

coverage of the rule or any part thereof for small entities.

19. The objective in the *Refarming* proceeding was to provide a means to transition licensees to 6.25 kHz technology. Migration to 12.5 kHz technology was viewed as a stepping stone to operation at 6.25 kHz technology. However, requiring the use of 6.25 kHz technology by a date certain could impact some small entities requiring them to upgrade their communications systems before they would otherwise do so. An alternative would be to maintain the current rules, which are intended to foster migration to narrowband technology by way of progressively more stringent type certification requirements. We issue this *3rd Further NPRM* to stay the effectiveness of § 90.203(j)(5) of the Commission's rules and thereby ensure that a January 1, 2005 deadline would not injure any party while we consider whether a change in the Commission's rules would benefit small entities and other PLMR licensees.

Federal Rules That May Duplicate, Overlap, or Conflict With the Proposed Rules

None.

III. Ordering Clauses

20. Pursuant to sections 1, 2, 4(i), 301, 302, and 303 of the Communications Act of 1934, as amended, 47 U.S.C. 151, 152, 154(i), 301, 302, and 303, and §§ 1.421 and 1.425 of the Commission's rules, 47 CFR 1.421 and 1.425, it is ordered that the *Third Further Notice of Proposed Rule Making* is hereby adopted.

21. It is further ordered that the Commission's Consumer Information Bureau, Reference Information Center, shall send a copy of this *Third Memorandum Opinion and Order, Third Further Notice of Proposed Rule Making* including the Initial Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the U.S. Small Business Administration.

List of Subjects in 47 CFR Part 90

Communications equipment, Radio, Reporting and recordkeeping requirements.

Federal Communications Commission.

Marlene H. Dortch,

Secretary.

[FR Doc. 05-11476 Filed 6-14-05; 8:45 am]

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DEPARTMENT OF TRANSPORTATION

Pipeline and Hazardous Materials Safety Administration

49 CFR Parts 171, 172, 173, and 175

[Docket No. PHMSA-02-11989 (HM-224C)]

RIN 2137-AD48

Hazardous Materials; Transportation of Lithium Batteries

AGENCY: Pipeline and Hazardous Materials Safety Administration (PHMSA), DOT.

ACTION: Initial regulatory flexibility analysis.

SUMMARY: The Pipeline and Hazardous Materials Safety Administration (PHMSA) is publishing this initial regulatory flexibility analysis to aid the public in commenting upon the potential small business impacts of the proposals in our April 2, 2002 notice of proposed rulemaking to amend the requirements in the Hazardous Materials Regulations (HMR) on: (1) Exceptions for "small" and for "mid-size" batteries (*i.e.*, cells up to 5 grams of lithium content and batteries up to 25 grams of lithium content); and (2) exceptions for aircraft passengers and crew. These changes are being proposed in order to clarify requirements to promote safer transportation practices; promote compliance and enforcement; eliminate unnecessary regulatory requirements; facilitate international commerce; and make these requirements easier to understand. We will consider comments received to improve our regulatory flexibility analysis and in making our decision on a final rule.

DATES: Written comments must be received on or before August 1, 2005.

ADDRESSES: You may submit comments (identified by DOT DMS Docket Number PHMSA-02-11989 (HM-224C)) by any of the following methods:

- Web site: <http://dms.dot.gov>.

Follow the instructions for submitting comments on the DOT electronic docket site.

- Fax: 202-493-2251.

- Mail: Docket Management Facility; U.S. Department of Transportation, 400 Seventh Street, SW., Nassif Building, PL-401, Washington, DC 20590-0001.

- Hand Delivery: Room PL-401 on the plaza level of the Nassif Building, 400 Seventh Street, SW., Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

- Federal eRulemaking Portal: Go to <http://www.regulations.gov>. Follow the online instructions for submitting comments.

Instructions: You must include the agency name (Pipeline and Hazardous Materials Safety Administration) and the Docket number (PHMSA-02-11989 (HM-224C)) or the Regulatory Identification Number (RIN 2137-AD48) for this rulemaking at the beginning of your comments. You should submit two copies of your comments if you submit them by mail. If you wish to receive confirmation that PHMSA received your comments, you must include a self-addressed stamped postcard. Note that all comments received will be posted, without change, to <http://dms.dot.gov> including any personal information provided and will be available to internet users. Please see the Privacy Act section of this document.

Docket: For access to the docket to read background documents and comments received, go to <http://dms.dot.gov> at any time or to Room PL-401 on the plaza level of the Nassif Building, 400 Seventh Street, SW., Washington, DC between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

FOR FURTHER INFORMATION CONTACT: John Gale, Office of Hazardous Materials Standards, PHMSA, Department of Transportation, 400 Seventh St., SW., Washington, DC 20590-0001, Telephone (202) 366-8553.

SUPPLEMENTARY INFORMATION: In our April 2, 2002 notice of proposed rulemaking (NPRM) under this docket (67 FR 15510), the Research and Special Programs Administration (RSPA)—PHMSA's predecessor agency—explained that lithium batteries and equipment containing or packed with lithium batteries are regulated as Class 9 materials unless they meet an exception in the Hazardous materials Regulations (HMR, 49 CFR Parts 171-180). In that NPRM, RSPA proposed (1) changes to test methods for lithium batteries, (2) that excepted "small" batteries must be tested and each package containing more than 24 cells or 12 batteries must meet packaging standards, including a maximum gross mass, and have certain communication of the hazards (marking and accompanying documentation), (3) elimination of the exception for "mid-size" cells and batteries, and (4) exceptions for airline passengers and crew members to carry consumer electronic devices and spare batteries aboard aircraft, subject to limits on the lithium content and number of spare batteries.

Our April 2, 2002 NPRM did not include an initial regulatory flexibility analysis (IRFA) pursuant to the Regulatory Flexibility Act (5 U.S.C. 603)

because we concluded that the proposed changes would not have a significant economic impact on a substantial number of small entities (5 U.S.C. 605). We concluded that the costs associated with testing “small” lithium batteries would be incurred by lithium battery manufacturers, which are not small businesses. We also concluded that most small businesses that offer lithium batteries for transportation would make smaller shipments (fewer than 24 cells or 12 batteries) of “small” batteries and would not have to meet the packaging and hazard communication requirements.

