

DEVELOPMENT OF AN ULTRA-SAFE RECHARGEABLE LITHIUM-ION BATTERY



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DTIC TAB	<input type="checkbox"/>
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Justification _____	
By _____	
Distribution / _____	
Availability Codes	
Dist	Avail and/or Special
<i>A-1</i>	

Contract # N00014-94-C-0141
ARPA Order # 9332004arp01/13 APR 1994/313ES

R & D Status Report #2

Reporting Period: 16th November to 15th December, 1994

Submitted by:

The Electrofuel Manufacturing Company Inc.

DTIC QUALITY INSPECTED 3

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DISTRIBUTION STATEMENT A

Approved for public release;
Distribution Unlimited



OFFICE OF THE UNDER SECRETARY OF DEFENSE (ACQUISITION)
DEFENSE TECHNICAL INFORMATION CENTER
CAMERON STATION
ALEXANDRIA, VIRGINIA 22304-6145

Feb 1, 1995

IN REPLY
REFER TO

DTIC-OCC

SUBJECT: Distribution Statements on Technical Documents

TO: Office of the Chief of Naval Research
800 north Quincy Street
Arlington, VA 22217-5000
Code 22

1. Reference: DoD Directive 5230.24, Distribution Statements on Technical Documents, 18 Mar 87.

2. The Defense Technical Information Center received the enclosed report (referenced below) which is not marked in accordance with the above reference.

R&D Status report
N00014-94-C-0141

3. We request the appropriate distribution statement be assigned and the report returned to DTIC within 5 working days.

4. Approved distribution statements are listed on the reverse of this letter. If you have any questions regarding these statements, call DTIC's Cataloging Branch, (703) 274-6837.

FOR THE ADMINISTRATOR:

1 Encl

GOPALAKRISHNAN NAIR
Chief, Cataloging Branch

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DEVELOPMENT OF AN ULTRA-SAFE RECHARGEABLE LITHIUM-ION BATTERY

R&D STATUS REPORT 1931-1002/0

ARPA Order No.: 9332004arp01/13APR1994/313ES
Program Code No.: ARPA-BAA93-32
Contractor: The Electrofuel Manufacturing Company Inc.
Contract No.: N00014-94-C-0141 Contract Amount: \$1271728.
Effective Date of Contract: August 15, 1994
Expiration Date of Contract: February 14, 1996
Principal Investigator: J.K. Jacobs
Telephone No.: (800) 388-2865
Short Title of Work: Lithium-ion Battery Development
Reporting Period: November 16, 1994 to December 15, 1994

Description of Progress:

The work continued in a number of areas, however particular focus was on two central issues:

1. Verification of bonding procedures for inter-electrode and intra-electrode bonding using a series of fluorinated vinyl copolymers as adhesives/ion-conductors. These are plasticized with organic carbonates typical of the electrolyte (eg. EC, DEC) to improve both flexibility and ion conductivity. Two procedures appear to be equally effective. These are:

- a. Coating with water based latex slurry followed by air drying and hot pressing/laminating.

- b. Solution casting, from ketone solvents, of a slurry or interlayer followed by hot air drying and "warm" laminating. Manufacturability considerations will dictate the method of choice.

2. Design of the flexible manufacturing line is further advanced than had been expected at this time, with fabrication of prototype web-handling equipment (coater, laminator, drier, and associated ancillaries) having started. Specifications of the motor/controller and gear reducer system for the web drive of the prototype battery production machine have also been completed. This step allows ordering of all major components of the flexible battery manufacturing line to proceed.

