

February 16, 1993

Quarterly Report Period October-December 1992

CONTRACT TITLE AND NUMBER:

SOXAL Combined SO_x/NO_x Flue Gas Control Demonstration

DE AC 22-91 PC 91347

Contractor Name: AQUATECH Systems
 7 Powder Horn Drive
 Warren, NJ 07059-5191

Contract Period: 9-10-91 - 7-1-93

1. Contract Objective: No Change

Summary of Work

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AQUATECH Systems a business unit of Allied-Signal Inc., proposes to demonstrate the technical viability and cost effectiveness of the SOXAL process a combined SO_x/NO_x control process on a 2-3 MW equivalent flue gas slip stream from Niagara Mohawk Power Corporation, Dunkirk Steam Station Boiler #4, a coal fired boiler. The SOXAL process combines 90+% sulfur dioxide removal from the flue gas using a sodium based scrubbing solution and regeneration of the spent scrubbing liquor using AQUATECH Systems' proprietary bipolar membrane technology. This regeneration step recovers a stream of sulfur dioxide suitable for subsequent processing to salable sulfur or sulfuric acid.

Additionally 90+% control of NO_x gases can be achieved in combination with conventional urea/methanol injection of NO₂ gas into the duct. The SOXAL process is applicable to both utility and industrial scale boilers using either high or low sulfur coal.

The SOXAL demonstration Program began September 10, 1991 and is approximately 22 months in duration.

During the 6 months of scheduled operations period, expected to begin January 1992, data will be collected from the SOXAL system to define:

MASTER

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- 1) SO₂ and NO_x control efficiencies
- 2) Current efficiency for the regeneration unit.
- 3) Sulfate oxidation in the absorber.
- 4) Make-up reagent rates.
- 5) Product quality including concentrations and compositions.
- 6) System integration and control philosophy
- 7) Membrane stability and performance with respect to foulants.

A conceptual design for a commercial unit as well as estimated costs will be prepared as part of the final report. The program is expected to be concluded by September 1993.

Technical Approach Changes: No Change

Contract (by reporting element):

Task 1: Program Definition - Complete

Task 2: Engineering, Design and construction

Subtask 2.1: Engineering, Design and contracting

- Complete

Subtask 2.2: Procurement, Fabrication & Detail Design

95% Complete

Purchase Orders for the NO₂ injection system have been prepared.

Subtask 3.2: Parametric Tests

Parametric testing is scheduled to begin on January 6, 1993. Niagara Mohawk has a scheduled outage on Unit 4 between March 6 to April 7, 1993.

Clifford M. Denker
Program Manager

CMD:jrh

Attachments: Milestone Schedule - December 1992

U.S. DEPARTMENT OF ENERGY
MILESTONE SCHEDULE □ PLAN ■ STATUS REPORT

DOE F1332.3 (substitute)

1. TITLE	Combined SOx/NOx Control via SOXAL™ Process: Electrodialytic Regenerative Wet-Scrubbing Process	2. REPORTING PERIOD	3. IDENTIFICATION NUMBER
		December 1992	DE AC 2291 PC 91347
4. PARTICIPANT NAME AND ADDRESS	Affed-Signal Inc., AQUATECH Systems 7 Powder Horn Drive Warren, NJ 07059-5191	5. START DATE	September 10, 1991
		6. COMPLETION DATE	September 1993
		Page 1 of 4	
7. ELEMENT	8. REPORT- ING ELEMENT	9. DURATION	10. PERCENT COMPLETE
		Fiscal Year 1993	Fiscal Year 1995
		1992 1993	1995
		O N D J F M A M J A S O N D Q1 Q2 Q3 Q4	Q1 Q2 Q3 Q4
1.1	Cost Management Plan		
1.2	Test Plan/Design Basis		
2.1	Engineering Contract		
2.2	Procurement		
2.3	Site Work		
2.4	Installation		
3.1	Shakedown		
3.2	Parametric Test		
3.3	Disassembly		
4.1	Conceptual Design		
4.2	Economic Analysis		

11. SIGNATURE OF PARTICIPANT'S PROJECT MANAGER AND DATE: Mr. A. J. T. - 1-17-93