Comments to the proposed rule indicated that some lithium battery manufacturers are small businesses and that the small shipment exception may not sufficiently mitigate their burden. On August 22, 2003, the Office of Management and Budget returned RSPA’s draft final rule in this proceeding stating that, after discussions with the Small Business Administration, it believed that a full IRFA should be prepared containing “additional information that will allow RSPA to more fully address comments disputing the need for regulating lithium ion batteries,” with “as much detail as possible on their cost estimates,” and also to “gather additional information on the number of small businesses impacted and their annual revenues.” Thereafter, RSPA performed a threshold analysis and determined that at least 52 small businesses could be affected by the proposed rule and that this number could increase as the market for lithium batteries and cells increases. Based on the threshold analysis we concluded that this IRFA was required because the proposed rule may have significant economic impact on a substantial number of small businesses.

In an interim final rule (IFR) published December 15, 2004, under Docket No. PHMSA–04–19886 (HM–224E, 69 FR 75208), we amended the

HMR to (1) prohibit the transportation of primary (non-rechargeable) lithium batteries and cells as cargo aboard passenger-carrying aircraft, (2) adopt conditions under which equipment containing or packed with primary lithium batteries and cells may be transported aboard passenger-carrying aircraft, and (3) require that packages of small and mid-size primary lithium batteries and cells (that are excepted from Class 9) must be marked “Primary Lithium Batteries—Forbidden for Transport Aboard Passenger Aircraft” when transported by highway, rail, vessel, or cargo aircraft. The IFR also provides that lithium batteries are not eligible for the “small quantity” exception in 49 CFR 173.4, but that airline passengers and crew members may carry consumer electronic and medical devices containing lithium cells or batteries, and spare batteries, in their carry-on or checked baggage, up to a maximum lithium content of each cell and each battery. The prohibition and restrictions adopted in this IFR apply to both foreign and domestic passenger-carrying aircraft entering, leaving, or operating in the United States and to persons offering primary lithium batteries and cells for transportation on any passenger-carrying aircraft. Aside the exception for electronic devices and spare batteries in airline passenger and crew member baggage, the provisions adopted in the IFR do not apply to secondary (rechargeable) lithium batteries (e.g., lithium ion batteries).

In a separate rulemaking proceeding, the revised UN test methods for lithium batteries were adopted in the HMR. Docket No. PHMSA–04–17036 (HM–215G), 69 FR 76043 (Dec. 20, 2004). For these reasons, this IRFA does not address the changes proposed in the April 2, 2002 NPRM concerning test methods or the exception for electronic devices.

Description of the reasons that action by the agency is being considered. PHMSA believes that the current

regulations pertaining to the transportation of lithium batteries and cells are insufficient to prevent potentially serious incidents resulting from damage to these batteries and cells. The potential for fires that are difficult to extinguish from such incidents was discussed in the preamble to the proposed rule, which described two fires involving lithium batteries (67 FR 15511). Changes to the international regulations concerning the transportation of lithium batteries and cells, particularly the United Nations Recommendations on the Transport of Dangerous Goods (UN Recommendations), were adopted to address these safety issues. As a result, the HMR is now inconsistent with the UN Recommendations and, thus, makes it more difficult to transport these materials in international commerce.

Succinct statement of the objectives of, and legal basis for, the proposed rule.

The proposed rule will improve the safety of transportation of lithium batteries and cells by changing the test methods for lithium batteries, revising the exceptions for small batteries, eliminating an exception for larger batteries, adding exceptions for aircraft passengers and crew, and making editorial changes to clarify the requirements.

To further clarify and describe these changes, we have proposed to define small, mid-size, and large categories for lithium batteries and cells, as shown in Table 1, where Li means Lithium and ELC means equivalent lithium content. Equivalent lithium content means, for a lithium ion cell, the product of the rated capacity, in ampere-hours, of a lithium ion cell times 0.3. The equivalent lithium content of a battery equals the sum of the grams of equivalent lithium contents contained in the component cells of the battery.

TABLE 1.—BATTERY AND CELL CATEGORY DEFINITIONS

	Small (no more than)	Mid-size (between)	Large (more than)
Cells:			
Lithium Metal/Alloy	1 g Li	1 g and 5 g Li	5 gLi
Lithium Ion	1.5 g ELC	1.5 g and 5 g ELC	5 g ELC
Batteries:			
Lithium Metal/Alloy	2 g Li	2 g and 25 g Li	25 g Li
Lithium Ion	8 g ELC	8 g and 25 g ELC	25 g ELC

This IRFA considers the following specific changes to the HMR:

1. Revise the exception for small batteries.

a. Require testing of small batteries formerly excepted under the HMR

according to the UN Manual of Tests and Criteria.

b. When a package contains more than 24 cells or 12 batteries, except when installed in equipment, small batteries must meet the following packaging and shipping requirements:

- The package must be marked to indicate that it contains lithium batteries, and that special procedures should be followed in the event that the package is damaged;
- The package must be accompanied by a document indicating that the package contains lithium batteries and that special procedures should be followed in the event that the package is damaged;
- The package must be capable of withstanding a 1.2 meter drop test in any orientation without damage to cells or batteries contained in the package, without shifting of the contents that would allow short circuiting and without release of package contents; and

- Except in the case of lithium cells or batteries packed with or contained in equipment, in packages not exceeding 30 kilograms (gross weight).

2. Remove the exception associated with the shipment of mid-size batteries, so that these batteries and cells must be shipped as Class 9 hazardous materials. The requirement to transport mid-size batteries and cells as Class 9 hazardous materials will not subject the batteries to any additional testing; however, employees who are involved with any aspect of their transportation (including preparing shipping papers) would be now considered hazmat employees and would be subject to the applicable training requirements under the HMR. Additionally, these shipments would have to be made in UN performance-oriented packagings and marked, labeled, and described on shipping papers in accordance with the HMR.

3. Except from the HMR consumer electronic devices (watches, calculating machines, cameras, cellular phones, lap-

top computers, camcorders, etc.) brought onboard an aircraft by passengers and crew. Also except from the HMR passengers and crew carrying spare batteries for consumer electronic devices containing lithium or lithium ion cells or batteries subject to quantity and lithium content limits when carried by passengers or crew member for personal use. Each spare battery must be individually protected so as to prevent short circuits and carried in carry-on baggage only. In addition, each spare battery must not exceed the following:

- (i) For a lithium metal or lithium alloy battery, a lithium content of not more than 2 grams per battery; or
- (ii) For a lithium ion battery, an aggregate equivalent lithium content of not more than 8 grams per battery, except that up to two batteries with an aggregate equivalent lithium content of more than 8 grams but not more than 25 grams may be carried.

