NAPAP Emissions Inventory Implementation Plan" 08/83 Final Report, TRW Contract No. 68-02-3174, Task 96.

3. Made significant progress on compiling the NAPAP Emission Inventory for the 1980 Base Year.

   a. Established the initial version of NAPAP Emission Inventory - 03/83.

   b. Improved the NAPAP Emission Inventory for the 1980 Base year:

      i. incorporated latest EPA emission factors (through Supplement 14 of AP-42)

      ii. substituted other NEDS point source data that more represented calendar year 1980 for 12 states

      iii. added county centroid latitude and longitude for point sources with missing or incorrect UTM data

      iv. updated fuel type, quantity and quality, source classification code, control equipment and efficiency, and boiler capacity for all boilers that could be matched in Pechan Unit Inventory (1980).

      v. Updated seasonal throughput for all boilers matched in Pechan Unit Inventory using FPC Form 4 data for 1980.

      vi. Updated copper smelters to reflect SO_2 emissions in Work Group 3B inventory (1980).

      vii. Substituted plants in NECRMP inventory (1980) for those in NAPAP. Did not substitute for power plants in NAPAP containing boilers updated with Pechan data. Examined largest SO_2 emitters in NECRMP in relation to NAPAP and only selected data in NECRMP that was an improvement over NAPAP. Incorporated through Supplement 14 emission factors in NECRMP data selected.

      viii. Added seasonal factors for 31 major area source categories.

   c. Delivered computer tape of the 1980 NAPAP Emission Inventory to support Lagrangian modelers - 12/31/83

   d. Documented "Development of the Emission Inventory for the 1980 Base Year" 02/84 Draft Report, Engineering Science Contract No. 68-02-3509, Tasks 40, 57, and 58.

4. Awarded an Interagency Agreement to Brookhaven National Lab for "Analysis of the Uncertainty of the NAPAP Emission Inventory."

5. Made significant progress on emission factors

   a. "Assessment of the Technical Feasibility of Adapting the NECRMP Allocation Factors for the NAPAP Emission Inventory" 05/83 Technical Memorandum, GCA Contract No. 68-02-3168, Task 90.

   b. "NO_x Emissions from Direct-Fired Heaters Using Air Preheat" 05/83 Technical Memorandum, GCA Contract No. 68-02-3168, Task 90.

   c. "Development of Emission Factors for Anthrapogenic Sources of Ammonia Emissions" 06/83 Draft Report, GCA Contract No. 68-02-3168, Task 90.

   d. "Assessment of Emission Factors for the NAPAP Emissions Inventory" 08/83 Draft Report, GCA Contract No. 68-02-3168, Task 90.

   e. "Primary Sulfate Emission Factors for the NAPAP Emissions Inventory" 09/83 Draft Report, TRW Contract No. 68-02-3174, Task 96.

   f. "Allocation Factors and Algorithms for the NAPAP Emission Inventory" 10/83 Technical Memorandum, GCA Contract No. 68-02-3168, Task 90.

   g. "Assessment of NO_x Emission Factors for Direct-Fired Heaters" 01/84 Draft Report, GCA Contract No. 68-02-2693, Task 24.

   h. "Assessment of Ammonia, HCl, and HF Emission Factors for the NAPAP Emission Inventory" 02/84 Draft Report, GCA Contract No. 68-02-3168, Task 90.

6. Made significant progress on the historical emission inventory by documenting "Historic Emissions of Sulfur and Nitrogen Oxides in the United States from 1900 to 1980," 10/83 Draft Report, PES Contract No. 68-02-3511, Task 31.

7. Maintained extensive coordination activities:

   a. Coordinated with DOE Task Group B Leadership

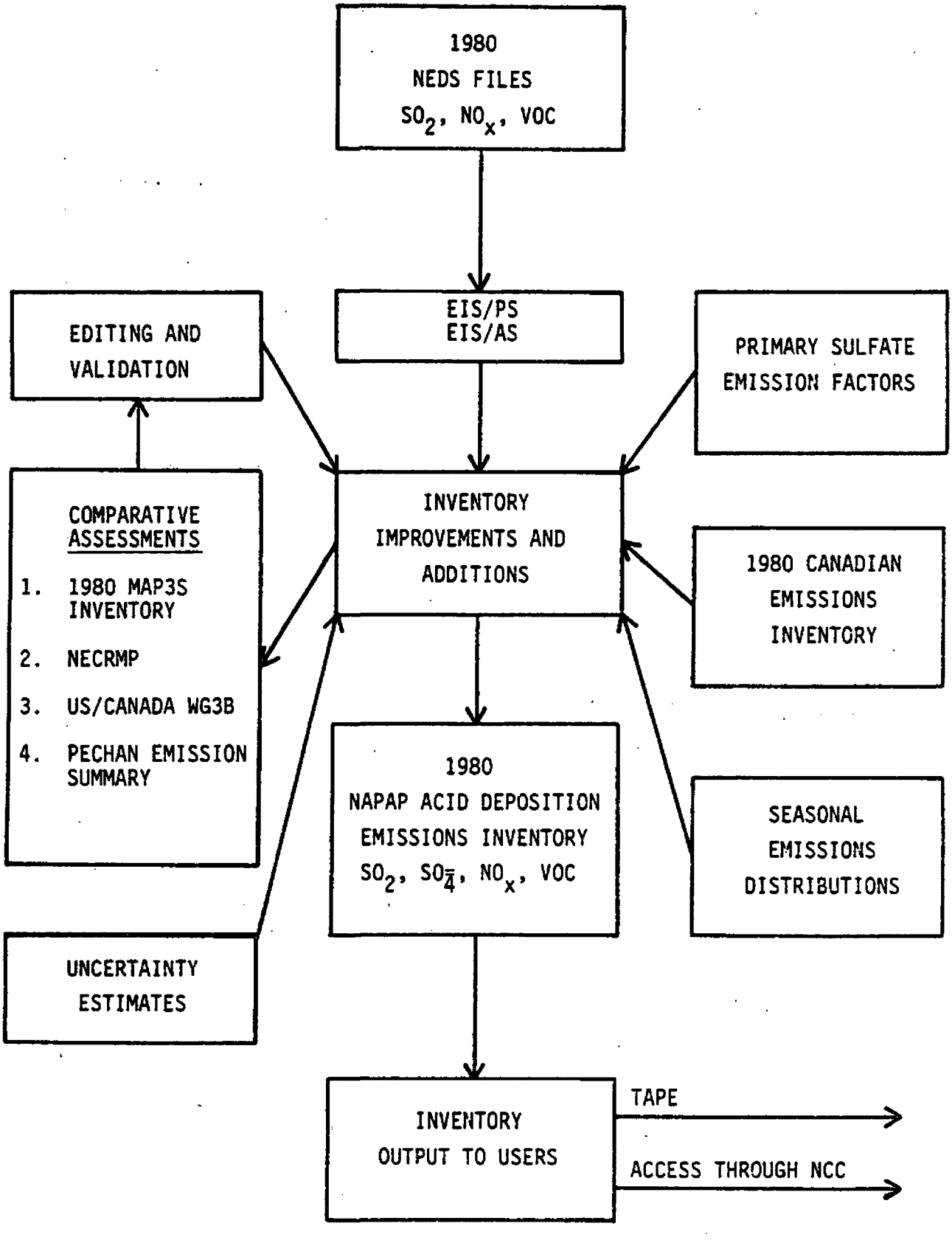
      i. Specification Document
      ii. Review/Reconciliation Plan
      iii. Internal Review Panel
      iv. Accuracy Workshop
      v. Peer Reviews

   b. Coordinated with ESRL/TGC personnel on atmospheric modeling needs of the emission inventory (ongoing).

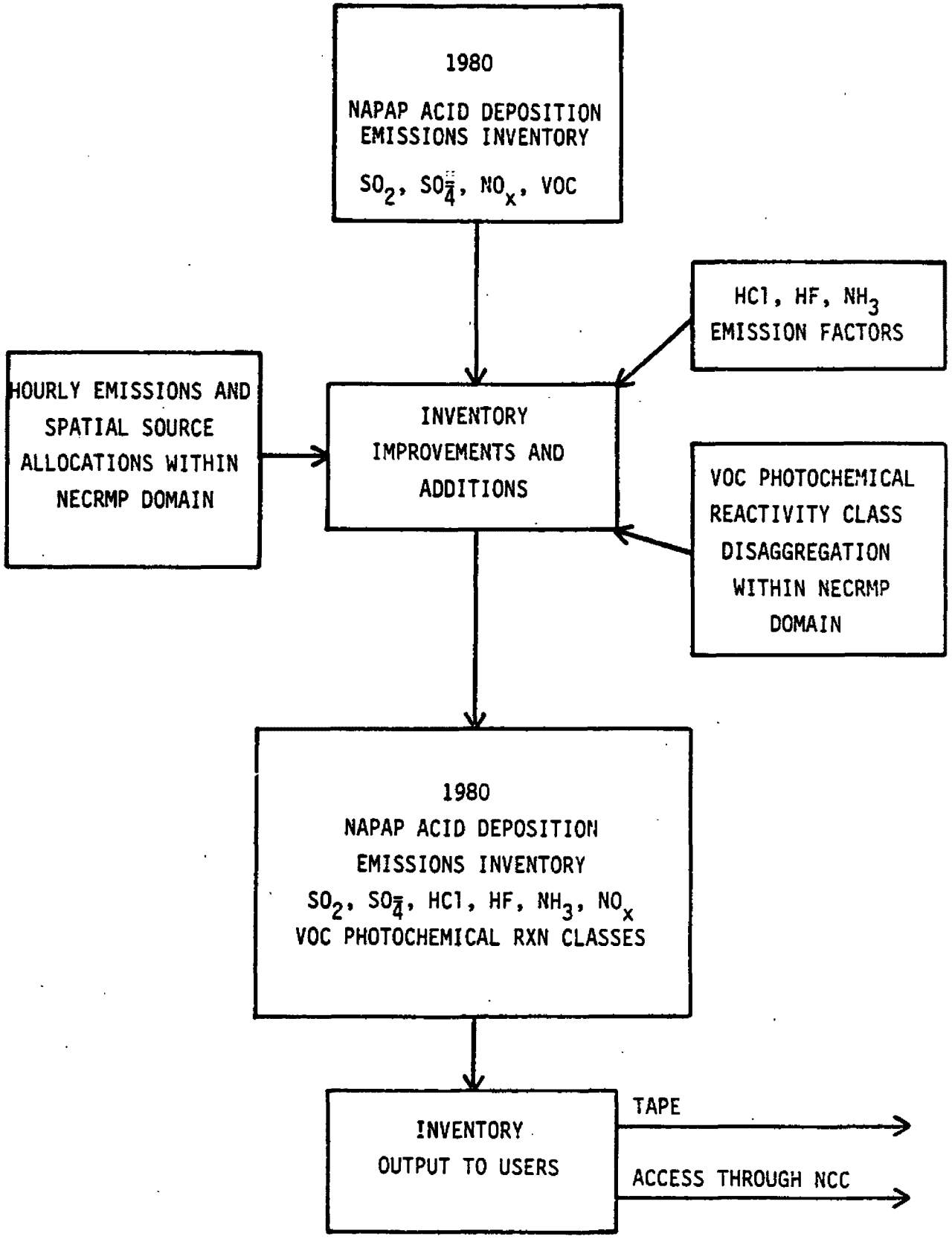
   c. Focused DOE/PETC work to in-house testing for improvement of sulfate and chloride emission factors (04-08/83).

   d. Coordinated with Canadians on emission inventory activities (highlighted by 08/83 trip to Canada by OAQPS personnel).