Change in Key Personnel: None

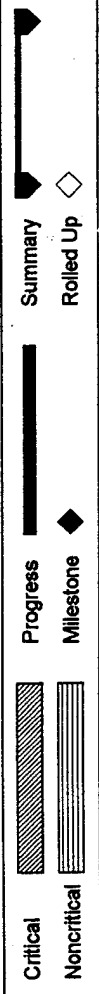
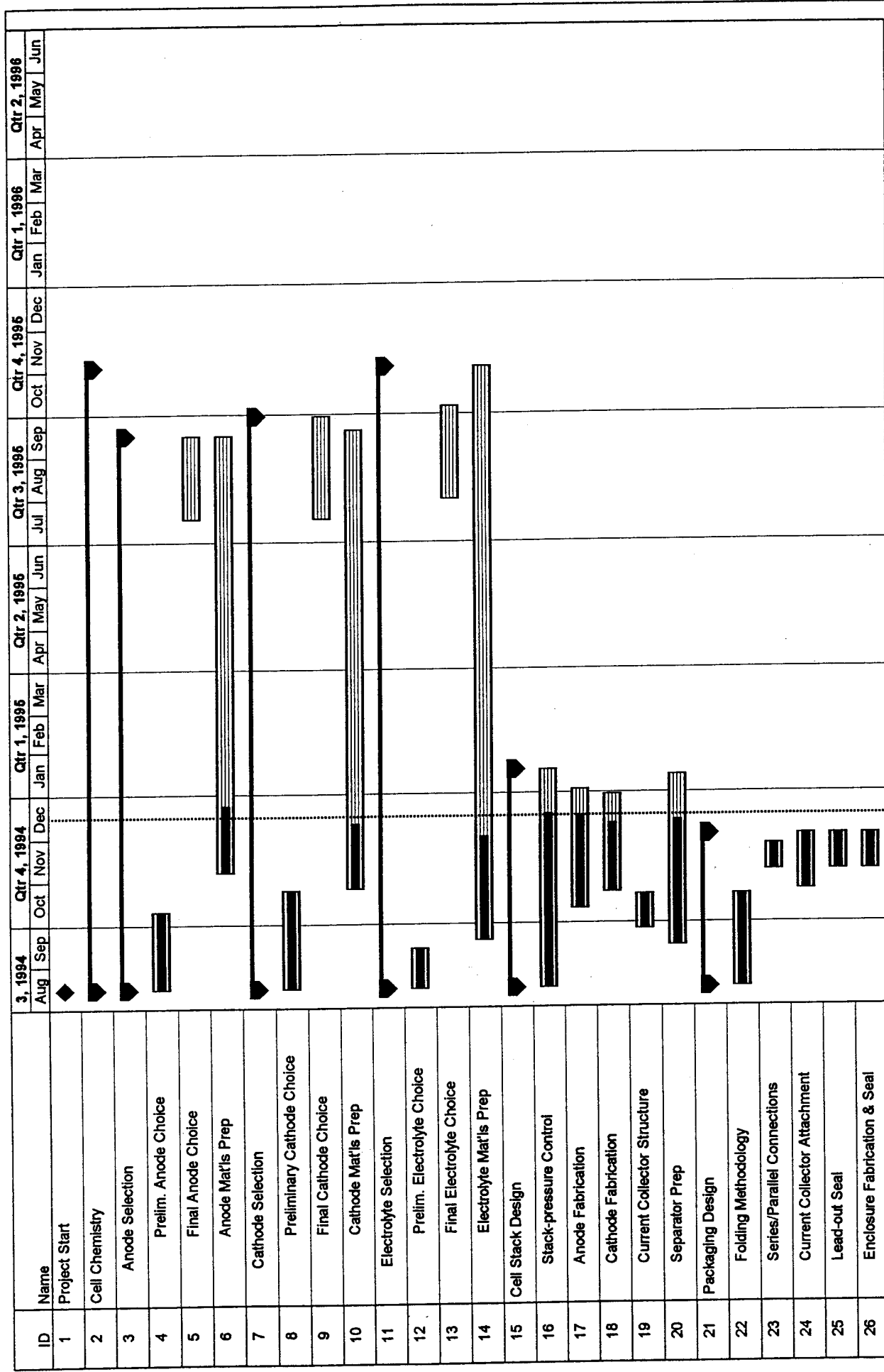
Summary of Substantive Information Derived from Special Events:
None:

Problems Encountered and/or Anticipated: None

Action Required by the Government: None

Fiscal Status:

	Total Est- imate of Program	US Govt Funding Obliga- tion	Electro fuel Contri- bution
(1) Amt. currently provided on contract:	\$1630421	\$1271728	\$358693
(2) Expenses & commitments to date:	\$ 170419	\$ 132927	\$ 37492
(3) Funds required to complete work:	\$1460002	\$1138801	\$321201



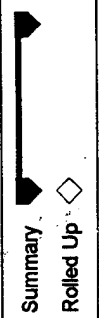
Project: LI-ion Battery
Date: 12/23/94

ID	Name	3, 1994			Qtr 4, 1994			Qtr 1, 1995			Qtr 2, 1995			Qtr 3, 1995			Qtr 4, 1995			Qtr 1, 1996			Qtr 2, 1996			
		Aug	Sep	Oct	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
27	Charger Design																									
28	Safety Requirements Review																									
29	Safety Protection Design																									
30	Equalization																									
31	Rate Control																									
32	User-group Input																									
33	User Input - part I																									
34	User Input - part II																									
35	User Input - part III																									
36	Flexible Manufacturing Line Design																									
37	Prototype Equipment Design																									
38	Pilot Equipment Design																									
39	Misc. Unit Op.'s Equip. Design																									
40	Flexible Manufacturing Line Setup																									
41	Prototype Line Setup																									
42	Pilot Line Setup																									
43	Battery Fabrication																									
44	Button Cell																									
45	Hand-crafted Cell																									
46	Prototype Battery A: Credit Card																									
47	Prototype Battery B: Lap Top																									
48	Prototype Battery C: B5590																									
49	Battery Testing																									
50	Button Cell Performance																									
51	Hand-crafted Performance																									
52	Prototype Safety																									

 Critical
 Progress
 Milestone
 Summary
 Rolled Up

Project: Li-Ion Battery
 Date: 12/23/94

ID	Name	3, 1994			Qtr 4, 1994			Qtr 1, 1995			Qtr 2, 1995			Qtr 3, 1995			Qtr 4, 1995			Qtr 1, 1996			Qtr 2, 1996		
		Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
53	Prototype Performance																								
54	Reporting																								
55	Progress																								
56	Built Cell Report																								
57	Prototype Battery Test Report																								
58	Final Report																								
59	Project Complete																								



Project: Li-Ion Battery
Date: 12/23/94