These changes are summarized in Table 2.

TABLE 2.—SUMMARY OF REQUIREMENTS BY BATTERY AND CELL CATEGORY

	Small	Mid-size	Large
Testing	Will be subject to UN Testing requirements	No change	
Shipping	Packages of more than 24 cells or 12 batteries (except when installed in equipment) have new integrity and communication requirements. Revise exceptions for passengers and crew for carrying consumer electronic devices and spare batteries	Now subject to HMR as Class 9 (only required old UN Tests before).	No change.

Description of and, where feasible, an estimate of the number of small entities to which the proposed rule will apply.

In recent years, the lithium battery industry has undergone a transformation from one serving a small, niche-driven market to a rapidly growing industry powering equipment in a broad range of sectors (e.g., military, manufacturing and medical), and being used in a variety of consumer electronics, including: laptop computers, communications equipment, and entertainment products. Primary or non-chargeable batteries are used to power a number of electronics and other high-tech products, including digital cameras, memory backup circuits, security devices, calculators, and watches. Rechargeable or secondary lithium ion batteries are used in laptop computers, camcorders, cell phones, and other portable electronic devices.

The proposed rule would regulate the transportation of primary and secondary

lithium batteries and cells. For this analysis, we identified 109 businesses potentially affected by the proposed rule. Of these 109 businesses, 60 were identified as small businesses based on the size standards developed by the Small Business Administration and codified in 13 CFR 121.201. These small businesses were identified using a number of sources:

1. Energy source guides at <http://energy.sourceguides.com/businesses/byP/batP/batt/btora/bType/lion/byB/mfg/byN/byName.shtml> and <http://energy.sourceguides.com/businesses/byP/batP/batt/byB/mfg/byN/byNameWeb.shtml>
2. Batteries EZ Search at http://www.industrialbatteries-ez.com/industrialbatteries/0028713_0028679_1.html
3. Portable Rechargeable Battery Association (PRBA) Member List at <http://www.prba.org/member.html>

4. Lexis-Nexis search “manufactures lithium batteries”

5. Thomas Register at <http://www.thomasregister.com/>

6. Dun & Bradstreet financial and other reports (through Westlaw)

7. Dun & Bradstreet financial and other reports (through Electronics Business on-line)

8. Hoover’s company database

9. Information Access company database

10. Reference USA

11. US business directory

12. Disclosure incorporated database

13. PR newswire

14. Mergent Inc. reports

15. Investext group

16. Corporate websites

Table 3 presents the number of small businesses impacted by the proposed rule for each industry.

TABLE 3.—NUMBER OF IMPACTED SMALL BUSINESSES BY NAICS CODE

Industries	NAICS code	Number of small businesses
Bare Printed Circuit Board Manufacturing	334412	1
Other Electronic Component Manufacturing	334419	3
Electromedical and Electrotherapeutic Apparatus Manufacturing	334510	1
Other Lighting Equipment Manufacturing	335129	1
Storage Battery Manufacturing	335911	21
Primary Battery Manufacturing	335912	8
All Other Miscellaneous Electrical Equipment and Component Manufacturing	335999	7
Surgical and Medical Instrument Manufacturing	339112	2
Surgical Appliance and Supplies Manufacturing	339113	1
Electrical Apparatus and Equipment, Wiring Supplies, and Related Equipment Merchant Wholesalers	423610	8
Other Electronic Parts and Equipment Merchant Wholesalers	423690	4
Industrial Supplies Merchant Wholesalers	423840	1
Research and Development in the Physical, Engineering, and Life Sciences	541710	2
Total		60

Approximately one-third of all small businesses identified are in NAICS 335911, Storage Battery Manufacturing. Primary Battery Manufacturing, NAICS 335912, is among the next largest categories of small businesses. Most of the businesses in these two categories are likely to have a significant portion of their business related to lithium-based products. Two of the firms that were contacted indicated that the lithium battery/cell business was a very small component of their overall business and that, while they have entered that market in anticipation of its growth, they would abandon the lithium battery/cell market if the compliance costs increased significantly.

Many of the small businesses identified in this IRFA both manufacture battery packs and distribute batteries manufactured by other companies. A total of 24 companies (40 percent) both manufacture and distribute battery packs. Battery manufacturing, as applied in this context, entails the packaging or assemblage of cells manufactured primarily from foreign sources into custom packs designed to meet specific customer demands. Of the 60 small business identified, 18 (30

percent) only manufacture batteries and 18 (30 percent) exclusively distribute batteries manufactured by other companies.

We believed that electronic equipment distributors would also be impacted by this proposed rule and contacted the Electronic Industries Alliance. However, they indicated that their industry is comprised primarily of large businesses.

The many of the small businesses impacted by this analysis described themselves as “value-added” businesses offering custom-designed batteries at relatively low-volumes to long-time military, medical, original equipment manufacturers (OEMs) and high-tech customers. Typically, the small businesses were purchasing cells from foreign sources and assembling them into packs for customers. Batteries offered by these small businesses tend to be more complex with higher quality and reliability standards, according to the respondents. These small businesses also develop computer and other consumer electronic batteries for “after-market” sales.

Table 4 stratifies the small businesses according to annual revenue. The annual revenue of the 60 small

businesses identified for this examination totals roughly \$681 million annually. There were nine small businesses contacted to examine the potential impact of the proposed rule on their operations. The annual revenue of these nine businesses impacted by the NPRM totals approximately \$217.1 million, or 31.9 percent of the total. Annual revenues among all 60 small businesses range from a low of \$100,000 to a high of \$98.7 million. As shown, 47 percent of the small businesses generate less than \$5 million in annual revenue, while 65 percent generate less than \$10 million. Of the nine small businesses contacted, the sales-weighted before-tax profit margin was approximately 21 percent. Applying the 21 percent before-tax profit margin to the annual revenue estimates noted previously generates an estimated \$145 million of before-tax profit for the small businesses affected by the proposed rule. Among the small businesses examined in this IRFA, the average before-tax profit is, therefore, estimated at \$2.4 million annually. Note, however, that these businesses do not focus entirely on the manufacturing and distribution of lithium batteries. Thus, only a fraction of these profits are attributable to lithium batteries.