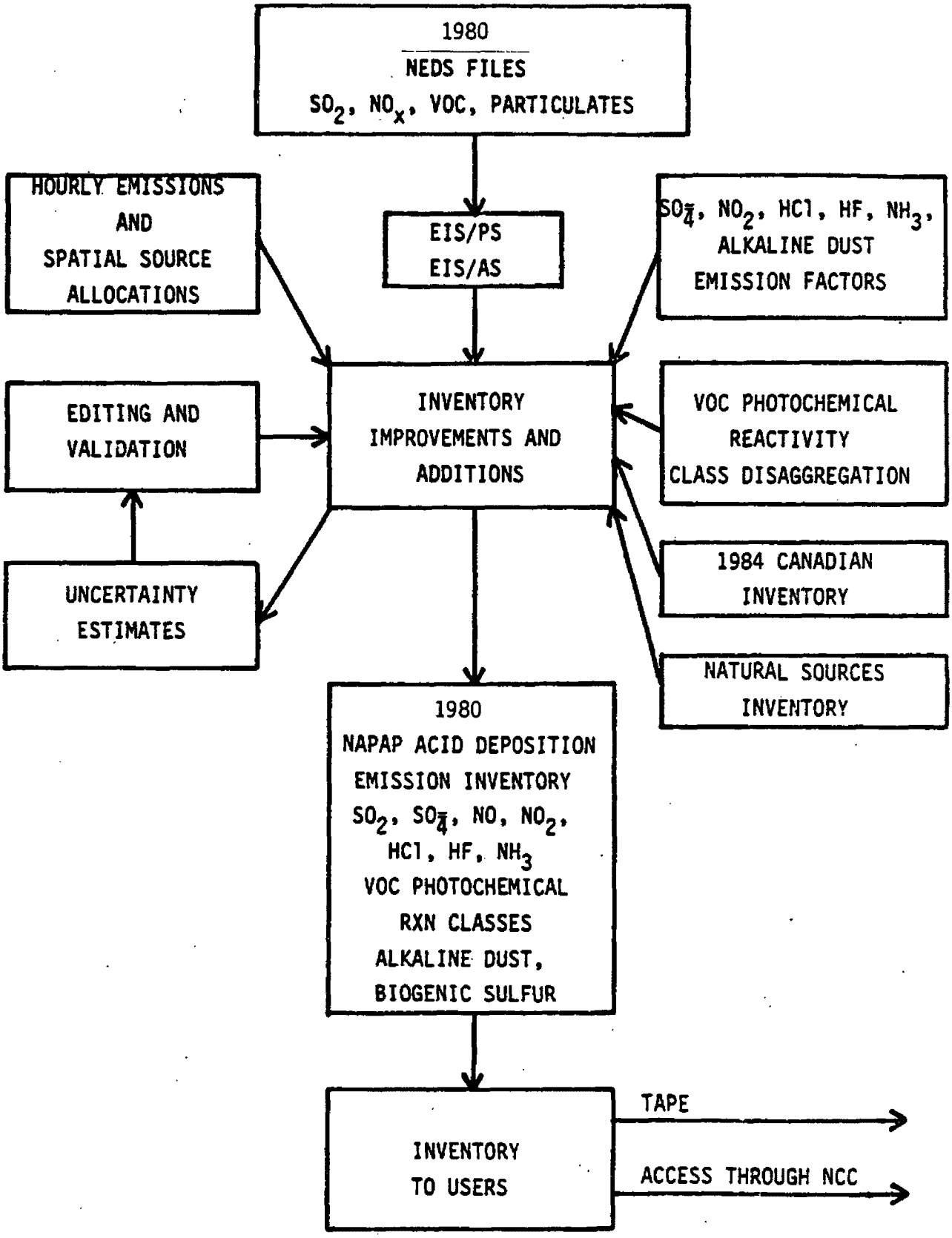
8. Provided current and historical emission inventory information to a host of interested parties.



FY83 ACTIVITIES



FY84 ACTIVITIES



FY85 ACTIVITIES

Task Group B

Emission Inventory

Budget Summary

($K)

Organization	FY82	FY83	FY84	FY85
EPA	50	230	240	600
DOE	300	300	260	450
Total	350	530	500	1050

Emission Inventory Areas Requiring Management Attention

1. The emission inventory is currently being developed for the 1980 base year. Should a funding initiative be submitted to develop a comparable emission inventory for 1981, 1982, etc.?

2. An emission inventory was initially planned for the 1984 base year to coincide with a dry deposition monitoring program to support validation of the Eulerian model. What year, if any, is appropriate currently for planning purposes?

3. The memo on "Highlights of Program Management Review of Task Groups D and I" (Bill Cogger, 01/25/84) contains the statement: "A memo from Courtney Riordan to EPRI will be prepared to ensure that the update of the 1980 emissions inventory to 1982 will be ready for the 1985 assessment." What does this mean and what action does this imply for Task Group B and EPA?

4. The emission inventory has been designed to provide hourly profiles of typical weekday and weekend days for each season. However, it has been suggested by some (and contradicted by others) that atmospheric models may be executed for specific time periods (e.g., June 1-7, 1983) and that actual emissions for that period will be required. What is the actual situation and should any funding initiatives be submitted in this regard?

5. The emission inventory was planned to have indications of the probable error of the emission estimates and to advance the state-of-the-art a modest amount in this area. However, this planned effort does not appear to be commensurate with the current emphasis within NAPAP (and its peer review community) on accuracy, precision, uncertainty, etc. Should a funding initiative be submitted in this regard?

6. The emission inventory was designed to provide detailed species, spatial, and temporal resolution within the NECRMP domain by 09/30/84. However, the modelers have requested that the entire U.S. be covered by this time and have requested the following additional pollutants: CO, total mass aerosols, graphitic carbon, organic carbon, nitrate, iron, manganese, and alkaline dusts plus 14 VOC splits. Should a funding initiative by submitted in this regard?

7. The Work Group 3B activity indicated that the probable error of the estimate for SO_2 emission estimates at the state level on an annual average basis was about 14%. Recognizing that the annual average SO_2 inventory is the best of the various species for a given time period, the measure of uncertainty for other species for shorter time periods and smaller geographic areas will be enormous (i.e., formaldehyde emissions for a one hour period on a summer weekend day on a specific 20x20 km grid). Is this going to be adequate to support the Eulerian model?

8. The current budget for emission inventory development does not allow for field testing to develop emission factors. This has forced reliance on existing information for the various species, temporal and spatial allocations, and source categories. In many cases, available information is sparce and of questionable quality since priorities have not been placed on acquiring such information previously. Should a funding initiative be submitted to develop improved emission factors?

9. The emission inventory was planned to pull together the best emission information available (NEDS, NECRMP, WG3B, DOE/Pechan, etc.). Should a funding initiative be submitted to obtain verification by the States of the NAPAP emission inventory?

10. The MATEX, or similar programs, will place new demands on emission inventories. Are plans that are being developed allocating resources for the emission inventory components of such experiments?

11. The historical emission inventory was planned to estimate SO_2 and NO_x emissions for each state in five year increments from 1900 to 1980. At the Boston Peer Review Meeting, information was distributed which indicated Task Group I's expectations from Task Group B included:

    o Detailed historic emissions of SO_2 and SO_4 for 10 or more recent years for each county and month by mid 1984

    o Historic SO_x and NO_x emissions for the past 50-100 years for each year and state by early 1984

    It is now apparent that finalization of the current draft report and delivery of the additional milestones cannot be met with high quality products with currently available resources. Which is preferred -- quality or quantity?

12. Workshops and seminars have been considered to inform users and other interested parties of the capabilities and contents of the inventory. What priority do you place on emission inventory information transfer activities?

PROJECT DESCRIPTION

DU Code: N 1 0 4 [Multimedia - Energy]
OBJ Code: C [Estimate Emissions From Man-Made Sources]
PA Code: 0 2 [Source Sector Models & Methods]
RC Code: F [IERL/RTP]
[Titles]
PROJ Code: 0 1 YR: 8 4 Version: 0 P L A N [(Check one) NEW__ EXISTING X]

MANAGER: M.A. Maxwell PHONE:629-2578

SHORT TITLE: Source Models
LONG TITLE: Source Sector Models and Methods

PLANNED START:1 0 /8 0 PLANNED END:0 9 /8 9

RESOURCES:

	TY:		TY:
PFTE	___.__	SUPERFUND	$___,___.__
OPFTE	___.__	ADP	$___,___.__
S&E	$___,___.__	REIMBURSABLES	$___,___.__
R&D	$___,760.0	ABATEMENT & CONTROL	$___,___.__
TOTAL	$___,760.0	CARRYOVER	$___,___.__

* *

GOAL/RATIONALE/APPROACH:

GOAL: The goal is to develop state-of-the-art analytical models to support EPA and NAPAP policy analysis and assessments. The objectives of the models are: (1) to simulate the distribution & characteristics of man-made sources of acid deposition precursors for varying conditions of economic growth, fuel supply, emissions regulations & control techniques; and (2) to estimate the cost and other impacts of alternate control strategies. Emphasis will be on modeling the utility & industrial combustion sectors, since these are major sources of emissions of SO_2 and NO_x.
RATIONALE: These models are needed to enable assessment of the cost and effectiveness of alternative acid deposition control strategies.
APPROACH: The approach is to develop individual sectoral models (e.g., Advanced Utility Simulation Model and Industrial Combustion Emissions Model), and to integrate these into a multisector model.

