State of California
AIR RESOURCES BOARD

Resolution 02-26
July 26, 2002

Agenda Item No.: 02-6-5

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705;

WHEREAS, a proposal, number 02-30, entitled “Demonstration of the Ultralow NOx Burner in a Firetube Boiler”, has been submitted by S. T. Johnson Company, Inc., in response to the 2002 Innovative Clean Air Technologies (ICAT) Program solicitation;

WHEREAS, the proposal has been independently reviewed for technical and business merit by highly qualified individuals; and

WHEREAS, the Research Division staff and the Executive Officer and Deputy Executive Officers have reviewed and recommend for funding:

> Proposal Number 02-30, entitled “Demonstration of the Ultralow NOx Burner in a Firetube Boiler”, submitted by S. T. Johnson Company, Inc., for a total amount not to exceed $132,526.

NOW, THEREFORE BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby approves the following:

> Proposal Number 02-30, entitled “Demonstration of the Ultralow NOx Burner in a Firetube Boiler”, submitted by S. T. Johnson Company, Inc., for a total amount not to exceed $132,526.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and agreements for the efforts proposed herein, and as described in Attachment A, in an amount not to exceed $132,526.

I hereby certify that the above is a true and correct copy of Resolution 02-26, as adopted by the Air Resources Board.

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Stacey Dorais, Clerk of the Board

ATTACHMENT A

Innovative Clean Air Technologies (ICAT) Grant Proposal:

Demonstration of the Ultralow NOx Burner in a Firetube Boiler

Background

In 1999, Altex Technologies Corporation, with Gordon Piatt Energy Group (GPEG) as a funding partner, obtained an ICAT contract to develop a low-oxides of nitrogen (NOx) burner technology. ARB staff amended that contract to make GPEG the contractor because of its planned commercialization role. Under the contract, GPEG successfully tested a production prototype of the burner. However, GPEG was sold to John Zink Co., which dropped the project without completing the contract with a field demonstration.

S. T. Johnson, a California manufacturer of boiler burners, has agreed to perform the rest of the project. However, the original contract period has expired. If granted a restoration of the unexpended funds from the original ICAT contract, S. T. Johnson and Altex would perform the field demonstration (final phase) of the original project.

Objective

This project would demonstrate an ultra-low-NOx burner (ULNB) on a boiler. All other low-NOx burners in this application use a single flame zone, near pre-mixing, and/or massive flue gas recirculation. These techniques entail poor operability, inefficiency, and high capital and operating costs. The ULNB should achieve very low NOx with good performance and minimized flue gas recirculation and its associated costs.

Methods

To demonstrate the ULNB, a production prototype version will be tested in the field in a boiler that produces 21 million British thermal units per hour (21MM Btu/hr). S. T. Johnson will demonstrate the performance, durability, and serviceability of the ULNB. Also, economic analyses will be performed to quantify the costs and benefits of the ULNB in boiler applications.

Expected Results

On the basis of a successful demonstration, S.T. Johnson will create a plan to commercialize the ULNB. The first sales of the burner are expected within 4 months of the end of the demonstration.

Significance to the Board

Commercialization of the ULNB burner would reduce the cost of NOx control in boilers and enable flue gas concentrations of NOx below what is usually required as BACT.

Applicant: S. T. Johnson Co.

Project Period: 6 months

Principal Investigator: Dan L. Wiedeman

ICAT Funding: $132,526

Co-funding:

S.T. Johnson -- $28,860

Penny Newman Milling Co. -- $127,141

Past Experience with This Principal Investigator

Staff has no prior experience with S.T. Johnson. However, the extent of review of the ICAT proposal provides an adequate basis for recommending a grant. The application was reviewed externally by academic engineers and scientists, other agencies, and academic business reviewers, and internally by the Stationary Source Division, Research Division, and the Executive Office.

Prior ICAT Funding

	2001	2000	1999
S. T. Johnson	0	0	0
Gordon Piatt Energy Group	0	0	$217,136*

* Funds expended from original grant of $349,663

B U D G E T S U M M A R Y

S. T. Johnson Co.

Demonstration of the Ultralow NOx Burner in a Firetube Boiler

Direct Costs and Benefits	**ICAT**	**Total**
1. Labor	$ 34,760	$ 34,760
2. Employee Fringe Benefits	$ 12,166	$ 12,166
3. Subcontractors	$ 28,485	$ 76,985
4. Equipment	$ 0	$ 0
5. Travel and Subsistence	$ 1,553	$ 1,553
6. Materials and Supplies	$ 15,498	$ 15,498
7. Other Direct Costs	$ 90	$107,591
Total, Direct	$ 92,552	$248,553
Indirect Costs		
1. Overhead	$ 39,974	$ 39,974
2. Other Indirect Costs	$ 0	$ 0
Total, Indirect	$ 39,974	$ 39,974
Total Project Cost	**$132,526**	**$288,527**