TABLE 4.—SMALL BUSINESS SIZE BY ANNUAL SALES

Annual sales	Number of small businesses	Percentage of small businesses	Cumulative percentage
0–499,999	4	7	7
500,000–999,999	3	5	12
1,000,000–4,999,999	20	35	47
5,000,000–9,999,999	10	18	65
10,000,000–14,999,999	3	5	70
15,000,000–19,999,999	8	14	84
20,000,000–24,999,999	3	5	89
25,000,000–29,999,999	2	4	93
30,000,000–34,999,999	1	2	95
35,000,000–39,999,999		0	95

TABLE 4.—SMALL BUSINESS SIZE BY ANNUAL SALES—Continued

Annual sales	Number of small businesses	Percentage of small businesses	Cumulative percentage
40,000,000–44,999,999		0	95
45,000,000–49,999,999		0	95
50,000,000–54,999,999	1	2	96
55,000,000–59,999,999		0	96
60,000,000–64,999,999		0	96
65,000,000–69,999,999	1	2	98
70,000,000–74,999,999		0	98
75,000,000–79,999,999		0	98
80,000,000–84,999,999		0	98
85,000,000–89,999,999		0	98
90,000,000–94,999,999		0	98
95,000,000–99,999,999	1	2	100
Subtotal	57		
Unknown	3		
Total	60		

Table 5 stratifies the small businesses according to their number of employees. The company with the lowest number of employees had two employees and the company with the highest number had 233 employees. The majority of the small businesses (64 percent) have fewer than 50 employees and the vast majority of these businesses (85 percent) have fewer than 100 employees.

TABLE 5.—SMALL BUSINESS SIZE BY NUMBER OF EMPLOYEES

Number of employees	Number of small businesses	Percentage of small businesses	Cumulative percentage
1–10	9	15	15
11–20	13	22	37
21–30	4	7	44
31–40	7	12	56
41–50	5	8	64
51–60	2	3	68
61–70	2	3	71
71–80	4	7	78
81–90	0	0	78
91–100	4	7	85
101–110	1	2	86
111–120	0	0	86
121–130	1	2	88
131–140	0	0	88
141–150	4	7	95
151–160	2	3	98
161–170	0	0	98
171–180	0	0	98
181–190	0	0	98
191–200	0	0	98
201–210	0	0	98
211–220	0	0	98
221–230	0	0	98
231–240	1	2	100
Subtotal	59		
Unknown	1		
Total	60		

Description of the projected reporting, recordkeeping, and other compliance requirements of the proposed rule, including an estimate of the classes of small entities that will be subject to the requirement and the type of professional

skills necessary for preparation of the report or record.
 The compliance costs to small businesses subject to the provisions in the proposed rule are primarily related to testing battery and cell designs,

shipping of both prototypes and final products, and the training required for employees newly classified as hazmat employees. Each of these will be discussed separately. Additionally, we will discuss the extent to which these

additional compliance costs can be passed on to the small businesses' customers.

Testing

Based on the information presented in the NPRM, threshold analysis, regulatory evaluation and industry comments, testing requirements would be affected in the following manner.

1. The rule would remove the small battery exception to testing requirements. The following exceptions would be removed from the HMR, thus requiring that batteries falling into the categories outlined below be tested in accordance with the UN Manual of Tests and Criteria.

- Liquid cathode cell—no more than 0.5 grams of alloy per cell
- Liquid cathode battery—no more than 1 gram of lithium or lithium alloy
- Solid cathode cell—no more than 1 gram of lithium or lithium alloy per cell
- Solid cathode battery—no more than 2 grams of lithium or lithium alloy
- Lithium ion cell—no more than 1.5 grams of equivalent lithium content
- Lithium ion battery—no more than 8 grams of equivalent lithium content

2. Exceptions to the battery testing requirements would include:

- Batteries and cells that differ from a tested type by a change of no more than 0.1 gram or 20 percent by mass, whichever is greater.
- Batteries that are of a design similar to one that has been previously tested under UN standards and contain lithium content less than the original design.

3. At present, small battery and cell manufacturers and distributors are required to test all mid-size and larger

batteries according to the 8 step approach in the UN Manual of Tests and Criteria. Estimated testing costs used for this IRFA are those charged by outside testing laboratories because virtually all of the small companies send their batteries to outside laboratories. The cost to test a particular design prototype ranges from approximately \$5,000 to \$8,000. Testing cost estimates are based on input provided by one independent testing laboratory (Motorola) and contacting nine businesses. These costs do not include the costs of supplying the test batteries (up to 24 for rechargeable batteries) or the cost of shipping the prototypes to the testing lab. The primary reason for this is that the tests are already required for any cell or batteries that are shipped internationally.

The major incremental cost under the proposed regulation for the small producers of lithium batteries and cells will result from the required testing of small batteries. To determine the number of new design types requiring testing, a series of questions were posed to nine businesses. First, respondents were asked to estimate the number of total new designs that would be tested this year and how they expected this number to change in the next five years. Respondents were asked to categorize the new design types according to size (small, mid-size, large) and type (primary, rechargeable). Contacted businesses were then asked to estimate the fraction of the new design types that could potentially be considered exempt due to the following reasons: (a) They are nearly identical to existing designs (e.g., batteries and cells that differ from

a tested type by a change of no more than 0.1 gram or 20 percent by mass, whichever is greater) or (b) they will be manufactured in production runs of fewer than 100 batteries. The costs associated with testing batteries falling into these categories were excluded from the analysis.

The costs associated with testing new battery designs designated for international shipment were also excluded from the analysis. The basis of this exclusion is that lithium batteries that are manufactured within the U.S. but subsequently transported by aircraft to foreign destinations are already transported in accordance with the ICAO Technical Instructions, which have adopted the U.N. test standards. Thus, harmonization with the international standards would not impose any marginal costs on businesses engaged in the international transport of lithium batteries.

Table 6 shows the number of existing designs subject to testing over the two-year period following the effective date of the proposed rule as well as the number of new designs that would require testing over a 5-year period for the contacted businesses. As noted previously, the nine contacted small businesses comprise an estimated 31.9 percent (\$217.1 million/\$681.1 million) of all small businesses affected by the proposed rule in annual revenues. Thus, to expand these results to the entire population of small businesses, an expansion factor of 3.1 (\$681.1 million/\$217.1 million) was used to estimate the total number of designs requiring testing among all small businesses and these figures are also shown in Table 6.