* *

[Laboratory Director Approval] [Date] [Office Director Approval] [Date]

[Frank T. Princiotta] [09/27/83] [ ] [ ]

PROJECT OUTPUT PLAN

DU Code: N 1 0 4 OBJ Code: C PPA Code: 0 2 RC Code: F PROJ Code: 0 1

ITEM #: 0 2 3 6[A] PROD Code: A 0 5[Unpublished Report]

DESCRIPTOR: Operational State Level AUSM & Data Bases to Support 1985 Assessments

DUE DATE: 0 4/8 4 FUND Code: C [A = Advanced; C = Continuing]
[Requestor: NAPAP (Gary Foley)] CUST Code: 0 9 0 [ORD]
[ORD Project Officer: J.O. Milliken]
[Lab Draft #: Lab Workplan #: 3146 Contract/Grant/IAG #: CR 808 514]

* *

ITEM #: 0 2 3 7[A] PROD Code: A 0 3 [Project Report]

DESCRIPTOR: Final Report for State-Level AUSM

DUE DATE: 0 9/8 4 FUND Code: C [A = Advanced; C = Continuing]
[Requestor: NAPAP (Gary Foley)] CUST Code: 0 9 0 [ORD]
[ORD Project Officer: J.O. Milliken]
[Lab Draft #: Lab Workplan #: 3147 Contract/Grant/IAG #: CR 808 514]

* *

ITEM #: 0 2 3 8[A] PROD Code: A 0 2 [Research Report]

DESCRIPTOR: Final Report for National Level AUSM

DUE DATE: 0 6/8 5 FUND Code: C [A = Advanced; C = Continuing]
[Requestor: NAPAP (Gary Foley)] CUST Code: 0 9 0 [ORD]
[ORD Project Officer: J.O. Milliken]
[Lab Draft #: Lab Workplan #: 3148 Contract/Grant/IAG #: CR 808 514]

* *

ITEM #: 0 2 3 9[A] PROD Code: A 0 3 [Project Report]

DESCRIPTOR: Project Report & Computer Code on Initial ICE Model for Industrial Boilers

DUE DATE: 0 3/8 5 FUND Code: C [A = Advanced; C = Continuing]
[Requestor: NAPAP (Gary Foley)] CUST Code: 0 9 0 [ORD]
[ORD Project Officer: J. David Mobley]
[Lab Draft #: Lab Workplan #: 3149 Contract/Grant/IAG #: 68-02-3930]

PROJECT OUTPUT PLAN

PU Code: N 1 0 4 OBJ Code: C PPA Code: 0 2 RC Code: F PROJ Code: 0 1

ITEM #: 0 2 4 0[A] PROD Code: A 0 3[Project Report]

DESCRIPTOR: Project Report & Computer Code for Initial ICE Model for Industrial Boilers and Process Heaters

DUE DATE: 0 3/8 6 FUND Code: C [A = Advanced; C = Continuing]
[Requestor: NAPAP (Gary Foley)] CUST Code: 0 9 0 [ORD]
[ORD Project Officer: J. David Mobley]
[Lab Draft #: Lab Workplan #: 3150 Contract/Grant/IAG #: 68-02-3930]

* *

ITEM #: 0 2 4 1[A] PROD Code: A 0 3 [Project Report]

DESCRIPTOR: Project Report & Computer Code on Completed ICE Model to Support the 1987 and 1989 Assessments

DUE DATE: 0 3/8 7 FUND Code: C [A = Advanced; C = Continuing]
[Requestor: NAPAP (Gary Foley)] CUST Code: 0 9 0 [ORD]
[ORD Project Officer: J. David Mobley]
[Lab Draft #: Lab Workplan #: 3151 Contract/Grant/IAG #: 68-02-3930]

* *

ITEM #: 0 2 4 5[A] PROD Code: A 0 3 [Project Report]

DESCRIPTOR: Project Report & Computer Code for Retirement Age Forecast Model

DUE DATE: 0 4/8 5 FUND Code: C [A = Advanced; C = Continuing]
[Requestor: NAPAP (Gary Foley)] CUST Code: 0 9 0 [ORD]
[ORD Project Officer: J. O. Milliken]
[Lab Draft #: Lab Workplan #: 3152 Contract/Grant/IAG #:]

* *

ITEM #: [ ] PROD Code: [ ]

DESCRIPTOR: Project Report & Computer Code for Industrial VOC Model

DUE DATE: 0 3/8 6 FUND Code: C [A = Advanced; C = Continuing]
[Requestor: NAPAP (Gary Foley)] CUST Code: 0 9 0 [ORD]
[ORD Project Officer: J. David Mobley]
[Lab Draft #: Lab Workplan #: Contract/Grant/IAG #:]

Task Group B

Emission Modeling

Budget Summary

($K)

Project	Organization	FY82	FY83	FY84	FY85
AUSM	EPA/HQ	820			
	EPA/RTP		450	400*	100
Ind NO_x/SO_x	EPA/RTP	50	370	300	150
Ind VOC	EPA/RTP			60	200
	EPA/HQ			30	
Tran/Res/Com	DOE				100
Retirement	EPA/RTP			60	
Forecast Driver	DOE				50
Tech. Penetration	DOE				50
Long Range Forecast	DOE				100
Integration	EPA/HQ			200	150
Subtotal	EPA/RTP	50	820	820*	450
	EPA/HQ	820	0	230	150
	DOE	0	0	0	300
Total		870	820	1050*	900

*Includes 200K Supplement from EPA Funding

Modeling Areas Needing Management Attention

1. The funding for the EPA modeling program went from $1050K to $600K from FY84 to FY85 (Task Group B, $850K to $900K) while the NAPAP funding doubled. Since increased demands are being placed on the modeling program, should a funding initiative be submitted to allow the modeling program to keep pace with demands from NAPAP and EPA?

2. As the models become available for testing and validation, it is anticipated that extensive requests for model runs will be received from EPA, NAPAP, and others. What policy should be adopted with respect to funding and access to the models and their preliminary results?

3. Since the NAPAP models are not the only ones likely to be used by EPA personnel, what policy should be pursued regarding potential conflicts (e.g., ICF vs AUSM, IFCAM vs ICE)?

4. The planned model testing and validation activities do not appear to be commensurate with the current emphasis within NAPAP (and its peer review community). Should a funding initiative be submitted in this regard?

5. It has been proposed by some (and contradicted by others) that the atmospheric modelers will need detailed emission information for future years (such as 2000) similar to what is being provided for 1980 (such as speciated VOC emissions with hourly profiles and 20x20 km griding). What is the actual situation and should a funding initiative be submitted in this regard?

6. The April 1983 IERL/RTP peer review panel emphasized the importance of accelerating the integrated modeling effort. The problems of combining independently developed and differently structured sectoral models into an integrated model were pointed out. Would it make sense to centralize the development of the component and integrated emission models at IERL/RTP?

FY 84 R&D TASK DESCRIPTION

DU/PA	Multimedia/Acid Rain
TASK #	N30
PO	Milliken
DATE	06/21/83
MATRIX	Program Office

itle: Advanced Utility Simulation Model

bjective: This project will produce an advanced simulation model of the electric utility industry. This model will be fully operational, documented, and running on the EPA computer. By using detailed data bases on electric utility generating units and coal reserves, the model will simulate current and future utility industry behavior and operating practices. The model will be transparent to users, explainable and dependable, and will provide policy analysts with a valuable analytical tool.

tionale: The electric utility industry is clearly the major source category for acid deposition precursor emissions and must be considered in any effort to evaluate alternative control strategies to mitigate acid deposition. Due to the complexity of the source category, a computer model is needed to anlayze the impacts of alternative control trategies.

imary User: Interagency Task Force on Acid Precipitation

Secondary User: Office of Air Noise & Radiation

nefits/Uses: The outputs of the project will be used by researchers and policy analysts vestigating the acid deposition issue. The primary benefit will be identification of e most cost-effective control strategy.

tractor: University of Illinois

tract #: CR808514-03-1

FY 84 R&D $ 400K

$ to Complete 100K (FY85)

AUSM - FY84 DETAILED TASK LIST

University of Illinois Project Office (Stukel, Badger)

STATE-LEVEL TASKS

- 0 Complete analytical, programmer, and model maintenance documentation of the state-level AUSM
- 0 Expand report generators for all modules in state-level AUSM
- 0 Develop a state-level scenario generator
- 0 Improve efficiency of the state-level model
- 0 Continue sensitivity analyses of the state-level AUSM
- 0 Expand and refine report options
- 0 Develop professional quality graphic output
- 0 Develop a user's workshop for training AUSM users to operate the AUSM on EPA's computer
- 0 Adapt AUSM to deal with effluent charges--Transferable Discharge Permits
- 0 Integrate and test all new and revised code provided by module developers. This will include:
  - 0 new LIMB models developed by Ed Rubin
  - 0 dry FGD models revised by Ed Rubin
  - 0 new models developed by Ed Rubin to allow switching from high- to low-sulfur oils
  - 0 new least-emissions merit-order dispatch module developed by Sarosh Talukdar
  - 0 a least-emissions l.p. dispatching module revised by Sarosh Talukdar to include least-emissions of TSP and NO_x
  - 0 new l.p. dispatching routine developed by Sarosh Talukdar for the simultaneous least-emissions dispatch of coal-fired plants and least-cost dispatch of non-coal plants
  - 0 demand module revised by Tim Mount to correct anomolies
  - 0 the revised Finance module that was received from Duane Chapman after the Year 3 AUSM was completed
  - 0 Finance module revised by Duane Chapman address alternate taxation and regulatory policies

NATIONAL MODEL DEVELOPMENT TASKS

- Assist Sarosh Talukdar in the design of the regional modules and in the establishment of coding standards for these modules
- Expand AUSMR, the report generator, to include summary reports across states
- Develop all necessary interface programs between the regional modules and the energy and employment impacts module
- Develop all necessary interface programs between the regional modules and the state-level AUSM
- Modify energy and employment module where necessary to meet URGE software standards and to assure portability
- Prepare analytical, programmer, and model maintenance documentation
- Carry out testing, validation, and debugging of the national model

Carnegie-Mellon (Sarosh Talukdar)

STATE-LEVEL TASKS

- Complete analytical, programmer, and model maintenance documenation of the state-level AUSM
- Examine feasibility of starting l.p. dispatch with last year's generation levels, where known, in order to reduce the number of iterations in the dispatch routine
- Implement least-emissions dispatch of TSP and NO_x emission in AUSM
- Implement simultaneous least-emissions dispatch of coal-fired plants and least-cost dispatch of non-coal plants
- Develop a least-emission merit order routine

NATIONAL MODEL DEVELOPMENT TASKS

- Develop regional planning modules
- Develop regional module outputs which provide the following information for each state within the region for each simulation time period:
  - emission caps for TSP, SO_2, and NO_x
  - transfers of electrical energy into or out of the state
  - state-level target fuel choices
  - state-level target plant building mixes
  - state-level target plant conversions and/or retirements
  - plant-level caps for each pollutant for each aggregated plant category in each state
- Provide for additional constraints in regional l.p. formulation, e.g., use for uncertainty analysis
- Develop subroutines to aggregate plants in the plant inventory into proper categories for input to the regional model
- Transfer regional planning modules to Project Office
- Prepare analytical, programmer and model maintenance documentation
- Carry out testing, validation and debugging of the regional module

STATE-LEVEL TASKS

- Complete analytical, programmer, and model maintenance documenation of the state-level AUSM
- Correct demand module anomolies in state-level model
- Recalculate inputs to demand module to reflect most recent BEA statistics

NATIONAL MODEL DEVELOPMENT TASKS

- Implement procedures for
  - specifying the demand in each state for each period and i-th subperiod in the national model
    - prepare a subroutine that is compatible with the regional model to calculate the required energy demands
    - provide default values for the energy demands
  - linking the national-level demand formulation to the energy and employment impacts module
  - disaggregating demand from the regional demand regions to the state level
- Transform NERC information into regional data
- Prepare subroutine to translate national energy demand scenario parameters into state and/or regional growth rates
- Prepare subroutine to translate national economic information (employment, income, and population) into state-level information
- Prepare analytical, programmer and model maintenance documentation
- Carry out testing, validation and debugging of the national model

Carnegie-Mellon (Edward Rubin)

STATE-LEVEL TASKS

- Complete analytical, programmer, and model maintenance documentation of the state-level AUSM
- Implement and test models of a dry FGD system
- Implement and test models of a LIMB system
- Develop new models to allow switching from high to low sulfur oils at oil-fired power plants, using an existing fuel supply data base
- Examine the feasibility of adapting the control module to implement regional emission reduction strategies as well as unit specific policies

NATIONAL MODEL DEVELOPMENT TASKS

- Implement procedures for
  - providing costs, efficiencies and other characteristics of a limited number of pollution control technologies for each state and period
- Prepare analytical, programmer, and model maintenance documentation
- Carry out testing, validation and debugging of the national model

STATE-LEVEL TASKS

- Complete analytical, programmer, and model maintenance documentation of the state-level AUSM
- Examine the linkage between new debt and its effect on the interest rate and revenue requirement in AUSM

STATE-NATIONAL MODEL LINKAGES

- Modify the financial module to address alternate taxation and regulatory policies affecting air pollution control

NATIONAL MODEL DEVELOPMENT TASTS

- Prepare analytical, programmer and model maintenance documentation
- Carry out testing, validation and debugging of the national model

University of Illinois (Clark Bullard)

STATE-LEVEL TASKS

- Complete analytical, programmer, and model maintenance documentation of the state-level AUSM
- Examine changes to criteria used to simulate utility coal selection
- Transfer coal supply module (without depletion capabilities) to EPA
- Adapt capacity planning module to deal with future plant construction as well as unit construction
- Review 23 plant technology types currently in capacity planning for possible reduction of the list

STATE-NATIONAL MODEL LINKAGES

- Implement economically based plant conversion and retrofit criteria used for the national model
- Investigate the linkages between pollution control and capacity planning to deal with criteria for selecting plants for early retirement

COAL SUPPLY MODEL DEVELOPMENT TASKS

- Implement mine cost equations that explicity treat cost as a function of seam thickness
- Analyze effect of minemouth cost uncertainty and depletion, and use this information to define the number of steps on coal supply curve that need to be modeled
- Develop and implement code to transform general optimization problem into standard transportation problem for coal allocation
- Develop and implement code to solve the coal allocation problem
- Develop and implement programs to analyze outputs of allocation problem and disaggregate results based on analysis of rents
- Interact with ANL transportation group on coal transportation network
- Prepare analytical, programmer, and model maintenance documentation
- Carry out testing, validation, and debugging of coal supply model

University of Illinois (Clark Bullard)

NATIONAL MODEL DEVELOPMENT TASKS

- Implement procedures for
  - providing cost, availability, heating value and pollution content of a limited number of coals for each state and each period
  - providing coal prices at regional level
  - providing costs and other characteristics of a limited number of classes of generating plants in each state and for each period. This will include data on the unit cost, performance and available capacities of convertible oil- and gas-fired plants in each state
  - providing capacities of transmission lines between demand regions and their transmission efficiencies
- Interface with ANL on the plant retirement criteria study
- Review and evaluate county level weighting factors developed by ORNL for siting, modify these factors as necessary for the AUSM
- Develop an accounting method for capital costs associated with a multi-state, multiperiod plan
- Prepare analytical, programmer and model maintenance documentation
- Carry out testing, validation and debugging of the national model

AUSM Selected Accomplishments

1. Draft final documentation for state level AUSM received in January 1984. Includes analytical documentation, appendices on unit inventory and coal reserves data base, and methodology used for coal cleaning analysis.

2. Analysis of HR3400 for 4-state region (Ohio, West Virginia, Pennsylvaia, and New York) conducted, and presented to User's Group in December 1983.

3. Analysis of least-emissions dispatching scenario for 12-state Northeastern U.S. region (computer runs completed in 1 week, analysis of results in progress).

4. Analysis of Senate Emission Reduction Bill (S-3041) for West Virginia conducted and presented to User's Group in October 1983.

5. Multi-period, multi-state national level AUSM design document completed in September 1983.

AUSM Areas Requiring Management Attention

1. Program offices (e.g., OPA, ORD) and other users (e.g., states of Minnesota, New York, and Florida, and Environment Canada) have requested access to AUSM documentation as well as requested EPA to conduct model runs. This activity is likely to grow. Should a separate initiative to support these needs be prepared?

2. Further enhancements to AUSM (e.g., capability to analyze transferable discharge permits) will be required to deal with new policy options. Should a funding initiative be submitted to support these needs?

3. Further independent model review and assessment is needed to accomplish quality assurance goals recommended by peer review committees. Should a funding initiative be submitted?

FY 84 R&D TASK DESCRIPTION

DU/PA: Multimedia/Acid Rain
TASK #: N38
PO: Milliken
DATE: 06/21/83
MATRIX: Program Office

Title: Identify and Evaluate Major Factors Affecting Retirement Ages for Energy Facilities

Objective: A retirement decision model will be constructed based on those retirement factors which are deemed to be most important. A literature survey of current analytical capabilities available to project retirement ages will be conducted along with development of a data base of announced retirement plans. The model will be exercised to determine the impact of retirement on acid deposition precursor emission rates.

Rationale: Great uncertainty exists in attempts to project future emission rates for acid deposition precursors. A major factor which produces this uncertainty is the lack of an established methodology for estimating the retirement age of major emitting facilities. This project is necessary in order to remove some of this uncertainty.

Primary User: Interagency Task Force on Acid Precipitation

Secondary User: Office of Air Noise & Radiation

Benefits/Uses: The outputs of this project will be used by researchers and policy analysts investigating the acid deposition issue. The primary benefit will be identification of the most cost-effective control strategy.

Contractor: Argonne National Lab.
Contract #: To Be Determined

FY 84 R&D $: 60K
$ to Complete: -0-

Analysis of Retirement Ages - Accomplishments

1. Initiated Interagency Agreement project with Argonne National Laboratory to conduct retirement age study for electric utility boilers, and to apply results of study to AUSM.

2. Completed and reviewed a work plan for retirement age analysis to supplement AUSM.

3. Work plan reviewed by URGE (Bullard).

4. Coordinated ANL project personnel with URGE staff.

Analysis of Retirement Ages -

Areas Requiring Management Attention

1. Assumptions about utility boiler retirement ages, refurbishment schedule, and derating history can have a significant effect on total emissions, and on economic impacts of control programs. The current funding for the ANL program may not be adequate to address this complex issue. Should an initiative to upgrade this project be prepared?

2. The current retirement age study addresses only the utility sector. Retirement ages of industrial sources and mobile sources are also important parameters. Should the project be expanded to include these source categories?

FY 84 R&D TASK DESCRIPTION

DU/PA	Multimedia/Acid Rain
TASK #	N32
PO	Mobley
DATE	06/21/83
MATRIX	Program Office

Title: Industrial Combustion Emissions Model for SO_x and NO_x

Objective: The objective of this project is to develop an analytical tool to assess the cost and effectiveness of alternative acid deposition control strategies relative to control of NO_x and SO_x emissions from industrial boilers, industrial process heaters, and industrial processes.

Rationale: The industrial combustion sector is second in importance only to the utility sector with respect to acid deposition precursor emissions. Therefore, it is imperative to be able to access the impacts and the emission reduction potential of controlling this sector.

Primary User: Interagency Task Force on Acid Precipitation

Secondary User: Office of Air Noise & Radiation

Benefits/Uses: Outputs of this project will be used by researchers and policy analysts investigating acid deposition control alternatives. Primary benefits will be identification of the most cost-effective control strategy.

Contractor: Energy & Environmental Analysis

Contract #: 68-02-3930

FY 84 R&D $ 300K

$ to Complete 150K (FY85)

Industrial NO_x/SO_x Emission Modeling

Accomplishments

1. Completed "Development of an Industrial Combustion Emissions (ICE) Model for Acid Rain Analyses" Draft Task 1 Report, 02/83, EEA Contract No. 68-02-3930.

2. Effective Use of ICE Model Technical Advisory Committee consisting of EPA (R&D, Policy, and Regulatory), DOE (Fossil Energy, Policy, EIA,ERA), National Lab, and contractor personnel.

3. Award of a Cooperative Agreement to the University of Iowa on "Applications of Discrete Choice Analysis to Environmental Policy Problems."

4. Approval of a Memorandum of Agreement between EPA and DOE to allow access to confidential data on industrial boilers for development of the "Fuel Choice Decision Module."

5. Acceleration of the industrial sector modeling by contract modification to cover NO_x and SO_x emissions from industrial processes and process heaters.