TABLE 6.—ANNUAL TESTING REQUIREMENTS
[Number of battery and cell designs]

Year	Small businesses contacted				All small businesses			
	Previous designs	New designs			Previous designs	New designs		
		Small	Mid-size	Large		Small	Mid-size	Large
2004	254	115	61	2	797	360	190	5
2005	254	130	72	2	797	406	225	5
2006 .....	.....	146	84	2	.....	458	265	5
2007 .....	.....	165	100	2	.....	516	313	5
2008 .....	.....	186	118	2	.....	582	369	5

Two scenarios were developed to reflect the costs for low- and high-end estimates of \$5,000 and \$8,000 per test, respectively. The costs for these scenarios are shown in Tables 7 and 8. There are no testing costs for mid-size and large batteries because they are already required to be tested. The

production and shipping costs are the same for both estimates. The production costs assume that an average of 20 batteries is required for testing each design and that each battery produced for testing costs approximately \$50. The shipping costs were determined by averaging the FedEx Express 2-day

shipping costs for a package of 20 one-pound batteries to Motorola's Georgia testing location from New York City, Orlando, and Los Angeles. A certified packaging weighing two pounds and costing \$5 was assumed and FedEx's \$30 hazmat surcharge was included in the shipping cost estimate.

TABLE 7.—ANNUAL COSTS OF COMPLYING WITH TESTING REQUIREMENTS
[Low-end estimate]

Year	Previous designs	New designs			Production	Shipping	Total	Discounted total
		Small	Mid-size	Large				
2004	3,986,929	1,801,334	.....	.....	1,157,653	85,087	7,031,004	7,031,004
2005	3,986,929	2,030,941	.....	.....	1,203,574	88,463	7,309,907	6,831,689
2006 .....	.....	2,289,815	.....	.....	457,963	33,660	2,781,439	2,429,416
2007 .....	.....	2,581,687	.....	.....	516,337	37,951	3,135,975	2,559,889
2008 .....	.....	2,910,761	.....	.....	582,152	42,788	3,535,702	2,697,370
Total	7,973,858	11,614,539	.....	.....	3,917,679	287,949	23,794,026	21,549,368
Avg	1,594,772	2,322,908	.....	.....	783,536	57,590	4,758,805	4,309,874

TABLE 8.—ANNUAL COSTS OF COMPLYING WITH TESTING REQUIREMENTS
[High-end estimate]

Year	Previous designs	New designs			Production	Shipping	Total	Discounted total
		Small	Mid-size	Large				
2004	6,379,087	2,882,135	.....	.....	1,157,653	85,087	10,503,962	10,503,962
2005	6,379,087	3,249,506	.....	.....	1,203,574	88,463	10,920,630	10,206,196
2006 .....	.....	3,663,704	.....	.....	457,963	33,660	4,155,328	3,629,424
2007 .....	.....	4,130,698	.....	.....	516,337	37,951	4,684,987	3,824,345
2008 .....	.....	4,657,218	.....	.....	582,152	42,788	5,282,158	4,029,733
Total	12,758,173	18,583,262	.....	.....	3,917,679	287,949	35,547,064	32,193,660
Avg	2,551,635	3,716,652	.....	.....	783,536	57,590	7,109,413	6,438,732

As indicated in Table 7, the incremental cost for the low-end estimate over a five-year period for all 60 small businesses would be \$21,549,368, discounted at 7 percent per year, while the discounted average annual cost would be \$4,309,874.¹ For the high-end estimate shown in Table 8, the incremental discounted cost over a five-year period would be \$32,193,660 while the discounted average annual cost would be \$6,438,732. An average annual discounted cost over the five-year period for the averaged low- and high-end estimates would be about \$5,374,303 for the same companies.

For each company there would be an estimated incremental discounted cost of approximately \$71,831 annually for the low-end testing costs and about \$107,312 average for the discounted high-end testing costs over the five-year period. The average annual estimated discounted testing cost per company using the averaged high- and low-end costs would be approximately \$89,572.

Shipping

Currently, under 49 CFR 173.185, lithium batteries and cells are required to be shipped as Class 9 hazardous materials with certain significant exceptions. The proposed rules would

eliminate one of these exceptions, requiring mid-size batteries and cells to be shipped as Class 9 materials. In addition, new packaging integrity and communication requirements now apply to small batteries and cells shipped in packages of more than 12 batteries or 24 cells, except when installed in equipment.

To ship lithium cells and batteries as Class 9 hazardous materials, transporters must meet the following requirements:

1. Packaging: Use only packaging that meets Packing Group II performance standards. (Packing must not exceed 5 kg (gross weight) for passenger aircraft and must not exceed 35 kg (gross weight) for cargo aircraft.

2. Marking: The following markings must be applied to the packaging:

- Shipping name: Lithium batteries
 - Identification Number: UN 3090
 - Shipper's Name and Address
 - Name and address of company or individual receiving batteries
 - UN Specification Certification
3. Labeling: The Class 9 label must be used.

4. Train personnel.

5. Shipping Papers: The following information must be included on shipping papers:

- Proper shipping name, hazard class, identification number, and packing group
- Number and type of packages

• Total quantity of hazardous materials

- Page number and total number of pages
- Emergency telephone number
- Shipper's certification
- Signature (Must be legibly signed by a principal, officer, partner, or employee of the shipper or his agent)

Based on the wide-ranging cost estimates gathered from interviewing selected small businesses for the additional shipping costs for lithium batteries and cells under the proposed rules, we adopted estimates for:

(a) The increased cost to ship small batteries and cells under the proposed rules,

(b) The increased cost to ship mid-sized cells as Class 9 materials, and

(c) The increased cost to ship mid-sized batteries as Class 9 materials. These estimates were primarily developed from detailed data provided from a single small business; however, they were deemed to be reasonable average costs considering the varying estimates provided by other small businesses with somewhat lesser detail. These costs are \$0.05 for each small battery and cell, \$0.261 for each mid-sized cell, and \$0.313 for each mid-size battery.