6. Modified IFCAM to become the ICE Model by:

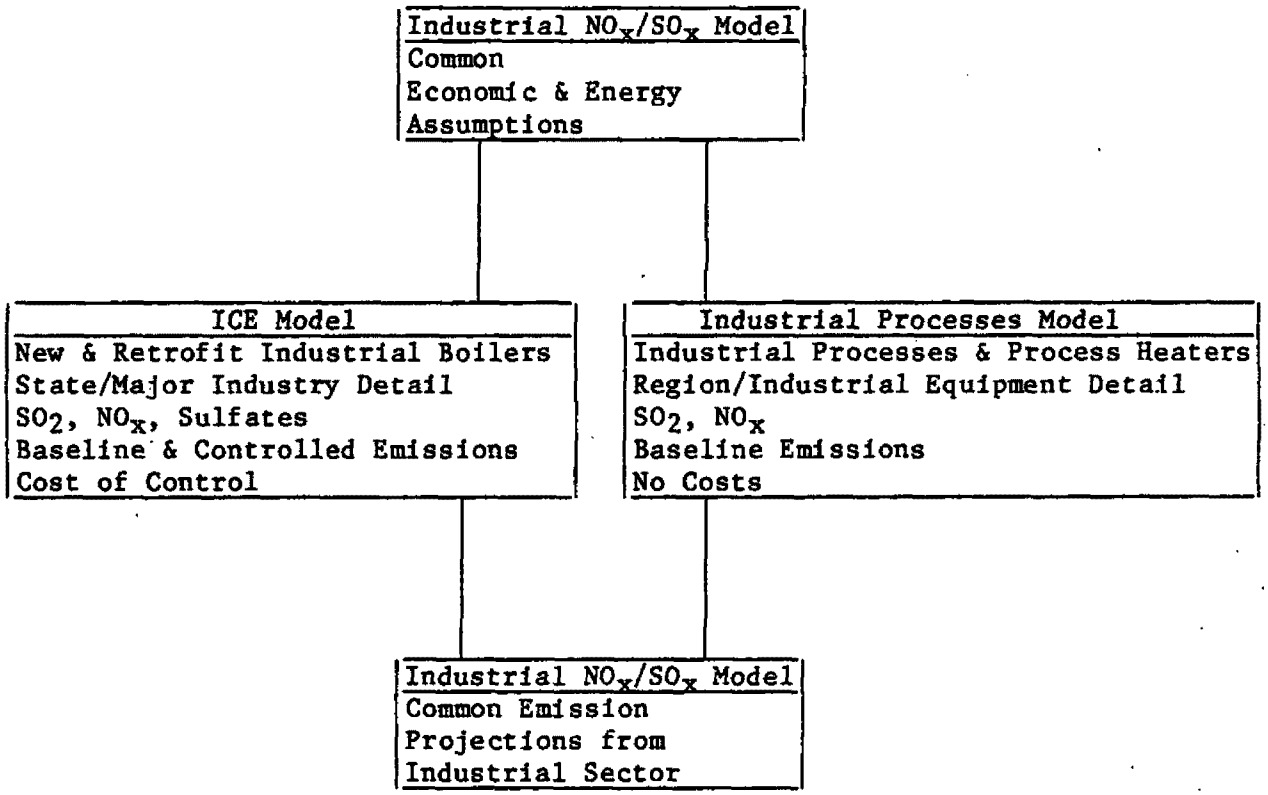
   - o Adding State level resolution
   - o Adding sulfate emission prediction capability
   - o Adding projection capability to 2000
   - o Adding capability for evaluating cost and emission reduction potential of retrofit control strategies for industrial boilers

7. Coordinated with other involved contractors including Pechan, Radian, Argonne, University of Illinois, and University of Iowa.

Proposed Framework

for

Industrial NO_x/SO_x Emissions Model



Industrial NO_x/SO_x Modeling Areas Needing Management Attention

1. The ICE Model is being developed to determine generic costs and emission reduction potential of alternative control strategies for new and retrofit controls on industrial boilers. This technique does not identify the cost of controlling specific plants. Is this approach adequate?

2. The industrial processes model is currently being developed to project emissions by industry group within a region. Is it necessary to develop a sophisticated prediction capability to the state level? Should a funding initiative be submitted in this regard?

3. The industrial processes model is currently being developed to predict emissions but does not have the capability for analysis of cost of control options. Is this approach adequate?

FY 84 R&D TASK DESCRIPTION

DU/PA	Multimedia/Acid Rain
TASK #	N39
PO	Mobley
DATE	06/21/83
MATRIX	Program Office

Title: Industrial VOC Emissions Model

Objective: The objective of the project is to develop an analytical tool to access the cost and effectiveness of alternative acid deposition control strategies relative to control of VOC emissions from industrial processes.

Rationale: VOC emissions from the industrial sector are thought to play a critical role in the formation mechanisms leading to acid deposition. Therefore, it is necessary to be able to predict future VOC emission levels and the impact of alternative regulatory options on the industrial sector and on emission levels.

Primary User: Interagency Task Force on Acid Precipitation

Secondary User: Office of Air Noise & Radiation

Benefits/Uses: Outputs of this project will be used by researchers and policy analysts investigating acid deposition control alternatives. Primary benefits will be identification of the most cost-effective control strategy.

Contractor: To Be Determined

Contract #: To Be Determined

FY 84 R&D $ 90K

$ to Complete 200K (FY85)

Industrial VOC Emission Modeling

Accomplishments

1. Completed scoping study on industrial VOC emissions in 10/83 (Schwengels/Pechan).

2. Assessed available analytical techniques for VOC emission modeling and determined that none were adequate.

3. Initiated development of model framework with Radian Corporation in 01/84.

4. Coordinated with involved parties including Radian, Pechan, Argonne, Engineering Science, GCA, EEA, and OAQPS.

Industrial VOC Modeling Areas Requiring Management Attention

1. The US/Canadian Work Group 3B report indicated that the industrial VOC source emissions were almost half of VOC emisions, and an industrial VOC modeling project was initiated. Further investigation using the NECRMP data base indicated only about 25% of VOC emissions was from the industrial sector and that about 25% was from the commercial sector.

	% of VOC Emissions	
	WG3B	NECRMP
Industrial Sources	48	25
Utility Sources	5	1
Transportation	34	38
Other	13	--
Commercial/Other	--	36
	100	100

DOE has the lead role for emission modeling from the commercial, residential, and transportation sectors. Hence, the issue emerges as to whether VOC emissions will be handled properly by the current approach. Specifically, should DOE or EPA have responsibility for all VOC emission modeling, or should EPA and DOE split the responsibility in some manner?

2. In the "Acid Precipitation Task Force Paper," it was noted that there was a fair amount of regulatory activity underway in the industrial VOC category and that it did not seem reasonable to consider additional VOC control strategies as part of an acid deposition control strategy. Is this still considered a reasonable approach (i.e., is it necessary to build cost of additional and/or retrofit VOC control into the industrial VOC model)?

	VOC Regulatory Actions*		
Type	Existing	Under Development	Total
NSPS	6	19	25
NESHAPS	1	7	8
CTG	21	8	29
	28	34	62

*As of 06/83

Control Technology - Task Group H

- o Goal: Evaluate cost, performance, and applications of techniques for control of acid deposition precursor emissions.

- o Specific Objectives:

  - Develop engineering cost and performance data for SO_2 and NO_x controls on fossil fuel combustion sources

  - Evaluate technologies for control of precursor emissions other than SO_2 and NO_x

  - Evaluate technologies for control of precursor emissions from industrial processes

- o Budget Summary: FY82 - $0K; FY83 - $0K; FY84 - $0K; FY85 - $600K

- o NAPAP Role and Coordination: Provide state-of-the-art control technology cost and performance assessment data needed for the NAPAP policy analysis and assessment program. Control technology assessment data used by Task Groups I and B.

- o Task Group H Staffing:

  - Management. Program planning and budgeting conducted by Chairman F. T. Princiotta with direct support from IERL management (E.L. Plyler, M.A. Maxwell) and operating staff (J.O. Milliken, J.D. Mobley).

  - Program Implementation. FY85 program to be administered by IERL's Utilities and Industrial Processes Division, Emissions/Effluent Technology Branch. Designated project officers for FY85 projects are J. Milliken and D. Mobley.

  - Steering Committee Function. Provided by full membership of Task Group H which includes representatives from EPA, TVA, and DOE.

Task Group H's Projects and Budget Summary

	FY84	FY85
Potential Role of Coal Cleaning for Additional SO_2 Reduction	$250K*	$300K*
Assessment of Current SO_2 and NO_x Control Technologies		200K
Control of Directly Emitted Acidic Materials		100K
Technology Combinations and Modifications for Moderate SO_2 Control at Low Cost		100K
Evaluation of Passive (Non-Hardware) Control Options		200K
Technical and Economic Evaluation of LIMB		100K*
Assessment of the Adequacy of VOC Control Techniques		100K*
Assessment of Control Technologies for Industrial Processes		200K*
Base Budget	0	600K
Supplements	250K*	700K*
Total	$250K	$1300K

*Not Funded

TASK GROUP H MAJOR DELIVERABLES

Major Deliverables	Year Expected	Needed by Task Group	Contributes to: Objective	Contributes to: Assessment (Year)
Assessment of the Merits of Coal Cleaning as a Control Option	FY85	I	1	85
State-of-the-Art Report on SO_2 and NO_x Controls for New and Retrofit Applications on Combustion Sources	FY85	B	1	87
Report on the Adequacy of Techniques for Control of Directly Emitted Acidic Materials (Sulfates & Chlorides)	FY86	B, I	2	87
Assessment of Technology Combinations and Modifications for Moderate Control at Low Cost	FY86	B, I	1	87
Evaluation of Passive (Non-Hardware) Control Options Such as Load Dispatching, Fuel Switching, Conservation, Bubbling, and Early Retirements	FY86	B, I	1	87
Conduct a Technical and Economic Evaluation of LIMB as a Control Option	FY87	B, I	1	87
Report on the Adequacy of VOC Emission Control Techniques	FY87	B	3	87
Report on Assessment of Control Techniques for Industrial Processes	FY87	B	3	87
Site-Specific Assessment Report on Control Options for Major Sources	FY88	B, I	1, 2, 3	89
State-of-the-Art Report on Control Technologies	FY88	B, I	1, 2, 3	89

Task Group H - Areas Requiring Management Attention

1. The FY84 supplement of $250K to initiate the coal cleaning assessment study is no longer viable. Should an FY85 supplement be submitted to accommodate this important study or should this be a priority item on the FY86 budget proposal for Task Group H?

2. Recent EPA Headquarters requests for control technology cost and performance data on selected fuel switching techniques have pointed out our lack of capability to quickly respond with credible information in this area. Information is either insufficient or nonexistent in the following areas: (1) Capital investment cost impacts and boiler performance problems (e.g., derating) associated with conversion of high sulfur coal-fired boilers to low sulfur coal; (2) cost premium for low sulfur oil relative to currently fired high sulfur residual oil being used in numerous northeastern U.S. utility boilers; and (3) capital investment, boiler performance effects, and fuel price premiums associated with adding natural gas firing capability to existing coal-fired boilers. The lack of supportable engineering data in these areas greatly reduces our capability to provide current and near-term support to EPA policy and regulatory analysis needs, as well as long-term support for NAPAP assessments. What approach should be taken to fill these data gaps?

3. Major opportunities for the development of significantly lower cost approaches to control of acid deposition precursor emissions are not being exploited because of the lack of fundamental bench-scale characterization of novel concepts. For example, preliminary data indicate good potential for charged sorbent droplets to achieve concurrent SO_2 capture and enhanced particulate capture in existing ESPs. Development and commercialization of this concept could have tremendous implications in reducing the overall cost of a retrofit control program to reduce SO_2 emissions. Although we are planning to address this need in the Task Group H FY86 budget proposal, should an initiative be submitted for a possible FY85 supplement to support this activity.

4. Methods and costs of reducing emissions from non-industrial non-utility sources are not well characterized (e.g., further NO_x reduction from auto, VOC reduction from commercial sources). Should Task Group H expand scope in FY86 program?

Project Descriptors for Task Group H Program

The following Project Descriptors, which describe the FY85 Level I, II, and III, and FY84 Supplement Projects, are attached:

(1) Potential Role of Coal Cleaning for Additional SO_2 Reduction

(2) Assessment of Current SO_2 and NO_x Control Technologies

(3) Control of Directly Emitted Acidic Materials

(4) Technology Combinations and Modifications for Moderate SO_2 Control at Low-Cost

(5) Evaluation of Passive (Non-Hardware) Control Options

(6) Technical and Economic Evaluation of LIMB

(7) Assessment of the Adequacy of VOC Control Techniques

(8) Assessment of Control Techniques for Industrial Processes

I. DESCRIPTIVE TITLE: POTENTIAL ROLE OF COAL CLEANING FOR ADDITIONAL SO_2 REDUCTION

NAPAP Code: H1-1

Funding Agency: EPA

Project Officer: John O. Milliken
Industrial Environmental Research Laboratory
U.S. Environmental Protection Agency (MD-61)
Research Triangle Park, NC 27711
919-541-7716
FTS/629-7716

Period of Performance: Begin: October 1983; End: September 1984

Funding: FY85 - Supplement - $250K (?); FY86 - $300K

Priority Ranking Within Task Group: 1

II. IMPORTANCE: There is an increasing interest in the possible use of coal cleaning for achieving additional SO_2 reductions, primarily from utility coal combustion. However, there is considerable uncertainty concerning the potential SO_2 reductions which can be achieved by additional coal cleaning. Additionally, information is needed on the costs of cleaning at different sulfur removal levels, and on the cost benefits associated with reduced boiler operating and maintenance costs and increases in boiler availability, which result from coal cleaning.

III. SPECIFIC OBJECTIVES:

(1) To provide an assessment of current practice in physical coal cleaning. This assessment will address how much coal is currently being washed and what the costs of this washing are. It will also describe the current status of the coal cleaning industry in terms of the number and type of plants, and plant utilization data. (FY84)

(2) To estimate additional SO_2 reductions possible with physical coal cleaning, and the cost of achieving these reductions. This estimate will be made on a regional and state level, and will address additional SO_2 reductions possible with different levels of cleaning. (FY84)

IV. TECHNICAL APPROACH: Coal preparation plant data will be aggregated on a county, state, and regional level to provide estimates of current coal cleaning practices. These data will be matched with information from data bases on coal cleanability, coal reserves, and coal deliveries to utilities. Engineering studies will be used to provide estimates for the cost of upgrading existing plants and constructing new plants. Improved estimates of cost benefits resulting from coal cleaning will be developed. This project will be coordinated with Canadian control technology researchers who have expressed an interest in coal cleaning as applied to reduction of SO_2 emissions.

Potential Role of Coal Cleaning for Additional SO_2 Reduction (Continued)

V. DELIVERABLES:

(1) Report on the assessment of current coal cleaning practice--by June 1984.

(2) Report on the estimate of additional SO_2 reductions possible with coal cleaning and the cost of achieving these reductions--by September 1984.

VI. RELATIONSHIP TO OTHER WORK: Information developed by this project will be used primarily by Task Groups B and I in assessing the relative costs of various control programs to reduce SO_2 emissions. The coal cleaning information is needed to augment the cost and performance data for other control technologies in order to determine and describe least cost approaches to reductions in SO_2 emissions from coal combustion.

VII. RESULTS AND CONCLUSIONS: The current data base on coal cleaning practice is incomplete and out-of-date. In order to estimate the additional SO_2 reductions possible with increased coal cleaning, an assessment of how much coal is currently washed and at what levels is needed. Although the technical feasibility of achieving an additional 2.5 million tons per yr SO_2 reduction is generally acknowledged, the economic feasibility of additional SO_2 reductions above 1.5 million tons of SO_2 per year is more ambiguous.

I. DESCRIPTIVE TITLE: ASSESSMENT OF CURRENT SO_2 AND NO_x CONTROL TECHNOLOGIES

NAPAP Code: H1-2

Funding Agency: EPA

Project Officer: John O. Milliken
Industrial Environmental Research Laboratory
U.S. Environmental Protection Agency (MD-61)
Research Triangle Park, NC 27711
919-541-7716
FTS/629-7716

Period of Performance: Begin: October 1984; End: September 1985

Funding: FY85 - Level I - $200K

Priority Ranking Within Task Group: 2

II. IMPORTANCE: Any possible control program to reduce emissions of acid deposition precursors would probably focus on control of major existing sources of SO_2 and NO_x, although the control of other precursors (e.g., sulfates, chlorides, and VOC) may be important, especially for deposition associated with local sources. A NAPAP objective is to be able to estimate the effect and cost of possible control programs. To meet with objective, Task Group H will provide control technology cost and performance data for existing state-of-the-art and emerging advanced control technologies.

III. SPECIFIC OBJECTIVE: To develop engineering cost and performance information for current and near-term emerging SO_2 and NO_x control technologies that could be applied to existing and new fossil fuel combustion sources. (FY85)

IV. TECHNICAL APPROACH: Engineering cost and performance data developed for existing and emerging technologies will be adapted by Task Group H for use by the ITFAP in conducting preliminary assessments of possible control programs to reduce emissions of SO_2 and NO_x. The cost and performance data for specific control technologies (viz., lime/limestone FGD, dual alkali FGD, lime spray drying, physical coal cleaning, low NO_x burners, LIMB, and coal switching) will be developed in a format suitable as input to the policy assessment models being developed by Task Groups B and I. Cost data provided will include total capital investment, annual operating expenses, annualized and levelized costs, and major factors affecting cost. Existing cost data will be adapted to a uniform format; that is, costing methodology and assumptions will be consistent for each technology addressed. Major variables affecting cost of control technology, with emphasis on cost penalties for retrofit applications, will be described.

V. DELIVERABLES: Report on state-of-the-art SO_2 and NO_x controls for new and retrofit applications to combustion sources--delivered by September 1985.

VI. RELATIONSHIP TO OTHER WORK: The control technology cost and performance data developed by this project has direct application to the assessment models being developed by Task Groups B and I. This information is essential to NAPAP assessments of the cost of possible regulatory programs to control emissions of SO_2 and NO_x from major man-made sources.

VII. RESULTS AND CONCLUSIONS: Current control technology cost and performance data is based primarily on information designed for the control of new sources. This is appropriate for existing air quality regulatory programs. However, this may not be appropriate information for developing least cost control programs for achieving reductions of SO_2 and NO_x emissions called for by possible acid precipitation regulatory programs.

I. DESCRIPTIVE TITLE: CONTROL OF DIRECTLY EMITTED ACIDIC MATERIALS

NAPAP Code: H1-3

Funding Agency: EPA

Project Officer: J. David Mobley
Industrial Environmental Research Laboratory
U.S. Environmental Protection Agency (MD-61)
Research Triangle Park, NC 27711
919-541-2578
FTS/629-2578

Period of Performance: Begin: October 1984; End: September 1985

Funding: FY85 - Level II - $100K

Priority Ranking Within Task Group: 3

II. IMPORTANCE: For directly emitted acidic compounds (e.g., sulfates and chlorides), very little information is available on the type and effectiveness of control techniques that could be used to reduce these emissions. These emissions could be very significant in determining the local vs long range transport/deposition issue. If it is determined through other components of the NAPAP program that directly emitted acidic materials are significant contributors to acid deposition, then assessments of control strategies to reduce these emissions will be needed. Because the technology and associated costs of reducing directly emitted acidic materials will not be the same as controlling precursors such as SO_2 and NO_x, the type, cost, and mix of control technologies employed in a strategy to reduce acid deposition will also be substantially different.

III. SPECIFIC OBJECTIVES: To identify and evaluate the adequacy of controls for reducing sulfates and chlorides and to quantify the relative importance of directly emitted acidic materials. The performance and cost of control technologies to reduce emissions of sulfates and chlorides will be described.

IV. TECHNICAL APPROACH: Available information on the effectiveness of controls for reducing sulfates and chlorides is limited. The approach to developing this information for NAPAP purposes will be to review and analyze existing data for sulfate and chloride reduction efficiencies as determined on full-scale sources. Additionally, pilot- and laboratory-scale data may be used to adapt control efficiency information where needed.

V. DELIVERABLES: Report on the adequacy of controls for reducing emissions of sulfates and chlorides from fossil-fuel combustion sources and industrial processes--by September 1985.

VI. RELATIONSHIP TO OTHER WORK: Information developed by this project will be provided to Task Group B for direct use in the sectoral models that predict emission trends and cost of possible control programs.

VII. RESULTS AND CONCLUSIONS: For directly emitted acidic compounds such as sulfates and chlorides, very little information is available on the effectiveness of conventional control technologies. The significance of these sources in terms of acid deposition impacts is also largely unknown, and constitutes a major research question for other components of the NAPAP.