Table 9 shows the total number of batteries and cells in normal production runs (production units) that are expected to be shipped to customers

¹ Annual costs are presented in present value terms based on a real discount rate of 7 percent as prescribed in the Office of Management and Budget Circular A-94.

and also illustrates how the final production shipping costs were determined for the base year of the analysis (2004).

TABLE 9.—PRODUCTION UNITS SHIPPED TO CUSTOMERS AND INCREMENTAL SHIPPING COSTS FOR 2004

Type	Units shipped	Incremental unit cost	Incremental cost	Adjusted incremental cost
Cells:				
Primary Lithium:				
Small	802,800	0.05	40,140	125,901
Mid-size	7,132	0.261	1,861	5,839
Large	128	0.0	0	0
Lithium Ion:				
Small	0	0.0	0	0
Mid-size	0	0.0	0	0
Batteries:				
Primary Lithium:				
Small	1,065,464	0.05	52,273	167,094
Mid-size	1,104,944	0.313	345,847	1,084,765
Large	3,744	0.0	0	0
Lithium Ion:				
Small	1,322,444	0.05	66,122	207,395
Mid-size	305,500	0.313	95,622	299,921
Total			602,866	1,890,913

Table 10 shows the total annual shipping costs for production deliveries of lithium batteries and cells to customers of the small businesses for which shipment quantities were obtained. These costs were adjusted to

reflect the costs for all 60 small businesses and then discounted using a 7 percent discount rate. The discounted costs for the five-year analysis period are \$10,916,110, which equates to a discounted annual average of

\$2,183,222 per year. On a discounted annual basis, each small business would be expected to incur \$36,387 in additional shipping costs to comply with the proposed rules.

TABLE 10.—ANNUAL INCREMENTAL SHIPPING COSTS TO CUSTOMERS

Year	Production runs		Total	Discounted total
	Incremental cost	Adjusted incremental cost		
2004	602,866	1,890,913	1,890,913	1,890,913
2005	691,466	2,168,812	2,168,812	2,026,927
2006	793,088	2,487,552	2,487,552	2,172,725
2007	909,645	2,853,137	2,853,137	2,329,010
2008	1,043,331	3,272,450	3,272,450	2,496,536
Total				10,916,110
Average Annual				2,183,222
Average Annual/Company				36,387

Training

As mentioned previously, lithium batteries and cells are now required to be shipped as a Class 9 hazardous material with certain significant exceptions. The proposed rules would eliminate one of these exceptions, requiring all mid-size batteries and cells to be shipped as Class 9 materials. One of the requirements for shipping lithium batteries and cells as a Class 9 hazardous material is that all hazmat employers must ensure that their hazmat employees receive training in general awareness of hazmat regulatory requirements, function-specific training related to the material they are handling, security awareness training and safety training including emergency

response and protective measures.

Hazmat training must:

- Take place before the employee can work with hazardous materials. Exceptions: The employee works under the direct supervision of a trained employee and the training is completed within 90 days of their hire or transfer into the job.
- Be done at least every three years for all hazmat employees. Training done by another employer can be used to meet these requirements.
- Be maintained for each employee for at least the past three years and for at least 90 days after the end of the employee's employment. This record must include:
 - The employee's name,

- The most recent training completion date,
- A description, copy or location of the training materials,
- The name and address of the person providing the training, and
- Certification that the employee has been trained and tested.

All small companies that ship lithium batteries or cells as Class 9 hazardous materials must train hazmat employees in accordance with the provisions of the HMR. Based on the data conducted for this IRFA, all of the small battery companies were assumed to be shipping some batteries as Class 9 hazmat. This means that each company currently has a cadre of hazmat-trained employees and has therefore already made a

considerable financial investment in employee training.

Two different approaches have been used by small companies to train their employees. The first approach is to hire an outside expert to visit the company periodically (perhaps every two years) and present training on current and proposed changes to the hazmat regulations. The employees who attend these sessions would typically be trained as trainers and they, in turn, would train other workers as needed. The second approach to training is for a company to select one employee as their training expert. This employee would be exposed to a periodic (every two years) specialized off-site course providing expert training in hazardous materials. The trained employee returns to their company and trains other employees by conducting a series of hazmat training sessions.

Although costs differ for the various elements of these two training

approaches, the research conducted for this IRFA indicates that the total costs to train one hazmat employee is approximately the same for both approaches. However, this analysis is focused on incremental costs represented by the need for small businesses to provide hazmat training to any additional employees needed to handle lithium batteries or cells that would newly be classified as hazmat as a result of the proposed regulations. As Table 11 shows, the estimated incremental discounted cost for training over a five-year period for all 60 small businesses would be \$72,565 while the average annual discounted cost would be about \$14,513. This cost is based on an estimated cost to train one hazmat employee of about \$352, computed as the average of the estimates from three small businesses. Considering that slightly less than one employee per company needs additional training (0.83

employees per company based on contacted businesses), the average annual cost per small business is \$242.

To illustrate the costs associated with training employees, one of the three businesses sharing detailed training cost information noted that it pays an experienced external trainer \$1,500 to teach a detailed six-hour class on the handling of hazardous materials. There are six employees in attendance, whose average pay is \$15/hour. With an average fringe benefit rate of 28.1 percent, total labor costs associated with class attendance is \$692.² A human resources manager is charged with all data entry and recordkeeping requirements associated with hazardous material training and certification. The recordkeeping cost is \$154 (\$20/hour @ 6 hours + fringe benefits). The total cost to train these six employees is \$2,346 and the average cost per employee is \$391.

TABLE 11.—ANNUAL INCREMENTAL TRAINING COSTS

Year	Employees with certification	Additional employees requiring certification	Incremental cost	Adjust. incremental cost	Discounted total
2004	376	15	5,273	12,923	12,923
2005	426	17	5,970	14,630	13,673
2006	482	19	6,759	16,563	14,467
2007	546	22	7,652	18,752	15,307
2008	618	25	8,663	21,229	16,195
Total .....	.....	.....	.....	.....	72,565
Average Annual .....	.....	.....	.....	.....	14,513
Average Annual/Company .....	.....	.....	.....	.....	242

Summary of Costs

The incremental costs incurred by small businesses to implement the regulations in the proposed rule are summarized in Tables 12 and 13.

Testing is by far the dominant added cost that would be mandated by the proposed regulation account for 66 percent of total costs in the low-end estimate and 74 percent of total costs in the high-end estimate. Shipping costs

account for 35 and 26 percent, respectively, of the total low- and high-end cost estimates. In both estimates, training costs are approximate 0.2 percent of total costs.