I. DESCRIPTIVE TITLE: TECHNOLOGY COMBINATIONS AND MODIFICATIONS FOR MODERATE SO_2 CONTROL AT LOW-COST

NAPAP Code: H1-4

Funding Agency: EPA

Project Officer: J. David Mobley
Industrial Environmental Research Laboratory
U.S. Environmental Protection Agency (MD-61)
Research Triangle Park, NC 27711
919-541-2578
FTS/629-2578

Period of Performance: Begin: October 1984; End: September 1985

Funding: FY85 - Level II - $100K

Priority Ranking Within Task Group: 4

II. IMPORTANCE: Existing technology to control acid deposition precursors emitted from coal-fired utility boilers is expensive. Engineering research and development by EPA has identified low-cost applications of "scaled-down" FGD, and a number of advanced control technologies that can be integrated into low-cost control systems. For example, coal preparation integrated with limestone injection multi-stage burners or post-combustion lime spray dryers has the potential to provide multi-pollutant control at low-cost. Additionally, recent developments in low-cost particulate control including precharging and large diameter electrodes and electrostatically augmented fabric filtration need to be coupled with advanced SO_2 control concepts (e.g., LIMB or lime spray drying) to investigate low-cost integrated control systems.

III. SPECIFIC OBJECTIVES: To evaluate the cost and performance of innovative and integrated approaches to SO_2 control for possible acid deposition control strategies--by September 1985.

IV. TECHNICAL APPROACH: A number of concepts for combined control systems being investigated under other EPA programs (e.g., integrated air pollution control systems) will be identified as potential candidates for retrofit to coal-fired boilers for an acid deposition control program. These combinations would include, for example, coal cleaning with LIMB, LIMB with spray drying, and simultaneous NO_x/SO_x control. Additionally, this project will identify and describe the theoretical costs and performance of modified conventional control systems. For example, a low-cost lime/limestone FGD to give moderate (50-70 percent) SO_2 reduction may be an appropriate control approach for a retrofit based control program. Additionally, flue gas conditioning to restore fly ash resistivity properties needed for removal with electrostatic precipitators will be investigated for coal switching.

V. DELIVERABLES: Report on the cost and performance characteristics of selected technology combinations and low-cost, moderate control technology modifications--by September 1985.

VII. RESULTS AND CONCLUSIONS: Existing, NSPS-type control technology to reduce SO_2 is very expensive. Combinations of technologies or modifications of existing control technologies may lead to a more cost-effective approach to controlling emissions of SO_2 for an acid deposition control program.

I. DESCRIPTIVE TITLE: EVALUATION OF PASSIVE (NON-HARDWARE) CONTROL OPTIONS

NAPAP Code: H1-5

Funding Agency: EPA

Project Officer: John O. Milliken
Industrial Environmental Research Laboratory
U.S. Environmental Protection Agency (MD-61)
Research Triangle Park, NC 27711
919-541-7716
FTS/629-7716

Period of Performance: Begin: October 1984; End: September 1985

Funding: FY85 - Level II - $200K

Priority Ranking Within Task Group: 5

II. IMPORTANCE: Most control strategies being considered for use in a possible acid deposition regulatory program consist of both control technology hardware and passive or non-hardware approaches to reducing emissions of acid deposition precursors. The evaluation of hardware technologies (e.g., wet scrubbing, lime spray drying, and LIMB) is straightforward in terms of assessing emissions reduction performance and engineering cost. Passive control options which include least emissions load dispatching, fuel switching, conservation, bubbling, and early retirement are more difficult to evaluate in terms of emissions reduction relative to a non-control baseline, and especially in terms of assessing the cost impact. In order to be able to assess the emission reduction and cost impacts of passive options on the same basis as the hardware control technology approaches, an engineering evaluation of the implementation of the various passive control options is needed. In general, the passive control options are perceived to be lower cost control approaches, and hence they are viewed as playing a major role in any possible regulatory program to reduce emissions of acid deposition precursors. Therefore, assessment of the cost and other impacts of passive controls is important to achieving the NAPAP Task Group H goal of evaluating control technology.

III. SPECIFIC OBJECTIVE: To develop engineering cost and performance information for passive (non-hardware) control options for reducing emissions of acid deposition precursors. The passive control options evaluated will include load dispatching, fuel switching, conservation, bubbling, and early retirement.

IV. TECHNICAL APPROACH: A complete list of passive or non-hardware options will be developed and each of these options will be described in detail. The implementation problems anticipated for each passive control option will be identified. For example, the effect of fuel switching on boiler capacity and operating conditions will be evaluated, and a cost impact of these factors will be estimated. Hidden cost penalties associated with passive options such as load dispatching and early retirement will be identified and guidelines for estimating the quantitative value of these cost estimates will be provided. The cost data developed for each of the passive control options will detail a list of major equipment items required, the total capital investment for these equipment items, additional annual operating expenses associated with passive controls, and the annualized and levelized costs. Additionally, major factors affecting these costs on a site-specific basis will be identified. Cost data will be adapted to a uniform format.

Evaluation of Passive (Non-Hardware) Control Options (Continued)

V. DELIVERABLES: Report that describes the cost and performance of passive control options for both new and retrofit applications to utility and industrial power generation sources--delivered by September 1985.

VI. RELATIONSHIP TO OTHER WORK: Control technology cost and performance data developed by this project has direct application to the assessment models being developed by Task Groups B and I. This cost information is essential to NAPAP assessments of the cost of possible regulatory programs to control emissions of SO_2 and NO_x from major man-made sources.

VII. RESULTS AND CONCLUSIONS: An engineering evaluation of the cost and performance of passive control options such as load dispatching, fuel switching, conservation, bubbling, and early retirement has not been conducted. This type of cost and performance data needs to be put on an equivalent basis with the engineering assessment data for hardware control technology options. The cost data are particularly important as inputs to NAPAP sectoral models that support policy analysis.

I. DESCRIPTIVE TITLE: TECHNICAL AND ECONOMIC EVALUATION OF LIMB

NAPAP Code: H1-6

Funding Agency: EPA

Project Officer: John O. Milliken
Industrial Environmental Research Laboratory
U.S. Environmental Protection Agency (MD-61)
Research Triangle Park, NC 27711
919-541-7716
FTS/629-7716

Period of Performance: Begin: October 1984; End: September 1985

Funding: FY85 - Level III - $100K

Priority Ranking Within Task Group: 6

II. IMPORTANCE: Simultaneous control of SO_2 and NO_x with limestone injection multi-stage burners is viewed as a promising technology to cost-effectively reduce emissions of these acid deposition precursors. However, the current data base for cost and performance characteristics of this technology is limited to third party (EPRI/Combustion Engineering and DOE/Gilbert) preliminary studies. Because of the potential cost savings of this technology, the NAPAP assessment program should have available the most accurate and up-to-date engineering cost data for LIMB. Additionally, the potential impact on boiler performance in terms of derating and the effect of LIMB on particulate control requirements needs to be assessed for the NAPAP program.

III. SPECIFIC OBJECTIVE: To conduct an engineering assessment of the technical and economic aspects of retrofitting LIMB systems to existing coal-fired boilers--by September 1985.

IV. TECHNICAL APPROACH: Preliminary cost estimates for retrofit of LIMB systems on various boiler types (e.g., wall-fired, tangential-fired) will be conducted. The impact of sorbent injection at the burner on boiler performance and availability will be reviewed and analyzed. Additionally, the effect of LIMB on particulate control system requirements will be assessed.

V. DELIVERABLES: Report on the technical and economic evaluation of retrofitting LIMB to existing coal-fired boilers--by September 1985.

VI. RELATIONSHIP TO OTHER WORK: The cost and performance data developed under this task will be used directly by Task Group B in the sectoral models that project emission trends and costs of various control programs. Additionally, the potential savings associated with a successful LIMB development program, is information that will be important to policy analysis and assessment activities of Task Group I.

VII. RESULTS AND CONCLUSIONS: Current cost and performance data for commercial applications of LIMB technology are limited. Major unknowns relate to impact of technology on boiler performance and availability, as well as the effect of LIMB on particulate control system requirements.

I. DESCRIPTIVE TITLE: ASSESSMENT OF CONTROL TECHNIQUES FOR INDUSTRIAL PROCESSES

NAPAP Code: H1-8

Funding Agency: EPA

Project Officer: J. David Mobley
Industrial Environmental Research Laboratory
U.S. Environmental Protection Agency (MD-61)
Research Triangle Park, NC 27711
919-541-2578
FTS/629-2578

Period of Performance: Begin: October 1984; End: September 1985

Funding: FY85 - Level III - $200K

Priority Ranking Within Task Group: 8

II. IMPORTANCE: Industrial processes such as non-ferrous smelting and iron and steel manufacturing represent significant sources of acid deposition precursors (especially SO_2 and NO_x) in some regions. Control technology assessment data on emissions reduction performance and cost will be needed to support sectoral models that will be used to integrate industrial processes into the overall policy analysis of acid deposition control strategies.

III. SPECIFIC OBJECTIVES: To identify appropriate industrial processes control technologies, and to provide performance and cost assessment data for these processes.

IV. TECHNICAL APPROACH: On the basis of NAPAP emission inventory data for industrial processes, control technologies relevant to the significant industrial process emitters of acid deposition precursors will be identified and studied. Existing cost and performance data for these control technologies will be adapted to the specific source categories. Cost data provided will include total capital investment, annual operating expenses, annualized and levelized costs, and major factors affecting cost. Existing cost data will be adapted to a uniform format.

V. DELIVERABLES: Report on state-of-the-art controls for application to new and retrofit sources of acid deposition precursor emissions from industrial processes--delivered by September 1985.

VI. RELATIONSHIP TO OTHER WORK: The control technology cost and performance data developed by this project has direct application to the assessment models being developed by Task Groups B and I. This information is essential to NAPAP assessments of the cost of possible regulatory programs to control emissions from major industrial process sources.

VII. RESULTS AND CONCLUSIONS: Current control technology cost and performance data is based primarily on information designed for the control of new sources. This is appropriate for existing air quality regulatory programs. However, this may not be appropriate information for developing least cost control programs for achieving reductions of emissions called for by possible acid precipitation regulatory programs.

I. DESCRIPTIVE TITLE: ASSESSMENT OF THE ADEQUACY OF VOC CONTROL TECHNIQUES

NAPAP Code: H1-7

Funding Agency: EPA

Project Officer: J. David Mobley
Industrial Environmental Research Laboratory
U.S. Environmental Protection Agency (MD-61)
Research Triangle Park, NC 27711
919-541-2578
FTS/629-2578

Period of Performance: Begin: October 1983; End: September 1984

Funding: FY85 - Level III - $100K

Priority Ranking Within Task Group: 7

II. IMPORTANCE: Although the role of volatile organic compounds (VOC) in the acid deposition phenomena is not yet clearly understood, it is felt that VOC may play an important role in the conversion of SO_2 and NO_x to acidic species, especially in some regions. Engineering cost and performance data of a quality suitable to use as input to the NAPAP sectoral models that support policy analysis will be needed in the event that VOC's are determined to play a significant role.