TABLE 12.—SUMMARY OF COSTS TO SMALL BUSINESSES

[Low-end estimate]

Year	Testing	Training	Shipping	Total	Discounted
2004	\$7,031,004	\$12,923	\$1,890,913	\$8,934,839	\$8,934,839
2005	7,309,907	14,630	2,168,812	9,465,221	8,846,001
2006	2,781,439	16,563	2,487,552	5,221,448	4,560,615
2007	3,135,975	18,752	2,853,137	5,898,286	4,814,759
2008	3,535,702	21,229	3,272,450	6,662,887	5,083,085
Total	23,794,026	84,097	12,672,863	36,182,682	32,239,299
Average Annual .....	.....	.....	.....	.....	6,447,860
Average Annual per Company .....	.....	.....	.....	.....	107,464

² Fringe benefits data based on Bureau of Labor Statistics, National Compensation Survey.

Employer Cost for Employee Compensation, Total Benefits, Private Industry All Workers.

TABLE 13.—SUMMARY OF COSTS TO SMALL BUSINESSES
[High-end estimate]

Year	Testing	Training	Shipping	Total	Discounted
2004	\$10,503,962	\$16,540	\$1,890,913	\$12,407,798	\$12,407,798
2005	10,920,630	18,971	2,168,812	13,075,943	12,220,508
2006	4,155,328	21,759	2,487,552	6,595,337	5,760,623
2007	4,684,987	24,957	2,853,137	7,447,298	6,079,214
2008	5,282,158	28,625	3,272,450	8,409,344	6,415,448
Total	35,547,064	110,853	12,672,863	47,935,720	42,883,590
Average Annual .....	.....	.....	.....	.....	8,576,718
Average Annual per Company .....	.....	.....	.....	.....	142,945

Examining the midpoint between the low- and high-end estimates, the total cost over the five-year analysis period (in current dollars) for all 60 small businesses is \$37,561,444. On an annual basis, this is \$7,512,289 and it equates to an average cost per company per year of \$125,205 in constant dollars. The average cost per company represents an arithmetic mean or the value obtained by dividing the sum of total costs by the total number of companies examined in the IRFA. Thus, the average cost estimate cannot be uncritically applied to the operations of every company operating in the lithium battery industry. The 60 small businesses examined with this IRFA encompass a broad range of operations, as evidenced by the spectrum of annual revenues presented in Table 4. The costs associated with complying with the proposed rule are primarily driven by the number of new battery designs requiring testing and the volume of shipments of newly designated Class 9 packages. Based on the responses provided by the smaller firms examined within this IRFA, the evidence suggests smaller marginal costs for these small firms due to their limited size and scale of operations. That is, smaller firms generally develop fewer new battery designs and ship fewer batteries compared to the larger firms operating within the lithium battery industry. There are exceptions to this rule, of course, and to the extent any firms regardless of size develop a larger number of new designs to meet the demands of the market place (e.g., small firms filling a high volume of custom orders), the costs associated with the new testing requirements could be greater.

As noted previously, the annual revenue of the 60 small businesses examined in this IRFA total roughly \$681 million, while estimated profits are approximately \$145 million annually. Thus, \$7.5 million in annual costs is equal to roughly 1.1 percent and

5.2 percent of annual revenues and profits, respectively.

Competitive Impacts of the Rule on Small Businesses

The question of who bears the costs associated with the proposed rule is central to the issue of industry burden. Will the costs be borne by the company or be passed along to the consumer? If battery manufacturers pass these costs along to consumers, will battery sales be adversely impacted by these costs? The term for the relationship to changes in quantity demanded in response to changes in price is known as elasticity. The price elasticity of demand for a product is equal to the change in quantity demanded divided by the change in price. Price-sensitive or elastic goods are those where an increase in price is offset by a reduction in the quantity demanded. Examples of price-elastic goods include theater tickets, fur coats, and sail boats. Thus, for each percent that the price of these items grows, there is at least a one percent decline in sales. Price-inelastic goods are those where price increases proportionally more than demand decreases. Examples of price-inelastic goods include gasoline, medical services, bread, and milk.

The proposed rule would increase the cost of production for the affected small manufacturers and distributors. A company selling a perfectly inelastic good could increase its price without adversely affecting sales, while in the case of perfectly elastic products, companies cannot pass along any of the higher costs of production without losing their customers. Because goods sold in the marketplace demonstrate a range of elasticities and some respondents indicated that costs could be passed along to consumers while others indicated that costs would be entirely absorbed by industry, the costs of the proposed regulation are likely to be borne by both producers and consumers. The actual distribution of the costs among producers and

consumers under the proposed rule is not known.

Description of any significant alternatives to the proposed rule that minimize significant economic impacts on small entities while accomplishing the agency's objectives. The proposed rule is designed to improve the safety of the transportation of lithium batteries and cells. Any alternatives to the proposed rule should result in similar safety benefits to warrant their consideration. We considered a number of possible alternatives:

1. Except batteries and cells transported by motor vehicle for the purposes of recycling from Class 9 hazmat requirements. The circumstances under which these materials would be shipped are essentially the same as those for disposal. The proposed rule provides an exception for lithium batteries and cells being transported by motor carrier for disposal as long as they are protected against short circuits and packed in a strong outer packaging conforming to the requirements of §§ 173.24 and 173.24a.

2. Provide manufacturers with four years, as opposed to two, to comply with the new testing requirements for existing small battery designs. This would ease the burden on small businesses by spreading out their compliance costs over twice the period, reducing the present value of the testing costs. This option would reduce the present value testing cost burden on the manufacturers by 2.8 percent, resulting in an average annual discounted testing costs per company from roughly \$89,572 to \$87,075.

3. Adopt a small production run exception from the testing requirements. The UN Recommendations provide for a small production run exception of 100 batteries or cells. Some small businesses felt that this number was too small to be effective and indicated that a higher number (e.g., 1000) would be more appropriate. Other companies indicated that they rarely make small production

runs. One company stated that a threshold of 100 batteries or cells would cover 75 percent of their business and that a threshold of 250 would cover 85 to 90 percent of their business.