III. SPECIFIC OBJECTIVES: To identify VOC control technologies that would be appropriate for reducing emissions of VOC that are implicated in contributing to acid deposition. Engineering cost and performance data for each of the VOC control technologies identified will be developed.

IV. TECHNICAL APPROACH: Identification of appropriate VOC control technologies will depend on the distribution and characteristics of VOC emission sources. This information is planned for development under an associated Task Group B project. When the relevant VOC emission sources have been identified, the engineering cost and performance data will be developed. In most cases, engineering data for VOC control technologies will be available from previous EPA assessments in this area, although this data may have to be adapted for acid deposition related applications.

V. DELIVERABLES: Report on the engineering cost and performance characteristics of VOC control technologies--by September 1985.

VI. RELATIONSHIP TO OTHER WORK: The cost and performance data for VOC control technologies would be used as input into the models currently being developed by Task Group B. These models would be used principally by Task Group I for policy analysis purposes.

VII. RESULTS AND CONCLUSIONS: Engineering data on the cost and performance of VOC control technologies that would be employed by various possible acid deposition control programs has not been developed.

Program Peer Reviews

1. Laboratory Peer Review of Task Group B EPA Projects (April 1983 at RTP)

2. NAPAP Peer Review on Sources, Monitoring, and Atmospheric Research (August 1983 at Boston)

3. Ad Hoc Committee to Review NAPAP (Deutch Panel)

Program Peer Reviews

Laboratory Peer Review of Task Group B EPA Projects (April 1983 at RTP)

- Requested by ORD/OEET as part of ORD Laboratory Peer Review Process for major R&D programs.
- Review coordinated by EETB; ORD protocol for Laboratory peer reviews followed (per Riordan 6/1/82 memo).
- Reviewers: Weyant (Stanford Univ.), Friedman (OTA), Hawkins (NRDC), Richels (EPRI), and Wootten (Peabody).
- Findings: Sectoral models and emission inventories, found to be "at or close to the state-of-the-art."
- Recommendations:
  (1) More emphasis on integration of component models and acceleration of model integration.
  (2) Further independent model assessment and quality assurance..
- Action taken:
  (1) Development of integrated models accelerated (Schwengels/Pechan).
  (2) Independent engineering review of selected AUSM component modules accomplished. Corrective actions taken.
  (3) AUSM User Group and ICE Technical Advisory Committee activities provide additional quality assurance support.
  (4) Increased emphasis on quality assurance in emission inventory.

Program Peer Reviews (continued)

NAPAP Peer Review on Sources, Monitoring, and Atmospheric Research (August 1983 at Boston)

- o Requested by ITFAP. Purpose was to review activities and plans for NAPAP Task Groups on Natural Sources, Man-made Sources, Atmospheric Modeling, and Deposition Monitoring

- o Coordinated by University Corporation for Atmospheric Research (UCAR). Task Group B participation coordinated by DOE (Beecy/Trexler).

- o Reviewers (for TGB): Hidy (ERT), Gordon (Univ. Maryland), Kronenberger (Exxon), McRae (CMU), Melo (Ontario Hydro), Whitby (Univ. Minnesota).

- o Findings (for TGB):

    (1) Quality of Task Group B research judged to be lower than average (2.6/5.0)
    (2) Effective use of available inventories
    (3) Insufficient quality assurance of emissions inventories
    (4) Insufficient attention to VOC, alkaline dusts, ammonia, and trace elements in emissions models

- o Selected Recommendations:

    (1) Improve coordination between Task Groups
    (2) Strengthen research planning, direction, and coordination
    (3) Greater participation of non-federal scientists
    (4) New funding for research to address scientific issues that are critical to policy analysis

- o Action taken:

    (1) Maintained ongoing coordination with other Task Groups (e.g., TGC and TGI)
    (2) Prepared detailed reply to NAPAP.
    (3) Emphasized quality assurance aspects including participation in accuracy workshop.
    (4) Requested additional funding for emission inventory and model validation.

Program Peer Reviews (continued)

Ad Hoc Committee to Review the National Acid Precipitation Assessment Program (Deutch Panel)

- o Requsted by Ruckelshaus, Block, and Byrne "to review and evaluate the technical quality of the national program and suggest further research."

- o Review coordinated by EPA Science Advisory Board and NAPAP Program Coordination Office. Task Group B activities presented at 2 meetings by DOE (with EPA support at 2nd meeting). Task Group H and overall federal control technology R&D program also evaluated.

- o Reviewers: Deutch (MIT), Balzhiser (EPRI), Hidy (ERT), Likens (Institute of Ecosystems Studies), Penner (Univ. Calif. San Diego), Ruderman (Columbia), Galloway (Univ. Virginia), Klemperer (Harvard), Oppenheimer (Env. Denfense Fund), Postma (ORNL).

- o Major Findings Relative to IERL/RTP Program:

    (1) "Control technology is a central component of the acid deposition problem and is currently not included in the NAPAP program."

    (2) "Present NAPAP effort on man-made sources must be strengthened."

- o Corrective Action Anticipated:

    (1) Task Group H program for control technology assessments to receive initial funding in FY85.

    (2) Emissions inventory funding to increase in FY85.

    (3) Plan to request additional support for modeling via FY86 budget proposal.

Peer Review Related Areas Requiring Management Attention

1. Multiple program peer reviews (3 in 10 months) have expended program resources (man-hours, travel, contractor impacts). Can NAPAP and EPA/ORD Laboratory program reviews be coordinated to minimize costly and sometimes redundant effort? Should resources for peer review be included in the Laboratory budgets and operating plans?

2. Given that the April peer review at IERL/RTP seems to have been given limited visibility and credence, is it worthwhile to conduct another of these reviews in September 1984?

3. With respect to Boston review and Deutch panel review, IERL/RTP program was presented in large part by DOE Task Group leadership. How can IERL/RTP be in better position to represent its own R&D program?

4. To ensure effective, high-quality reviews, panels reviewing IERL/RTP program should have membership that represents expertise in control technology, emissions inventory development, and emissions and control strategy models. The EPA ORD Laboratory Peer Review Process guidelines for peer review panel selection give explicit guidelines for identifying and selecting qualitied panel candidates. What can be done to encourage NAPAP to follow similar procedures?

5. The Deutch Review Group has recommended a greatly increased federal R&D program for control technologies to reduce emissions of acid deposition precursors. Although we certainly concur with this recommendation, we strongly disagree with the proposal that DOE (outside of NAPAP) be the focus of the federal control technology research program. EPA's superior record of accomplishment in control the technology R&D area plus EPA's responsibility to protect public health and the environment in the most cost-effective manner indicates that EPA should be the lead federal agency in the control technology area.

Non-NAPAP Acid Deposition Activities

o Elkin's Task Force Activities Supported

Materials on sources and control technologies was submitted and draft sections of the Task Force Report were reviewed and critiqued.

o Coal Cleaning Briefings

A Coal Cleaning Background and Issue Paper was prepared for OAR and ORD. Several briefings on coal cleaning technology were given to EPA/HQ staff (ORD, OAR, OPRM).

o Assessment of Organic Acid Enhanced FGD

Applications of high performance organic-acid-enhanced FGD as part of an acid rain control strategy were analyzed. Several reports have been submitted to OPRM, OAR, and ORD and a R&D plan was prepared to solidify the data base on the technology.

o Design and Analysis of a Cost-Effectiveness Control Strategy

A method to rank order the 100 largest SO_2 emitters in 7 states by cost-effectiveness of deposition reduction was designed. An exercise to demonstrate this technique was conducted with support from ESRL. Results were presented to EPA-HQ staff on September 2, 1983.

o OPRM and ICF Supported

Cost data for flue gas desulfurization data and NO_x controls was prepared and submitted to OPRM. An exercise to compare AUSM with the ICF utility model was initiated. Specific runs have been made on AUSM for this purpose and a meeting with OPRM is planned for February 9.

o Administrator's Briefing Book

Information was prepared to support Ruckelshaus for the 02/02/84 hearings before a Senate committee considering acid deposition issues.

General Areas Requiring Management Attention

1. IERL-RTP has not received adequate personnel, travel, or ADP allocations to support the acid deposition program although considerable resources have been expended to support NAPAP and EPA Program Offices. When will this situation be alleviated and should IERL-RTP take any specific actions in this regard?

2. As the acid deposition program matures, needs tend to become more demanding than was anticipated during budget planning. Thus, more deliverables are requested without more resources being provided. What approach should be taken in this regard?

3. IERL-RTP personnel seem to be held accountable for the NAPAP Task Group B program when we do not have control over all components. What improvements can be made in this regard? What actions should be taken by IERL-RTP, EPA, and NAPAP personnel to improve the effectiveness of the DOE component of Task Group B.

4. The quality vs quantity issue is constantly arising. What approach should be taken recognizing that peer reviewers and potential users (critics) may not appreciate the trade-offs required in this regard.

5. The trend in Task Group B funding indicates an even balance between emission inventory and emission modeling activities is developing. Is this the appropriate split of resources?

6. How should IERL-RTP and EPA-HQ work together in preparation of the FY85 Supplement and FY86 budgets? What position should be taken with DOE on negotiation of the Task Group B budget?

Outlook

Emissions Inventories

- o FY85 funding will focus on supporting the Eulerian atmospheric model by developing an emissions data base which will incorporate improvements in emission factor accuracy and refinements in spatial and temporal allocation factors.

- o Historical emission inventory and policy analysis activities will also be supported as priorities and funding permit.

Emissions/Economic Forecast Models

- o An initial version of the national level AUSM will be available for final testing, validation, and refinement.

- o Work on the industrial NO_x/SO_x and VOC emissions models will receive increased emphasis and attention as these models become available for testing and assessment activities.

Control Technology Assessments

- o With the initial funding for FY85 for Task Group H, work will be initiated to develop engineering cost and performance data for existing state-of-the-art and emerging advanced control technologies.

- o Work will also be undertaken, within funding constraints, to define the potential role of coal cleaning in future acid deposition control strategies.

Other

- o The "Emissions, Costs, and Engineering" activities under the US/Canadian MOI will continue to be supported to the extent required.

- o EPA policy assessments on control strategies and on control technology capabilities and limitations will occur with high priority action items and limited time periods for response.

- o Administrative support to NAPAP activities will continue to require a high degree of management attention.