4. Retain the current exemption from the shipping requirements for mid-size lithium ion batteries and cells. This alternative is based on the belief by some small businesses that the flammability hazard for lithium ion

batteries and cells is far lower than for lithium metal or lithium alloy batteries and cells. This alternative would reduce annualized shipping costs per company by \$5,613 annually, from \$35,391 to \$29,778, as shown in Table 14.

TABLE 14.—COST SAVINGS FROM KEEPING THE CURRENT EXEMPTION FOR MID-SIZE LITHIUM ION BATTERIES AND CELLS

Year	Total incremental cost	Adjusted incremental cost	Total	Discounted total
2004	507,244	1,590,992	1,590,992	1,590,992
2005	574,246	1,801,146	1,801,146	1,683,314
2006	650,098	2,039,060	2,039,060	1,780,994
2007	735,970	2,308,399	2,308,399	1,884,341
2008	833,184	2,613,316	2,613,316	1,993,686
Total				8,933,328
Average Annual				1,786,666
Average Annual/Company				29,778

5. Increase the lower threshold for lithium ion mid-size batteries and cells. This would result in more batteries and cells falling into the small category. These materials would have already been subject to the UN tests and would

be subject to the increased integrity and communication requirements for small batteries but would not be subject to the Class 9 shipping requirements being proposed for mid-size batteries. This would create a \$0.211 savings for cells

and a \$0.263 savings for batteries for an annualized savings of approximately \$4,717 per company, from \$35,391 to \$30,674, as shown in Table 15.

TABLE 15.—COST SAVINGS FROM A LOWER THRESHOLD FOR MID-SIZE LITHIUM ION BATTERIES

Year	Total incremental cost	Adjusted incremental cost	Total	Discounted total
2004	522,519	1,638,903	1,638,903	1,638,903
2005	591,539	1,855,385	1,855,385	1,734,005
2006	669,675	2,100,463	2,100,463	1,834,626
2007	758,133	2,377,914	2,377,914	1,941,086
2008	858,275	2,692,013	2,692,013	2,053,723
Total				9,202,343
Average Annual				1,840,468
Average Annual/Company				30,674

There are incremental differences in the properties of lithium metal or lithium alloy batteries and cells and lithium ion batteries and cells. These differences are recognized in the higher threshold limits between the small and mid-size categories for lithium ion products. Some organizations have argued that an equivalent level of safety could be maintained if the threshold between small and mid-size batteries were increased from 8 to 16 as long as the state of charge of the batteries was not more than 50 percent of the design rated capacity.³ The aggregate equivalent lithium content of lithium ion batteries and cells has increased significantly in portable consumer

products since the thresholds were established and this increase has focused more attention on those thresholds. However, a major concern with adopting thresholds tied to a state of charge is how the state of charge of a battery in transportation could be measured in the field to verify that it is in compliance with the regulations.

6. Except small, single-cell batteries from testing requirements if the cells have already passed the UN T1–T8 tests. This alternative is highly desired by those small businesses that manufacture these batteries. They argue that the characteristics of these batteries, from a safety standpoint, are essentially the same as for the component cells from which they are made. We do not have sufficient data to determine how many battery designs would be covered by this alternate exception; however several companies and the PRBA indicated that the cost implications for them would be very significant.

7. Require that small batteries be shipped as Class 9 hazmat but not require testing unless they are being shipped internationally by air. This alternative recognizes that international regulations require testing of batteries and cells that are being shipped internationally. While the incremental cost of shipping these materials as Class 9 hazmat is greater than shipping them with the increased integrity and communications requirements of the proposed rule (\$0.211 more for cells and \$0.263 more for batteries), eliminating the testing requirements would provide significant overall cost savings. This alternative would eliminate the costs associated with testing small battery designs, thus resulting in an annualized savings of \$89,537 per company. Conversely, it would increase shipping costs by roughly \$46,812 annually. The annualized net savings per company of this alternative would, therefore, be

³ Informal document presented to the 25th Session (July 5–14, 2004) of the United Nations Sub-Committee of Experts on the Transport of Dangerous Goods (TDG) by the International Electrotechnical Commission (IEC). “Changes to special provision 188 for lithium batteries: Request for comments.” UN/SCETDG/25/INF.54.

\$42,725, as compared to implementing the proposed rule in its entirety.

While it is possible that these alternatives might provide similar safety benefits to the proposed rule while reducing costs to the regulated community, PHMSA still believes, based on our current research and information, that the proposed rule offers the best approach for ensuring the safe transportation of lithium batteries and cells. PHMSA is open to consideration of these alternatives based on the comments received in response to this IRFA.

Identification, to the extent practicable, of all relevant federal rules that may duplicate, overlap, or conflict with the proposed rule. PHMSA is unaware of any duplicative, overlapping, or conflicting federal rules. As we stated above, there are international rules that address the transportation of lithium batteries and cells and this proposed rule attempts to improve the harmonization with those rules. We seek comments and information about any other rules which may be relevant to the transportation of lithium batteries and cells.

Questions for Comment to Assist Regulatory Flexibility Analysis: Please provide comment or information on any or all of the provisions in the proposed rule with regard to their impact on small entities or on the cost estimates in this interim regulatory flexibility analysis. We are particularly interested in comments concerning the following:

1. The categorization and identification of the affected small businesses. Are there additional categories of small business that would be impacted by the proposed rules? For example, are we correct that there are not a significant number of electronic equipment distributors that are small businesses?

2. The distribution of lithium batteries and cells among the three size categories. This allows proper calculation of the batteries and cells that would be subject to new testing and shipping requirements.

3. The estimated costs for testing the various battery and cell types.

4. The estimated shipping costs for both production and prototype batteries and cells, including packaging, marking, labeling, etc.

5. The estimated training costs for hazmat employees and the number of employees that would become hazmat employees as a result of this rule and its requirement that some batteries and cells currently exempt from being shipped as Class 9 hazardous materials would no longer be exempt.

6. Ways in which the rule could be modified to reduce any costs or burdens for small entities yet maintaining a consistent level of safety.

7. Any relevant Federal, State, or local rules that may duplicate, overlap, or conflict with the proposed rule.

8. Industry rules or policies that would require small entities to implement business practices that would already comply with the requirements of the proposed rule.

Issued in Washington, DC on June 8, 2005, under authority delegated in 49 CFR part 106.

Robert A. McGuire,

Associate Administrator for Hazardous Materials Safety.

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